

# SN08 OSS Guide (IP)

## Advance Feature Guide

SN08 Standard 01.07 March 2006

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# Publication History

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## March 2006

Re-release of the Standard version of this document, 01.07, for the following changes:

- clarified that PVG OMs do not report fields/registers that contain blank or no data from the MDM, per CR Q01292367.
- updated information on USP logs 398 and 399 and added new log examples, per CR Q01310725-04.

## January 2006

Re-release of the Standard version of this document, 01.06, for the following changes:

- included updated NTP references for the MSS15000/MG15000 products per CR Q01279851.
- removed obsolete DPT operational measurement information, per CR Q01211610.

## November 2005

Re-release of the Standard version of this document, 01.05, to remove references to the M3UA tool which was discontinued in SN07.

## June 2005

Re-release of the Standard version of this document, 01.04, for SN08 FVS release. The following sections have been updated since the previous Standard version:

- IEMS Functionality
- Performance Measurements

**May 2005**

Re-release of the Standard version of this document for SN08 at FVS due to churn. The following feature has been updated for clarification: A00007785, MFT Backend Security Server Integrating into IEMS.

**March 2005**

Re-release of the Standard version of this document, 01.03, for SN08 due to churn. The following features or CRs have been added since the previous Standard version, and multiple others have been updated:

- A00006269--OSSGate Password No Echo
- A00007244--GIC and GIAC Support on CICM and MG9K
- A00007253--MADN Ring Forward Support for CICM and MG9K
- A00007270--Session Server Call Processing Overload Controls
- A00007282--Configurable Threshold for Failed Login Attempts
- A00007393--Session Policy Controller
- A00007417--Ethernet link overload Control
- A00007709--MCS CD Phase 2 Support

**January 2005**

Standard release 01.02 of this document for SN08. All appropriate sections are updated for this release. The following features or CRs have been added since the Preliminary version:

- A59039138 -- (Visual) Message Waiting Indicator (V)MWI/CFX (IAC)
- A89007809--GWC-EM Support for the Internet Transparency Solution
- A00002644--Common Topology Identifier Provisioning
- A00006893--TLS Support for NGSS
- A00006979--Synchronized Backup Restore Manager
- A00007135--GWC DPT Audits and Counter Drift Prevention
- A00007268--NGSS OM Subsystem Enhancement

- A00007275--Session Server - Session/Application Mgmt Framework and Support for Multiple HTTPS connection to the Session Server through SSPFS
- A00007277--LOGs Throttling
- A00007383 - DNH Enhancements: Pilot DN Charge and Display
- A00007394--Network VCAC CallP
- A00007548--SN08 Packet Cable Electronic Surveillance
- A00007752--Universal Billing Correlation ID
- Q00720293--Change in SWREL value
- A00002512--GWC-EM Internet Transparency VCAC Provisioning
- A00007327--Media Proxy 5 and 30 minute Operational Measurements
- A00006570--CS2M Robustness enhancement - Moving SDM IP & CLI input to SSPFS
- A00006635--SESM Support for Cable Gateway Event Messaging
- A00007242--SESM support for SPC topology
- A00007300--Enable by default IPSec on All GWC Profiles
- A00007927--SAM21 Enhancements from Bell Canada
- A00004981--VCAC Provisioning Support for CICM Gateways
- A00006756--NSSwitch Implementation in IEMS
- A00006757--IEMS Secure Launch to PP8600
- A00006759--Secure Launch of MDM X11 Client Application
- A00007359--USP/USP-Compact: Log Delivery Stream to IEMS
- A00006906--SN08 Clock Sync Enhancements
- A00007074--GigE Link Maintenance
- A00007107--Media Gateway 9000 5/30 Minute Operational Measurements

- A00007263--LCI for Gigabit Ethernet
- A00008387--GLC-32 AB Card Support

**December 2004**

Preliminary release 01.01 of this document for SN08. The following sections are updated for this release:

- Mapping tables (ACTID-to-solutions; ACTID-to-OAM&P impacts)
- New or changed per release
- Feature deltas by product/network element
- Baseline information for Logs/Faults
- Baseline information for OMs/PMs
- Appendices

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## Appendices

Appendix A: Ethernet Routing Switch 8600 Performance Metrics

Appendix B: MG9000 MIB OMs

Appendix C: Multiservice Switch 15000 and MDM Alarm Logs Summary

Appendix D: USP OMs

Appendix E: MG9000 Alarms, Event Logs, Audit Logs

Appendix F: CICM Logs

Appendix G: Ethernet Routing Switch 8600 List of Traps

Appendix H: SNMP-based PM Poller

Appendix J: IEMS Fault Transparency with SDM/CBM





# About this document

## When to use this document

This document supports the SN08 release of Carrier VoIP Solutions. It provides SN08 design documents that contain Operations Support Systems (OSS) information. It also provides information on what is new and changed in SN08, related to the following areas:

- Logs/faults
- Data schema tables/MIBs
- Commands/User Interface
- Service Orders
- Office Parameters
- Operational/performance measurements (OMs/PMs)
- AMA/billing
- Software optionality control (SOC)

In addition, it provides a baseline of the Logs/Alarms and Operational Measurements (OMs)/Performance Measurements (PMs) that are available in Carrier VoIP, organized by network element.

Information in this document is believed to be accurate at the time of publication, but it is subject to change. Use of this document should be restricted to resource planning and estimating for SN08. **Do not use this document to make changes to existing software.**

## How this document is organized

This document is divided into the following sections:

- Mapping tables
  - Mapping network elements to ACTIDs to solutions
  - Mapping network elements to ACTIDs to OAM&P documentation elements
- New/changed information for SN08
  - Logs and faults
  - Data Schema/MIBs
  - Commands/User Interface
  - Service Order
  - Office Parameters
  - Operational Measurements/Performance Measurements
  - AMA/Billing
  - Software Optionality Control (SOC)
- SN08 features, organized by network element
- Baseline information
  - Logs/faults available, organized by network element
  - OMs/PMs available, organized by network element
- Appendix A: Ethernet Routing Switch 8600 Performance Metrics
- Appendix B: MG9000 MIB OMs/PMs
- Appendix C: Media Gateway 15000 and MDM Alarm Log Summary
- Appendix D: USP OMs/PMs
- Appendix E: MG9000 Alarms, Event Logs, Audit Logs
- Appendix F: CICM Logs and Alarms
- Appendix G: Ethernet Routing Switch 8600 Trap List
- Appendix H: SNMP-based PM Poller
- Appendix J: IEMS Fault Transparency with SDM/CBM

## Audience

This document is intended for Nortel Networks personnel, third-party OSS vendors, and customers who need to plan resources and estimate network impacts for this release.

## How to check the version and issue of this document

The document release information on the title page and the footers of this document indicate the version and issue, for example, 01.01.

The first two digits indicate the version. The version number increases each time the document is updated to support a new software release. For example, the first release of a document is 01.01. In the next software release cycle, the first release of the same document is 02.01.

The second two digits indicate the issue. The issue number increases each time a document is revised but re-released in the same software release cycle. For example, the second release of a document in the same software release cycle would be 01.02.

## Writing conventions

Descriptions of commands, parameters, and responses in this document use the following conventions:

### Input prompt

An input prompt (> or #) indicates that the information that follows is a command:

>LIST

### Commands and fixed parameters

Commands and fixed parameters that are entered at the MAP terminal are shown in uppercase letters:

>LIST ALL

### Variables

Variables that are entered at a MAP terminal are shown in lowercase letters:

>TABLE table\_name

## References in this document

This document may refer to the following Nortel Networks publications:

- 297-8001-840, *NA DMS-100 Log Report Reference Manual*
- 297-2621-840, *DMS-250 Logs Reference Manual*
- 297-5051-840, *SDM Log Report Reference Manual*
- NN10021-111, *cCS 2000 Product and Technology Fundamentals*
- NN10408-900, *ATM/IP Solution-level Fault Management*
- NN10409-500, *ATM/IP Solution-level Configuration Management*

- NN10401-700, *ATM/IP Solution-level Performance Management*
- NN10081-911, *SDM Fault Management*
- NN10103-511, *SDM Configuration Management*
- NN10147-711, *SDM Performance Management*
- NN10334-911, *Integrated EMS Fault Management*
- NN10330-511, *Integrated EMS Configuration Management*
- NN10327-711, *Integrated EMS Performance Management*
- NN10324-509, *Carrier Voice over IP Operational Configuration: Data Schema Reference*
- NN10264-709, *Carrier VoIP Performance Management Operational Measurements Reference*
- NN10025-111, *SAM21 Product and Technology Fundamentals*
- NN10089-911, *SAM21 Fault Management*
- NN10111-511, *SAM21 Configuration Management*
- NN10155-711, *SAM21 Performance Management*
- NN10083-911, *CS 2000 Fault Management*
- NN10188-511, *CS 2000 Configuration Management*
- NN10149-711, *CS 2000 Performance Management*
- NN10275-909, *Carrier Voice over IP Fault Management: Logs Reference*
- NN10090-911, *GWC Fault Management*
- NN10012-111, *SPM Product and Technology Fundamentals*
- NN10075-911, *SPM Fault Management*
- NN10097-511, *SPM Configuration Management*
- NN10141-711, *SPM Performance Management*
- NN10079-911, *DPT-SPM (IP) Fault Management*
- NN10078-911, *IW-SPM (IP) Fault Management*
- NN10073-911, *UAS Fault Management*
- NN10085-911, *cCS 2000 Fault Management*
- NN10082-911, *CS 2000 Core Manager Fault Management*
- NN10104-511, *CS 2000 Core Manager Configuration Management*
- NN10148-711, *CS 2000 Core Manager Performance Management*
- NN10300-100, *CS 2000 Management Tools IP Solutions Basics*
- NN10325-900, *CS 2000 Management Tools ATM/IP Fault Management*

- NN10276-500, *CS 2000 Management Tools ATM/IP Configuration Management*
- NN10149-711, *CS 2000 Performance*
- NN10088-911, *STORM Fault Management*
- NN10110-511, *STORM Configuration Management*
- NN10154-711, *STORM Performance Management*
- NN10074-911, *MG 9000 Fault Management*
- NN10096-511, *MG 9000 Configuration Management*
- NN10140-711, *MG 9000 Performance Management*
- NN10087-911, *Call Agent Fault Management*
- NN10109-511, *Call Agent Configuration Management*
- NN10153-711, *Call Agent Performance Management*
- NN10202-911, *Gateway Controller Fault Management*
- NN10205-511, *Gateway Controller Configuration Management*
- NN10208-711, *Gateway Controller Performance Management*
- NN10145-711, *DPT-SPM (IP) Performance*
- NN10144-711, *IW-SPM (IP) Performance*
- NN10137-711, *USP Performance*

In order to find information about the Multiserver Data Manager (MDM), refer to the following documents:

- 241-6001-011, *MDM Fault Management User Guide*
- 241-6001-501, *MDM Proxy Alarms Reference Guide*
- 241-6001-801, *MDM Overview*







# SN08 Feature Mapping Tables

## Introduction

This document contains advance information about differences in operations, administration, maintenance, and provisioning (OAM&P) for SN08. The purpose of this document is to provide early information about new, modified or deleted items related to the following areas:

- Faults, including logs and alarms
- Data schema tables
- Office parameters
- User interface/human-machine interface
- Operational/performance measurements
- Software optionality control (SOC)
- Service orders
- AMA/billing

## Solution Applications

Although this OSS Guide is intended for IP solutions it also covers ATM AAL2 solutions. The main difference between IP solutions and ATM AAL2 solutions is that the Media Gateways are setup to transport the bearer path using ATM AAL2 instead of IP.

The signaling functionality for both ATM AAL2 and IP solutions is the same.

## Mapping Table: Network elements-to-ACTID-to-documentation elements

This table illustrates mapping from the network elements to their related ACTIDs to documentation elements (logs/faults, data schema, office parameters, servord, alarms, user interface/HMI, OMs/PMs, AMA/billing, and SOC (Software Optionality Control)).

| SN08 Solutions |           | Documentation Elements |             |               |                |                          |         |             |             |
|----------------|-----------|------------------------|-------------|---------------|----------------|--------------------------|---------|-------------|-------------|
| PRODUCT        | ACTID     | Logs/Faults            | Data Schema | Office Params | Service Orders | Commands/User Interf/HMI | OMs/PMs | AMA/Billing | Optionality |
| CS 2000        | A59039138 |                        | X           |               |                |                          |         |             |             |
| CS 2000        | A89007809 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00002644 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00004741 |                        |             |               |                |                          | X       |             |             |
| CS 2000        | A00005932 |                        | X           |               |                |                          |         |             |             |
| CS 2000        | A00006226 |                        | X           |               |                | X                        |         |             |             |
| CS 2000        | A00006269 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00006271 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00006693 |                        |             |               |                | X                        | X       |             |             |
| CS 2000        | A00006731 |                        | X           |               | X              |                          |         |             |             |
| CS 2000        | A00006780 |                        |             | X             |                | X                        | X       |             |             |
| CS 2000        | A00006893 | X                      |             |               |                | X                        |         |             |             |
| CS 2000        | A00006979 | X                      |             |               |                | X                        |         |             |             |
| CS 2000        | A00007024 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00007071 | X                      | X           |               |                | X                        |         |             |             |
| CS 2000        | A00007120 | X                      | X           |               |                |                          | X       |             |             |
| CS 2000        | A00007121 | X                      |             |               |                | X                        |         |             |             |
| CS 2000        | A00007135 |                        |             |               |                |                          | X       |             |             |
| CS 2000        | A00007196 |                        | X           |               |                | X                        | X       |             |             |
| CS 2000        | A00007250 |                        | X           |               |                |                          |         |             |             |
| CS 2000        | A00007268 |                        |             |               |                |                          | X       |             |             |
| CS 2000        | A00007270 | X                      |             |               |                |                          | X       |             |             |
| CS 2000        | A00007275 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00007277 |                        | X           |               |                |                          |         |             |             |
| CS 2000        | A00007282 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00007383 |                        | X           |               |                |                          |         |             | X           |
| CS 2000        | A00007393 | X                      |             |               |                |                          | X       |             |             |
| CS 2000        | A00007394 |                        |             |               |                | X                        |         |             |             |
| CS 2000        | A00007404 |                        |             |               |                | X                        |         |             |             |

| SN08 Solutions      |           | Documentation Elements |             |             |                |                          |         |             |             |
|---------------------|-----------|------------------------|-------------|-------------|----------------|--------------------------|---------|-------------|-------------|
| PRODUCT             | ACTID     | Logs/Faults            | Data Schema | Office Parm | Service Orders | Commands/User Interf/HMI | OMs/PMs | AMA/Billing | Optionality |
| CS 2000             | A00007417 | X                      |             |             |                |                          |         |             |             |
| CS 2000             | A00007424 | X                      |             |             |                |                          |         |             |             |
| CS 2000             | A00007464 |                        | X           |             |                | X                        |         |             |             |
| CS 2000             | A00007465 | X                      |             |             |                | X                        | X       |             |             |
| CS 2000             | A00007483 |                        |             |             |                | X                        |         |             |             |
| CS 2000             | A00007489 | X                      |             |             |                | X                        |         |             |             |
| CS 2000             | A00007491 | X                      |             |             |                |                          |         |             |             |
| CS 2000             | A00007492 |                        |             |             |                | X                        |         |             |             |
| CS 2000             | A00007548 | X                      |             |             |                | X                        |         |             | X           |
| CS 2000             | A00007602 | X                      |             |             |                | X                        | X       |             |             |
| CS 2000             | A00007635 | X                      |             |             |                |                          |         |             |             |
| CS 2000             | A00007709 |                        |             |             |                |                          |         |             | X           |
| CS 2000             | A00007752 |                        | X           |             |                |                          |         |             |             |
| CS 2000             | A00007790 |                        | X           |             |                |                          |         |             |             |
| CS 2000             | A00007934 |                        | X           |             |                |                          |         |             | X           |
| CS 20000            | A00008350 |                        |             |             |                |                          | X       |             |             |
| CS 2000             | A89007819 | X                      |             |             |                | X                        |         |             |             |
| CS 20000            | Q00720293 |                        |             | X           |                |                          |         |             |             |
| CS 20000 Compact    | A00008431 | X                      |             |             |                | X                        |         |             |             |
| CS 2000-GWC         | A00002512 |                        |             |             |                | X                        |         |             |             |
| CS 2000-GWC         | A00007101 |                        |             |             |                | X                        |         |             |             |
| CS 2000-GWC         | A00007102 | X                      |             |             |                | X                        |         |             |             |
| CS 2000-GWC         | A00007113 | X                      |             |             |                |                          |         |             |             |
| CS 2000-GWC         | A00007327 | X                      |             |             |                |                          | X       |             |             |
| CS 2000 Mgmnt Tools | A00006269 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00006570 |                        | X           |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00006635 |                        | X           |             |                |                          |         |             |             |
| CS 2000 Mgmnt Tools | A00007007 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00007072 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00007242 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00007300 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00007564 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00007927 |                        |             |             |                | X                        |         |             |             |
| CS 2000 Mgmnt Tools | A00008338 | X                      |             |             |                |                          |         |             |             |
| CS 2000-TOPS        | A00007271 | X                      | X           | X           |                |                          | X       |             |             |
| CS 2000-TOPS        | A00007713 | X                      |             |             |                | X                        |         |             |             |

| SN08 Solutions     |            | Documentation Elements |             |              |                |                          |         |             |             |
|--------------------|------------|------------------------|-------------|--------------|----------------|--------------------------|---------|-------------|-------------|
| PRODUCT            | ACTID      | Logs/Faults            | Data Schema | Office Parns | Service Orders | Commands/User Interf/HMI | OMs/PMs | AMA/Billing | Optionality |
| CICM               | A00003953  | X                      |             |              |                |                          |         |             |             |
| CICM               | A00004981  |                        |             |              |                | X                        |         |             |             |
| CICM               | A00007244  |                        |             |              | X              |                          |         |             |             |
| CICM               | A00007253  |                        |             |              | X              |                          |         |             |             |
| IEMS               | A00006756  |                        | X           |              |                | X                        |         |             |             |
| IEMS               | A00006757  | X                      |             |              |                | X                        |         |             |             |
| IEMS               | A00006759  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007302  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007304  | X                      |             |              |                | X                        |         |             |             |
| IEMS               | A00007341  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007343  | X                      |             |              |                |                          |         |             |             |
| IEMS               | A00007344  |                        |             |              |                |                          | X       |             |             |
| IEMS               | A00007345  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007346  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007347  | X                      |             |              |                | X                        |         |             |             |
| IEMS               | A00007359  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007388  | X                      |             |              |                | X                        |         |             |             |
| IEMS               | A00007717  | X                      |             |              |                |                          |         |             |             |
| IEMS               | A00007785  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00007786  |                        |             |              |                | X                        |         |             |             |
| IEMS               | A00008907  | X                      |             |              |                |                          |         |             |             |
| MG 9000            | A00005561  | X                      |             |              |                | X                        |         |             |             |
| MG 9000            | A00005646  | X                      |             |              |                | X                        |         |             |             |
| MG 9000            | A00006894  |                        |             |              |                | X                        |         |             |             |
| MG 9000            | A00006906  | X                      |             |              |                |                          |         |             |             |
| MG 9000            | A00007000  | X                      |             |              |                | X                        | X       |             |             |
| MG 9000            | A00007074  |                        | X           |              |                |                          |         |             |             |
| MG 9000            | A00007107  |                        |             |              |                |                          | X       |             |             |
| MG 9000            | A00007140A | X                      |             |              |                | X                        |         |             |             |
| MG 9000            | A00007140B |                        |             |              |                | X                        |         |             |             |
| MG 9000            | A00007213  | X                      |             |              |                | X                        |         |             |             |
| MG 9000            | A00007263  |                        |             |              |                | X                        |         |             |             |
| MG 9000            | A00007293  |                        | X           |              |                |                          |         |             |             |
| MG 9000            | A00007415  | X                      | X           |              |                | X                        |         |             |             |
| MG 9000            | A00008387  |                        |             |              |                |                          |         |             |             |
| Network Patch Mgr. | A00006901  | X                      |             |              |                | X                        |         |             |             |

## Mapping Table: Network elements-to-ACTID-to-solution

This table illustrates mapping connections between the network elements, their related ACTIDs, and the applicable solutions.

| SN08 Solutions         |           |       |       |     |     |     |     |      |
|------------------------|-----------|-------|-------|-----|-----|-----|-----|------|
| PRODUCT or APPLICATION | ACTID     | PT-IP | UA-IP | IAW | IAC | DMS | CHS | AAL2 |
| CS 2000                | A59039138 |       |       |     | X   |     |     |      |
| CS 2000                | A89007809 |       |       | X   | X   |     |     |      |
| CS 2000                | A00002644 |       |       | X   | X   |     |     |      |
| CS 2000                | A00004741 | X     | X     |     |     |     |     |      |
| CS 2000                | A00005932 |       |       |     |     | X   |     |      |
| CS 2000                | A00006226 |       |       |     |     | X   |     |      |
| CS 2000                | A00006269 | X     |       |     |     |     |     |      |
| CS 2000                | A00006271 |       |       |     |     | X   |     |      |
| CS 2000                | A00006693 |       |       |     |     | X   |     | X    |
| CS 2000                | A00006731 |       |       |     |     | X   |     |      |
| CS 2000                | A00006780 |       | X     | X   |     |     | X   |      |
| CS 2000                | A00006893 |       | X     |     |     |     |     | X    |
| CS 2000                | A00006979 | X     | X     | X   |     |     |     | X    |
| CS 20000               | A00007024 | X     | X     |     | X   |     |     | X    |
| CS 2000                | A00007071 |       |       |     | X   |     |     |      |
| CS 2000                | A00007120 | X     |       |     |     |     |     | X    |
| CS 2000                | A00007121 | X     | X     |     |     |     |     |      |
| CS 2000                | A00007135 |       | X     |     |     |     |     |      |
| CS 20000               | A00007196 |       |       |     | X   |     |     |      |
| CS 2000                | A00007250 |       |       |     |     | X   |     |      |
| CS 2000                | A00007268 | X     |       |     |     |     |     | X    |
| CS 2000                | A00007270 | X     |       |     |     |     |     | X    |
| CS 2000                | A00007275 | X     |       |     |     |     |     |      |
| CS 2000                | A00007277 |       |       |     |     | X   |     |      |
| CS 20000               | A00007282 | X     |       |     |     |     |     | X    |
| CS 2000                | A00007383 |       |       |     |     | X   |     |      |
| CS 2000                | A00007393 |       |       |     |     |     | X   |      |
| CS 2000                | A00007394 |       |       |     |     |     | X   |      |
| CS 2000                | A00007404 |       | X     |     |     |     |     | X    |
| CS 2000                | A00007417 |       |       |     |     | X   |     |      |
| CS 2000                | A00007424 | X     | X     | X   | X   |     |     | X    |
| CS 20000               | A00007464 |       |       |     | X   | X   |     |      |
| CS 2000                | A00007465 |       |       |     | X   | X   |     |      |

| SN08 Solutions         |           |       |       |     |     |     |     |      |
|------------------------|-----------|-------|-------|-----|-----|-----|-----|------|
| PRODUCT or APPLICATION | ACTID     | PT-IP | UA-IP | IAW | IAC | DMS | CHS | AAL2 |
| CS 2000                | A00007483 |       |       |     |     | X   |     |      |
| CS 2000                | A00007489 |       |       |     |     | X   |     | X    |
| CS 2000                | A00007491 |       |       |     |     | X   |     | X    |
| CS 2000                | A00007492 |       |       |     |     | X   |     | X    |
| CS 2000                | A00007548 |       |       |     | X   |     |     |      |
| CS 2000                | A00007602 |       |       |     |     | X   |     | X    |
| CS 2000                | A00007635 | X     |       |     |     | X   |     | X    |
| CS 2000                | A00007709 |       |       |     |     | X   |     |      |
| CS 2000                | A00007752 |       |       |     |     | X   |     |      |
| CS 2000                | A00007790 | X     |       |     |     | X   |     |      |
| CS 2000                | A00007934 |       |       |     |     | X   |     | X    |
| CS 2000                | A00008350 | X     |       |     |     |     |     | X    |
| CS 2000                | A89007819 | X     |       | X   | X   |     |     |      |
| CS 2000                | Q00720293 | X     | X     | X   | X   | X   | X   |      |
| CS 2000 Compact        | A00008431 | X     | X     | X   | X   |     | X   | X    |
| CS 2000-GWC            | A00002512 |       |       | X   | X   |     |     |      |
| CS 2000-GWC            | A00007101 | X     | X     | X   |     |     | X   | X    |
| CS 2000-GWC            | A00007102 | X     | X     | X   | X   |     | X   | X    |
| CS 2000-GWC            | A00007113 | X     |       |     |     |     |     | X    |
| CS 2000-GWC            | A00007327 |       |       |     |     |     | X   |      |
| CS 2000 Mgmt Tools     | A00006269 | X     |       |     |     |     |     |      |
| CS 2000 Mgmt Tools     | A00006570 |       | X     |     |     |     |     | X    |
| CS 2000 Mgmt Tools     | A00006635 |       |       |     | X   |     |     |      |
| CS 2000 Mgmt Tools     | A00007007 |       |       |     | X   |     |     |      |
| CS 2000 Mgmt Tools     | A00007072 |       |       | X   |     |     |     |      |
| CS 2000 Mgmt Tools     | A00007242 |       |       | X   | X   |     | X   |      |
| CS 2000 Mgmt Tools     | A00007300 | X     | X     |     |     |     | X   | X    |
| CS 2000 Mgmt Tools     | A00007564 |       | X     |     |     |     |     |      |
| CS 2000 Mgmt Tools     | A00007927 |       | X     |     |     |     |     |      |
| CS 2000 Mgmt Tools     | A00008338 |       |       |     | X   |     |     |      |
| CS 2000-TOPS           | A00007271 | X     |       |     |     |     |     |      |
| CS 2000-TOPS           | A00007713 | X     |       |     |     | X   |     |      |
| CICM                   | A00003953 |       |       |     |     |     | X   |      |
| CICM                   | A00004981 |       |       | X   | X   |     |     |      |
| CICM                   | A00007244 |       | X     | X   |     |     |     |      |
| CICM                   | A00007253 |       | X     | X   |     |     |     |      |
| IEMS                   | A00006756 | X     |       |     |     |     |     |      |
| IEMS                   | A00006757 | X     |       |     |     |     |     |      |
| IEMS                   | A00006759 | X     |       |     |     |     |     |      |

| SN08 Solutions         |            |       |       |     |     |     |     |      |
|------------------------|------------|-------|-------|-----|-----|-----|-----|------|
| PRODUCT or APPLICATION | ACTID      | PT-IP | UA-IP | IAW | IAC | DMS | CHS | AAL2 |
| IEMS                   | A00007302  | X     |       |     |     |     |     | X    |
| IEMS                   | A00007304  |       | X     |     |     |     |     | X    |
| IEMS                   | A00007341  |       | X     |     |     |     |     | X    |
| IEMS                   | A00007343  |       | X     |     |     |     |     | X    |
| IEMS                   | A00007344  |       | X     |     |     |     |     |      |
| IEMS                   | A00007345  |       | X     |     |     |     |     |      |
| IEMS                   | A00007346  |       | X     |     |     |     |     |      |
| IEMS                   | A00007347  |       | X     |     |     |     |     |      |
| IEMS                   | A00007359  | X     | X     | X   | X   |     |     |      |
| IEMS                   | A00007388  |       | X     |     |     |     |     |      |
| IEMS                   | A00007717  | X     |       |     |     |     |     | X    |
| IEMS                   | A00007785  |       | X     |     |     |     |     |      |
| IEMS                   | A00007786  |       | X     |     |     |     |     |      |
| IEMS                   | A00008907  | X     |       |     |     |     |     |      |
| MG 9000                | A00005561  |       | X     |     |     |     |     |      |
| MG 9000                | A00005646  |       | X     |     |     |     |     |      |
| MG 9000                | A00006894  |       | X     |     |     |     |     |      |
| MG 9000                | A00006906  |       | X     |     |     |     |     |      |
| MG 9000                | A00007000  |       | X     |     |     |     |     |      |
| MG 9000                | A00007074  |       | X     |     |     |     |     |      |
| MG 9000                | A00007107  |       | X     |     |     |     |     |      |
| MG 9000                | A00007140A |       | X     |     |     |     |     | X    |
| MG 9000                | A00007140B |       | X     |     |     |     |     | X    |
| MG 9000                | A00007213  | X     |       |     |     |     |     |      |
| MG 9000                | A00007263  |       | X     |     |     |     |     |      |
| MG 9000                | A00007293  |       | X     |     |     |     |     |      |
| MG 9000                | A00007415  |       | X     |     |     |     |     |      |
| MG 9000                | A00008387  |       | X     |     |     |     |     |      |
| Network Patch Mgr.     | A00006901  | X     | X     |     | X   |     |     | X    |







## New or changed per release

### New or changed for SN08

This section of the document describes the feature-based changes occurring in the SN08 release for the following categories:

- Logs/alarms
- Data Schema and MIBs
- Commands
- Service order
- Office parameters
- Operational measurements (OMs) and performance measurements (PMs)
- AMA/Billing
- Software Optionality Control (SOC)

### Solutions Application

Although this OSS Guide is intended for IP solutions it also covers ATM AAL2 solutions. The main difference between IP solutions and ATM AAL2 solutions is that the Media Gateways are setup to transport the bearer path using ATM AAL2 instead of IP.

The signaling functionality for both ATM AAL2 and IP solutions is the same.

### SSH Compatibility statement

Access to some functions requires the use of SSH compatible client software for access to secure telnet and ftp services (via the SSH standard). SSH clients are supplied bundled with some operating systems, but may need to be obtained separately. Sources for SSH clients include (but are not limited to):

- PUTTY - freeware
- OpenSSH - freeware
- SSH Inc. - commercial

- Secure CRT - commercial
- WinSCP - freeware

Nortel does not supply or recommend a particular supplier.

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### Logs/faults changes overview

The following logs/faults are new or changed for SN08. They also appear in the logs-by-product tables in the Baseline section of this document with descriptions/cause for generation. This section also offers general log changes. Additional information is available in the Feature Deltas section of this document.

#### Summary of new or changed Logs/Faults for SN08

| Log/Fault Type                              | Log/Fault Name         | New/Modified/Deleted, ACTID and Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = CS 2000</b>                    |                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Transport Level Security (TLS) alarms (new) | (refer to next column) | <p>Feature A00006893 (UA-IP, PT-AAL2) creates the following alarms.</p> <ul style="list-style-type: none"> <li>• TLS connection request comes in above the connection throttle limit (and above the threshold for the alarm - the defined thresholds are: 10 for minor, 50 for major, and 100 for critical).</li> <li>• TLS connection handshake failures (the thresholds are: 1 for minor, 2 for major, and 5 for critical).</li> <li>• TLS local certificate expiration (expiry in 31 days or less - minor, 15 days or less - major, and 5 days or less - critical).</li> </ul> |

**Summary of new or changed Logs/Faults for SN08**

| Log/Fault Type  | Log/Fault Name | New/Modified/Deleted, ACTID and Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SIPS logs (new) | SIPS300        | <p>Feature A00006893 (UA-IP, PT-AAL2) creates the following logs.</p> <ul style="list-style-type: none"> <li>SIPS300 is generated during the alarming of dropped connection requests (due to either the threshold being crossed for throttling connections, or due to attempting to use TLS when TLS is not enabled). The severity of the alarm indicates the threshold that was crossed, 10 dropped connection requests in a minute for a MINOR, 50 dropped requests for a MAJOR, and 100 dropped requests (or more) for a critical. The alarm is raised for a minimum of 30 minutes.</li> <li>SIPS301 is generated during authentication failure events. The alarmd process log indicates the level of trouble (CRIT indicates a very serious problem, MINOR may be transient or the beginning of a series of authentication failures).</li> <li>SIPS302 is generated as a result of the alarm process check to ensure the Local Server certificate continues to be valid. The expiration date contained in the certificate is checked on a daily basis, and when the expiration of the certificate will occur within 31 days (MINOR), 15 days (MAJOR), or 5 days (CRIT), the alarm is raised, with this log. For certificates that have already expired, the CRIT alarm and log is generated, and authentication failures will be output for any connections that are attempted.</li> <li>SIPS305 is generated during the initialization of the Call Processing application (i.e. during the unlock). If one of these critical logs comes out, it means that there is a problem with the initialization, and the application is unable to start.</li> <li>SIPS600 is generated during the connection set up of the Call Processing application. When the 'monitor OMs' log comes out, ensure that the threshold levels set for connection throttling are reasonable for the size of the office. If the 'TLS is not enabled' message comes out, ensure that the initialization of the call processing application worked correctly.</li> </ul> |
|                 | SIPS301        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS302        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS305        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS600        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS601        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS604        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS605        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS606        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                 | SIPS607        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>             | <b>Log/Fault Name</b>                            | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (continued)<br>SIPS logs<br>(new) |                                                  | <p>(continued)<br/>Feature A00006893 (UA-IP, PT-AAL2) creates the following logs.</p> <ul style="list-style-type: none"> <li>• SIPS601 is generated during authentication failure events. This INFO log indicates the reason for the authentication failures.</li> <li>• SIPS604 is generated during the initialization of the Call Processing application (i.e. during the unlock). This log indicates when the current local certificate will expire.</li> <li>• SIPS605 is generated during the initialization of the Call Processing application (i.e. during the unlock). This log indicates that TLS has been enabled. Expect a SIPS604 log along with this log.</li> <li>• SIPS606 log is generated when there is a problem importing the trusted certificate provisioned via the web interface in the database.</li> <li>• SIPS607 log supplements the SIPS601 log. The SIPS607 is generated to provide details into which remote server is not able to connect with the local server.</li> </ul> |
| CRTM logs<br>(new)                | CRTM700<br><br>CRTM701                           | <p>Feature A00006893 (UA-IP, PT-AAL2) creates the following logs.</p> <ul style="list-style-type: none"> <li>• CRTM700 is an INFO log which indicates that the user has requested a new private key.</li> <li>• CRTM701 is an INFO log which indicates that the user selected to generate a self-signed certificate.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| BKM logs<br>(new)                 | BKM600<br><br>BKM601<br><br>class_security.ver01 | <p>Feature A00006979 (PT-IP, UA-IP, IAW) creates the following logs.</p> <ul style="list-style-type: none"> <li>• BKM600 is generated if a system backup is successful</li> <li>• BKM601 is generated if a system backup fails.</li> <li>• class_security.ver01 is generated when a user attempts to invoke the Backup Manager and does not have the correct permissions.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b> | <b>Log/Fault Name</b>         | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CMT alarms (new)      | Corrupt Certificate           | Feature A00007071 (IAW) adds new Minor alarms related to the importation and removal of certificates (profiles). <ul style="list-style-type: none"> <li>Corrupt Certificate, raised when a syntax error is recognized in a Certificate or a disallowed combination of fields is present.</li> <li>Duplicate Certificate, raised when more than one Certificate with the same name is detected in the Nortel or Third Party certificate directories.</li> <li>Delete Certificate, raised if a Certificate file is removed that has GWs associated with it.</li> <li>Certificate Changed, raised when an existing profile is changed and one or more of the fields that are changed are not allowed.</li> <li>Missing Certificate, raised when a Nortel Certificate has been removed from the Nortel directory or changed to a different name.</li> </ul> |
|                       | Duplicate Certificate         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                       | Delete Certificate            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                       | Certificate Changed           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                       | Missing Certificate           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| CMT logs (new)        | Corrupt Certificate Alarm log | Feature A00007071 (IAW) adds new Minor alarms related to the importation and removal of certificates (profiles). <ul style="list-style-type: none"> <li>The log lists additional detail for the Corrupt Certificate alarm.</li> <li>The log lists additional detail for the Changed Certificate alarm.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                       | Changed Certificate Alarm log |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| XPKT log (new)        | XPKT340                       | Feature A00007120 (UA-IP, PT-AAL2) introduces this log for reporting a variety of Gateway, Gateway Controller, and PKTMA resource problems, including failed anchor attempts.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b> | <b>Log/Fault Name</b>                                          | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IWBM logs (new)       | IWBM502<br>IWBM503<br>IWBM504<br>IWBM505                       | Feature A00007121 (PT-IP, UA-IP) introduces the following logs: <ul style="list-style-type: none"> <li>IWBM502 indicates that a BSY command is being requested for a set of IW SPM bridge terminals.</li> <li>IWBM503 indicates that an RTS command is being requested for a set of IW SPM bridge terminals.</li> <li>IWBM504 indicates that an OFFL command is being requested for a set of IW SPM bridge terminals.</li> <li>IWBM505 indicates that a FRLS command is being requested for a set of IW SPM bridge terminals.</li> </ul>                                                                                                                                                                                                                                                               |
| SIPC logs (new)       | SIPC310 Raise and Clear                                        | Feature A00007270 (PT-IP, PT-AAL2) introduces the following logs: <ul style="list-style-type: none"> <li>SIPC310 (Raise) is associated with the generation of the Major alarm due to reaching a predefined threshold in call processing capacity.</li> <li>SIPC310 (Clear) is generated when SIP Gateway Application is no longer in Overload.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SPC Logs (new)        | SPCP501<br>SPCP502<br>SPCP601<br>SPCP602<br>SPCP603<br>SPCP604 | Feature A00007393 (CHS) introduces the following logs: <ul style="list-style-type: none"> <li>SPCP501 is generated when the SPC starts up or when the Topology Manager starts up.</li> <li>SPCP502 is generated when the SPC or Topology Manager shuts down</li> <li>SPCP601 is generated when a Flow Status Audit is completed.</li> <li>SPCP602 is generated when a CAC request from the Application Server is denied.</li> <li>SPCP603 is generated when spc callp or the topology manager accepts a topology change.</li> <li>SPCP604 is generated when callP detects that the Ingress Id of the Network Segment sent in a GateSet message from the GWC is not present in the SPC database. This is an indication that there could be a topology mismatch between the SPC and GWC/SESM.</li> </ul> |

**Summary of new or changed Logs/Faults for SN08**

| Log/Fault Type    | Log/Fault Name                                                                                                                                                                                                                                                                        | New/Modified/Deleted, ACTID and Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPC alarms (new)  | Application Server Signaling Communication Failure<br><br>No Database Connection<br><br>Reservation Request Mass Failure<br><br>Endpoint Number Exceeds Endpoint Block Size<br><br>Endpoint Number Exceeds Endpoint Block Warning Size<br><br>Topology Manager No Database Connection | Feature A00007393 (CHS) introduces the following alarms: <ul style="list-style-type: none"> <li>• Application Server Signaling Communication Failure (Major) is generated for an Application Server Signaling interface communication failure.</li> <li>• No Database Connection (Critical) is generated if SPC cannot establish a connection with the database during Policy Controller process initialization.</li> <li>• Reservation Request Mass Failure (Minor) is generated when the Application server request failure ratio exceeds the predefined threshold value.</li> <li>• Endpoint Number Exceeds Endpoint Block Size (Critical) is generated when SPC Endpoint Number Exceeds Endpoint Block Size.</li> <li>• Endpoint Number Exceeds Endpoint Block Warning Size (Major) is generated when SPC Endpoint Number Exceeds Endpoint Block Warning Size.</li> <li>• Topology Manager No Database Connection (Critical) is generated if SPC cannot establish a connection with the database during Topology Manager process initialization or if the application fails to access the DB.</li> </ul> |
| CAP log (Changed) | CAP101                                                                                                                                                                                                                                                                                | Feature A00007417 (DMS) changes the CMICOVLD field to IOOVRD to indicate both the CMIC and Ethernet link overloading condition.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Summary of new or changed Logs/Faults for SN08**

| Log/Fault Type              | Log/Fault Name                                                                      | New/Modified/Deleted, ACTID and Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
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| SAM21 alarms (New)          | UnderlyingResourceUnavailable (2)<br><br>BootServerUnavailable<br><br>NFSMountsDown | Feature A00007424 (PT-IP, UA-IP, IAC, IAW, PT-AAL2) introduces the following alarms: <ul style="list-style-type: none"> <li>UnderlyingResourceUnavailable is a minor alarm when it indicates that an application card is locked and is not available.</li> <li>UnderlyingResourceUnavailable is a major alarm when it indicates that an application card is being autorecovered.</li> <li>BootServerUnavailable indicates that the boot server cannot be reached. Severity may vary.</li> <li>NFSMountsDown is raised for any mounts that remain down after the check and attempt to re-mount.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| RTP Media Portal logs (New) | RTP101<br><br>RTP102<br><br>RTP103<br><br>RTP104<br><br>RTP105                      | Document NN10383-900 explains the following logs in detail: <ul style="list-style-type: none"> <li>RTP101 (Critical) from alarm "Blade Out of Service." Occurs when Managed IP or MCP Service network difficulties (communication problems) are encountered when attempting to communicate with the Media Blade specified by BladeName.</li> <li>RTP102 (Critical/Major) from alarm "RTP Media Portal Out of Service." Occurs when timer activated event checks availability of Media Blades that are currently configured or when a OutOfServiceAlarm is raised.</li> <li>RTP103 (Critical) from alarm "Best Blade Selection." Occurs during session setup when the host attempts to determine which media blade should handle the session.</li> <li>RTP104 (Critical/Major/Minor) from alarm "Port Usage." Occurs when timer activated event checks to see what percentage of the configured Managed IP Network ports are in use.</li> <li>RTP105 (Major) from alarm "Host Interface Failure." Occurs when a timer activated event checks the status of host network interfaces.</li> </ul> |



**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>  | <b>Log/Fault Name</b>              | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| IAA logs (new)         | IAA314                             | Feature A00007465 (IAC, DMS) introduces the following logs: <ul style="list-style-type: none"> <li>• IAA314 is generated whenever an IAA module fails to initialize. The reason text field may contain one of 7 possible strings.</li> <li>• IAA342 is generated whenever an IAA module cannot communicate with other IAA modules, i.e., EMDA.</li> <li>• IAA343 is generated when a PCEM processing error occurs. The reason text field may contain one of 6 possible strings.</li> <li>• IAA344 is generated when an IAA module cannot create an audit entry.</li> <li>• IAA345 is generated when an IAA module detects a configuration problem. The reason text field may contain one of 2 possible strings.</li> <li>• IAA346 is generated when an IAA cannot communicate to the downstream RKS pair or DF. The reason text field may contain one of 4 possible strings.</li> <li>• IAA347 is generated when an IAA module detects a problem when trying to manage its filesystem storage.</li> <li>• IAA641 is generated when an IAA module goes into service.</li> <li>• IAA646 is generated when communications between the IAA and the downstream RKS pair or DF has been restored.</li> <li>• IAA701 is generated when the data being process by the IAA is corrupted.</li> </ul> |
|                        | IAA342                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA343                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA344                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA345                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA346                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA347                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA641                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA646                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                        | IAA701                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| SDM security log (new) | Authentication succeeded or failed | Feature A00007489 (DMS, PT-AAL2) introduces the SN08 Authentication and Authorization Security Syslog, generated when a security event occurs on a SDM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>          | <b>Log/Fault Name</b>                | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|--------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDM file integrity audit (new) | N/A                                  | Feature A00007491 (DMS, PT-AAL2) monitors the files on the SDM and records file change events to log files. File change events will be logged to one of two log files, auditlog, and securitylog. File changes resulting from regular configuration changes will be recorded in the auditlog file. File changes which are abnormal will be recorded in the securitylog file.                                                                                                                                                                                                                            |
| USNBD logs (new)               | UNB300<br>UNB302<br>UNB304<br>UNB305 | Feature A00007548 (IAC) introduces the following logs. Access to UNB logs is only provided to PCES users through LOGUTIL's OPENSECRET command. <ul style="list-style-type: none"> <li>• UNBD300 reports problems with USNBD shared resources used by PCES.</li> <li>• UNB302 reports problems with USNBD processes used by PCES.</li> <li>• UNB304 reports success and failure of surveillance activation and deactivation, and problems with surveillance activation.</li> <li>• UNB305 reports problems that affect PCES administration data and reports all user creations and deletions.</li> </ul> |
| SDM patch check alarm (new)    | N/A                                  | Feature A00007602 (DMS, PT-AAL2) introduces a new minor alarm generated under the "sdmmtc sys" level, raised upon a patch signature check failure.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| SDM security logs (new)        | SDM337<br>SDM637                     | Feature A00007602 (DMS, PT-AAL2) introduces security logs generated to report patch signature check failures and manual alarm clearing. <ul style="list-style-type: none"> <li>• SDM337 indicates that the patch failed signature checking.</li> <li>• SDM637 indicates that patch check status is cleared by the user.</li> </ul>                                                                                                                                                                                                                                                                      |

**Summary of new or changed Logs/Faults for SN08**

| Log/Fault Type                   | Log/Fault Name                                                                                   | New/Modified/Deleted, ACTID and Solution                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDM logs (changed)               | SDM314<br>SDM330<br>SDM334<br>SDM335<br>SDM336<br>SDM614<br>SDM633<br>SDM634<br>SDM635<br>SDM636 | Per CRs Q00990600 and Q01019345, these logs are modified for Event Type and Event Label clean up, and a format change of the DS512 link enumeration within the log where applicable.                                                                                                                                                                                                                                                                                                                      |
| CBM upgrade log (new)            | N/A                                                                                              | Feature A00007635 (PT-IP, DMS, PT-AAL2) introduces a CBM upgrade log that is generated for any CBM upgrade failure.                                                                                                                                                                                                                                                                                                                                                                                       |
| QCA logs format (changed)        | N/A                                                                                              | <p>Feature A89007819 (PT-IP, IAW,IAC) modifies the format of the QCA logs as follows:</p> <ul style="list-style-type: none"> <li>Description and the Messages of QCA Logs are now separated and an example log for each report number is provided</li> <li>A note added specifying logs that are Raised/Cleared as alarms.</li> <li>Separate table with report number and example log message given for better readability.</li> </ul> <p>Appendix A of this feature contains a list of the QCA logs.</p> |
| <b>Product = CS 2000 Compact</b> |                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| CCA logs (new)                   | CCA685<br><br>CCA686                                                                             | <p>Feature A00008431 (PT-IP, UA-IP, IAC, IAW, CHS, PT-AAL2) introduces these logs:</p> <ul style="list-style-type: none"> <li>CCA685 is an INFO log which indicates that the CCA disabled OSPF in the local ERS8600.</li> <li>CCA686 is an INFO log which indicates that the CCA enabled OSPF in the local ERS8600.</li> </ul>                                                                                                                                                                            |
| CCA logs (changed)               | CCA331<br><br>CCA336<br><br>CCA631<br><br>CCA635<br><br>CCA636                                   | Feature A00008431 (PT-IP, UA-IP, IAC, IAW, CHS, PT-AAL2) modifies these logs with an enhanced <i>Description</i> when in Geographic Survivability mode, giving details of the connection states being monitored. The description format is the same for each of these logs, although the fields differ depending on the condition being logged. When not in Geographic Survivability mode, the logs appear as documented previously.                                                                      |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>          | <b>Log/Fault Name</b>                                                                                                                | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCA CON alarms (changed)       | LnkCon<br>MatCon<br>NetCon                                                                                                           | Feature A00008431 (PT-IP, UA-IP, IAC, IAW, CHS, PT-AAL2) modifies these three alarms. They describe the connectivity map for the monitored connections. In Geographic Survivability mode, the description is extended to show the enhanced connection monitoring. The description fields are identical to the corresponding CCA logs.                                                                                                                                                                                                                                                                                         |
| <b>Product = CS 2000 - GWC</b> |                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| GWC security logs (new)        | (See next column)                                                                                                                    | Feature A00007101 (PT-IP, UA-IP, IAW, CHS, PT-AAL2) creates the following new security logs: <ul style="list-style-type: none"> <li>telnet connection from remote host</li> <li>serial connection</li> <li>login attempted</li> <li>login result</li> <li>authentication server unreachable</li> <li>logout (by request, force out, or idle timeout)</li> <li>local account login</li> <li>local password change/reset</li> <li>GWC restart</li> <li>GWC reload</li> </ul>                                                                                                                                                    |
| GWC alarms (new)               | External Host Interface Signal Loss<br><br>External Host Interface Configuration Error<br><br>External Host Interface Protocol Error | Feature A00007113 (PT-IP, PT-AAL2) creates the following alarms to report communication path lost problems: <ul style="list-style-type: none"> <li>External Host Interface Signal Loss, based on the number of gateways that are out of service as compared to the number of gateways provisioned checked on a 5 minute polling period.</li> <li>External Host Interface Configuration Error, based on a 5 minute polling period.</li> <li>External Host Interface Protocol Error, based on the number of USP connections that are not active but do have heartbeat messages checked on a 5 minute polling period.</li> </ul> |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>                     | <b>Log/Fault Name</b>                                                        | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Media Proxy alarm (new)                   | Media Proxy Communications Failure                                           | <p>Feature A00007327 (CHS) introduces this alarm based on the number of media proxies that are out of service as compared to the number of media proxies provisioned checked on a 5-minute polling period. Media proxies are considered out of service when they fail to respond to messages sent from the GWC, and returned to service when the regular RSIP message is received by the GWC. The severity varies as follows:</p> <ul style="list-style-type: none"> <li>• Critical - Over 50% of media proxies disabled.</li> <li>• Major - Over 20% of media proxies disabled.</li> <li>• Minor - Any media proxies disabled.</li> </ul> |
| <b>Product = CS 2000 Management Tools</b> |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| CMT log (new)                             | CMT303                                                                       | Feature A00007102 (PT-IP, UA-IP, IAW, IAC, CHS, PT-AAL2) introduces a Critical automatically generated log upon the raising/clearing of a CMT alarm.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| CMT log (new)                             | CMT600                                                                       | Per CR Q00712240, CMT600 is created when an RMGC overflow condition is detected. This log is propagated to the IEMS under the "other" category.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| CMT alarm (new)                           | No Available Call Server IP                                                  | Feature A00007102 (PT-IP, UA-IP, IAW, IAC, CHS, PT-AAL2) introduces this Critical alarm, raised if the SESM cannot get any available C-Side IP address from the Core.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| QCA logs (new and changed)                | QCA300 (chg)<br>QCA315 (chg)<br>QCA305 (chg)<br>QCA399 (new)<br>QCA203 (new) | <p>Feature A00008338 (IAC) consolidates logs and alarms for the QoS Collector Application:</p> <ul style="list-style-type: none"> <li>• QCA300 priority is changed to None.</li> <li>• QCA315 priority is changed to None, and any of several new reasons may show up.</li> <li>• QCA305 priority is changed to None. Reason for generation is changed to when the connection to client is closed.</li> <li>• QCA399 is the clear log for QCA301 or QCA310.</li> <li>• QCA203 indicates that the QCA cannot be stopped.</li> </ul>                                                                                                         |
| <b>Product = CS 2000 TOPS</b>             |                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| TEOL log (changed)                        | TEOL100                                                                      | Feature A00007271 (UA-IP) modifies this log to add OSSAIN MIS to the list of values.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>         | <b>Log/Fault Name</b>       | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOPS log (new)                | TOPS615                     | Feature A00007713 (PT-IP, DMS) creates this INFO log to indicate the operator teams and the number of positions in each team with auto-compression turned on.                                                                                                                                                                                                                                                                                                                                                            |
| <b>Product = CICM</b>         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| CICM logs (new)               |                             | Feature A00003953 (CHS) creates the following INFO logs for normal start-up events: <ul style="list-style-type: none"> <li>• Component initializes on master.</li> <li>• Component initializes on slave.</li> <li>• Slave component requests a bulk sync.</li> <li>• Bulk sync of data completes; ready for SWACT.</li> </ul>                                                                                                                                                                                            |
| CICM logs (new)               |                             | Feature A00003953 (CHS) creates the following INFO logs as components perform operator-initiated switch of activity: <ul style="list-style-type: none"> <li>• Component on master receives notification to SWACT.</li> <li>• Component on slave receives request from its counterpart to assume the role of the master.</li> <li>• Component on slave completes transition to active.</li> <li>• Component on master receives acknowledgment from mate that it is now active; completes transition to active.</li> </ul> |
| <b>Product = IEMS</b>         |                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| IEMS northbound SCC2 log feed | All Logs in the SCC2 stream | CR Q01091683 in SN09 has changed the IEMS SCC2 northbound log stream to the OSS. This change affects only the Start of Log delimiter. Previously, the Start of Log delimiter was just a carriage return (0D in hexadecimal). With this CR implementation, the Start of Log string has been changed to be a line feed followed by a carriage return. (0A0D in hexadecimal). This change has been patched back to SN08 via CR Q01091683-01 and to SN07 as well via CR Q01091683-02.                                        |
| IEMS supported logs           |                             | Feature A00007302 (PT-IP, PT-AAL2) lists IEMS-supported logs in its Appendix A.                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>             | <b>Log/Fault Name</b>      | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CEM SAF logs                      | TMN 300-399<br>TMN 600-699 | Feature A00007304 (UA-IP, PT-AAL2) describes the logs generated by the Core Element Manager (CEM) Store and Forward (SAF) framework. Trouble logs are in the range TMN 300-399, and Info logs are in the range TMN 600-699. Examples: <ul style="list-style-type: none"> <li>• TMN301: Application error</li> <li>• TMN302: System error</li> <li>• TMN303: Communication error</li> <li>• TMN309: Data Server error</li> <li>• TMN311: Fatal error</li> <li>• TMN600: Information only</li> <li>• TMN601: File IO info</li> <li>• TMN604: Application status</li> <li>• TMN630: DataServer OK</li> </ul> |
| Data Server process logs          |                            | Feature A00007304 (UA-IP, PT-AAL2) lists 12 Data Server process logs which can be seen in the /var/adm/custlog file on the SDM/CBM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| NLClient and NLServer logs        |                            | Feature A00007304 (UA-IP, PT-AAL2) lists 42 logs generated by the NLServer and nlSafServer which can be seen in the /var/adm/custlog file on the SDM/CBM.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| logNormalizer and logNormSAF logs |                            | Feature A00007304 (UA-IP, PT-AAL2) lists 22 logs generated by these two processes. Messages can be seen in the /opt/nortel/logs/coreEMS/custlog file on the CEM server.                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| PP8600 logs (new)                 |                            | Feature A00007343 (UA-IP, PT-AAL2) implements extended fault mapping for PP8600 logs in IEMS. The log format changes for all PP8600 originated logs to mirror the behavior of the MDM-SDM system. This feature includes a list of supported logs.                                                                                                                                                                                                                                                                                                                                                         |
| IEMS Security logs (changed)      |                            | Feature A00007388 (UA-IP) enables the generation of a security log in these instances: <ul style="list-style-type: none"> <li>• Any unauthorized configuration access attempts of measurement collection jobs.</li> <li>• Any unauthorized configuration access attempts of measurement transfer jobs.</li> <li>• Any unauthorized configuration access attempts of measurement report jobs.</li> </ul>                                                                                                                                                                                                   |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>    | <b>Log/Fault Name</b>         | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|--------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMSS logs (new)          | EMSS313<br>EMSS314<br>EMSS315 | Feature A00007717 (PT-IP, PT-AAL2) introduces the following new logs: <ul style="list-style-type: none"><li>• EMSS313 is an INFO log produced when ever the radius server health monitor detects the radius process is not functional.</li><li>• EMSS314 is an INFO log produced when ever the identity server health monitor detects the identity server process is not functional.</li><li>• EMSS315 is an INFO log produced when ever the PAM login servlet health monitor detects the PAM login servlet is not functional.</li></ul> |
| IEMS Security logs (new) | IEMSSclass_security.ver01     | Feature A00007786 (UA-IP) introduces the following security logs: <ul style="list-style-type: none"><li>• generated when a tuple is added for the IP address in the security server.</li><li>• generated when the RADIUS secret is updated for the IP address in the security server.</li><li>• generated when a delete operation occurs for the IP address in the security server.</li></ul>                                                                                                                                            |



**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>                    | <b>Log/Fault Name</b>                                     | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CEM logs and processes on IEMS (changed) | CSEM300<br><br>Northbound feeds<br><br>addrep/delrep logs | <p>Feature A00008907 (UA-IP) modifies CEM Logs and processes on IEMS as follows:</p> <ul style="list-style-type: none"> <li>The log in the IEMS GUI will be altered to CSEM 300 or CSEM600.</li> <li>The northbound feeds from IEMS will have these new fields placed in them: <ul style="list-style-type: none"> <li>populate the logkey field with logname/number.</li> <li>populate the logname field with "CSEM".</li> <li>populate the lognumber field with "300" for alarm sets and clears and "600" for info logs or unmapped logs.</li> <li>populate the eventtype field with "TBL" on raise and "INFO" on clear and "INFO" for unmapped logs.</li> <li>populate the specificproblem field with the probable cause.</li> <li>populate the "bodytext" field with specified fields</li> </ul> </li> <li>The user can addrep/delrep logs that the CEM will receive from the CORE.</li> </ul> |
| <b>Product = MG 9000</b>                 |                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| MG9K security alarms (new)               | (see description)                                         | <p>Feature A00005561 (UA-IP) introduces the following Security Alarms at the EM and the LCI:</p> <ul style="list-style-type: none"> <li>Non-responsive RADIUS Server</li> <li>Expired Links to Security Peers</li> <li>Replayed Packet threshold</li> <li>Packet Discard threshold</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| MG9K security events logs (new)          | (see description)                                         | <p>Feature A00005561 (UA-IP) introduces the following Security events logs at the EM:</p> <ul style="list-style-type: none"> <li>IKE negotiation errors</li> <li>IP packet authentication failures</li> <li>Packet discard</li> <li>Replayed packets</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| IPSec Syslog messages (new)              |                                                           | <p>Feature A00005561 (UA-IP) documents the wide variety of IKE failure messages generated to syslog.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b> | <b>Log/Fault Name</b> | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MG9K alarms (new)     | (see description)     | <p>Feature A00005646 (UA-IP) introduces the following alarms:</p> <ul style="list-style-type: none"> <li>• Unable to communicate with RADIUS Server</li> <li>• Secure link Down with GWC</li> <li>• Packet Discard (depends on the threshold set)</li> <li>• Overload Controls--these alarms will now also apply to the ABI &amp; ITP Card as well as the DCC Card.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| MG9K logs (new)       | (see description)     | <p>Feature A00005646 (UA-IP) introduces the following logs as thresholds. When the threshold is crossed, an alarm will be generated.</p> <ul style="list-style-type: none"> <li>• Logging Event <ul style="list-style-type: none"> <li>— Sequence_Number_Overflow</li> <li>— Life_Time_Expired, Type = Soft/Hard</li> </ul> </li> <li>• Security Policy Database <ul style="list-style-type: none"> <li>— SAD_Discard_Policy:- Direction (in/outbound)</li> <li>— SAD_Lookup_Fail, info needed:- Direction (in/out bound):- Sub-info field invalid SPI, Replayed packet</li> </ul> </li> <li>• IKE <ul style="list-style-type: none"> <li>— IKE_Main_Mode-Failed, Mismatched PSK</li> <li>— IKE_Quick_Mode-Failed, Proposal mismatch, NULL ESP &amp; authentication = null, en/decryption failures</li> <li>— IKE_Packet Discarded, decryption errors, Auth errors</li> </ul> </li> <li>• IPsec Security Association <ul style="list-style-type: none"> <li>— SA_Decryption_Error</li> <li>— SA_Authentication_Error</li> </ul> </li> </ul> |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b> | <b>Log/Fault Name</b>                                                                                                                                                                   | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DACV alarms (new)     | DACV at Rail<br><br>DACV Out of Range                                                                                                                                                   | <p>Feature A00006906 (UA-IP) introduces the following alarms.</p> <ul style="list-style-type: none"> <li>DACV at Rail is a Major alarm to indicate the ITP clock circuitry has attempted to acquire sync and has traversed the frequency range to the extreme end of its capture range. It typically indicates that the incoming clock reference is not synchronized to a good reference and is out of the MG9K's acceptable frequency range.</li> <li>DACV Out of Range is a Major alarm to indicate that the ITP 's DACV clock circuitry is in an invalid condition and the values are out of range.</li> </ul>                                                                                                                                                                                                                                             |
| GIGE alarms           | New<br>301 LOS<br>302 RFI<br>304 TEM<br>305 POW<br>306 RxSD<br>307 RxEED<br>308 TBC<br>309 LINT<br>310 OPT<br>311 OPR<br>312 GARP<br>313 LKINT<br>314<br>AUTONEG<br>315 NON<br>PREFLINK | <p>Feature A00007000 (UA-IP) adds new GIGE alarms.</p> <ul style="list-style-type: none"> <li>301 LOS, Loss of Signal, Critical</li> <li>302 RFI, Remote Failure Indication, Critical</li> <li>304 TEM, Temperature Threshold Exceeded, Critical</li> <li>305 POW, Low power indicated, Critical</li> <li>306 RxSD, Receive Signal Degraded, Critical</li> <li>307 RxEED, Receive Excessive Error Ratio, Critical</li> <li>308 TBC, Transmit Bias Current, Critical</li> <li>309 LINT, Link Initialization, Critical</li> <li>310 OPT, Transmit Optical Power, Critical</li> <li>311 OPR, Receive Optical Power, Critical</li> <li>312 GARP, GARP Failure, Critical</li> <li>313 LKINT, Link Integrity Failure, Critical</li> <li>314 AUTONEG, Auto Negotiation Failure, Critical</li> <li>315 NONPREFLINK, Non-preferred Link is active, Critical</li> </ul> |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b> | <b>Log/Fault Name</b> | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                         |
|-----------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| GIGE Logs (new)       | GIGE301               | Feature A00007000 (UA-IP) adds new logs related to GIGE alarms.                                                                         |
|                       | GIGE302               | <ul style="list-style-type: none"> <li>GIGE301 indicates a Communications Subsystem Failure, loss of signal.</li> </ul>                 |
|                       | GIGE303               | <ul style="list-style-type: none"> <li>GIGE302 indicates a Communications Subsystem Failure, remote failure.</li> </ul>                 |
|                       | GIGE304               | <ul style="list-style-type: none"> <li>GIGE303 indicates a Communications Subsystem Failure, transmit failure.</li> </ul>               |
|                       | GIGE306               | <ul style="list-style-type: none"> <li>GIGE304 indicates a Communications Subsystem Failure, temperature threshold exceeded.</li> </ul> |
|                       | GIGE307               | <ul style="list-style-type: none"> <li>GIGE306 indicates a Communications Subsystem Failure, low power indicated.</li> </ul>            |
|                       | GIGE308               | <ul style="list-style-type: none"> <li>GIGE307 indicates a Communications Subsystem Failure, transmit excessive error ratio.</li> </ul> |
|                       | GIGE309               | <ul style="list-style-type: none"> <li>GIGE308 indicates a Communications Subsystem Failure, transmit bias current.</li> </ul>          |
|                       | GIGE310               | <ul style="list-style-type: none"> <li>GIGE309 indicates a Communications Subsystem Failure, link initialization.</li> </ul>            |
|                       | GIGE311               | <ul style="list-style-type: none"> <li>GIGE310 indicates a Communications Subsystem Failure, transmit optical power.</li> </ul>         |
|                       | GIGE312               | <ul style="list-style-type: none"> <li>GIGE311 indicates a Communications Subsystem Failure, receive optical power.</li> </ul>          |
|                       | GIGE313               | <ul style="list-style-type: none"> <li>GIGE312 indicates a Communications Subsystem Failure, GARP failure.</li> </ul>                   |
|                       | GIGE314               | <ul style="list-style-type: none"> <li>GIGE313 indicates a Communications Subsystem Failure, link integrity failure.</li> </ul>         |
|                       | GIGE315               | <ul style="list-style-type: none"> <li>GIGE314 indicates a Communications Subsystem Failure, autonegotiation failure.</li> </ul>        |
|                       | GIGE315               | <ul style="list-style-type: none"> <li>GIGE315 indicates a Communications Subsystem Failure, non-preferred link is active.</li> </ul>   |
| MGEM log (new)        | MGEM714               | Feature A00007140 (UA-IP, PT-AAL2) introduces this log which is raised each time the MG9K Upgrade Tool is executed.                     |

**Summary of new or changed Logs/Faults for SN08**

| <b>Log/Fault Type</b>                                   | <b>Log/Fault Name</b>            | <b>New/Modified/Deleted, ACTID and Solution</b>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OMC log (new)                                           | OMC300                           | Feature A00007213 (UA-IP) introduces the following log:<br><br>OMC300 indicates that the OM Collector failed to collect OM files from the MG9K during a particular collection interval.<br><br>OMC300 also indicates that the OM Collector is able to restart collecting OM files from the MG9K.                                                                                                                                                                                            |
| OMC logs (deleted)                                      | OMC700, OMC701                   | Feature A00007213 (UA-IP) deletes these logs in SN08.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| ESA304 (nnEsaCoiFault)<br><br>ESA312 (ESA Provis Fault) |                                  | Feature A00007415 (UA-IP) introduces the following logs:<br><br><ul style="list-style-type: none"> <li>• ESA304 (Major) is generated by the EM in response to a trap from the MG9000 (nnEsaColFault). The MG9000 sends this trap when it detects communication problems to other nodes in the same community of interest.</li> <li>• ESA312 (Major) is generated by the EM when a failure occurs while trying to provision internodal community of interest data for a given NE.</li> </ul> |
| NE logs (changed)                                       | NE501<br>NE601<br>NE602<br>NE608 | Per CR 1040410, these logs have been modified to add the Card load name and serial number of the affected card to the log content.                                                                                                                                                                                                                                                                                                                                                          |
| SNMP logs (changed)                                     | SNMP300<br>SNMP600               | Per CR 1010546, log SNMP300 is changed to SNMP600. SNMP300 no longer exists.                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Product = Network Patch Manager (NPM)</b>            |                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         | (see description)                | Feature A00006901 (PT-IP, UA-IP, IAC, PT-AAL2) introduces the following 3 alarms:<br><br><ul style="list-style-type: none"> <li>• REL_GEN_NOT_APP, a Major alarm raised when a released patch has not been applied. Relates to log NPM360.</li> <li>• PFRSGETPATCH, a Major alarm raised when the PFRS GENREPORT task has failed. Relates to log NPM360.</li> <li>• PFRSGENREPORT, a Major alarm raised when the PFRS GETPATCH task has failed. Relates to log NPM360.</li> </ul>           |

### Data Schema/MIBs changes overview

The following Data Schema tables or MIBs are new or changed for SN08. More complete descriptions will appear in the Feature Deltas section of this document.

#### Summary of new/changed Data Schema/MIBs information for SN08

| Table or MIB name                 | New or changed | Description                                                                                                                                                                                                                                                                                                                                                |
|-----------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = Call Server 2000</b> |                |                                                                                                                                                                                                                                                                                                                                                            |
| IBNFEAT                           | Changed        | Feature A59039138 (IAC) adds the new announcement field MWT_ANNOUNCEMENT to the MWT feature in table IBNFEAT.                                                                                                                                                                                                                                              |
| RECEIVER                          | Changed        | Feature A00005932 (DMS) modifies table RECEIVER to use the DTMF digit receiver in DISA calls.                                                                                                                                                                                                                                                              |
| NT POLL                           | New            | Feature A00006226 (DMS) creates new table NT POLL which contains a visual representation of the poll steps to be done during the next polling, as well as the ability to modify, add, or delete poll steps at the user's discretion via Table Control.                                                                                                     |
| IBNLINES                          | Changed        | Feature A00006731(DMS) modifies IBNLINES by adding line option EOF to the OPTLIST subfield under field RESULT.                                                                                                                                                                                                                                             |
| LGRPINV                           | Changed        | Feature A00007071 (IAW) modifies LGRPINV by adding a new value of "LL_3rdparty" to field GRPTYPE and adding new optional field GTWYKEY to field LGRPOPTS (visible, not provisionable).                                                                                                                                                                     |
| SERVSINV                          | Changed        | Feature A00007120 (PT-IP, PT-AAL2) modifies SERVSINV by adding new entry PKTMA_MAX_CALLS with subfield PKTMA_MAX_CALLS under the OPTIONS field.                                                                                                                                                                                                            |
| ACDMISPL                          | Changed        | Feature A00007250 (DMS) modifies ACDMISPL to define the relationship between the ACDMIS pool and the transport type, X.25 or TCP/IP by adding new field LINKSEL. This field will serve a dual purpose of defining which remote IP addresses are allowed access to the DMS-100/CS2K as well as defining the relationship between the pool and session link. |

**Summary of new/changed Data Schema/MIBs information for SN08**

| Table or MIB name              | New or changed | Description                                                                                                                                                                                                                                                                                                                   |
|--------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOGTHROT                       | New            | Feature A00007277 (DMS) creates table LOGTHROT to implement LOGs throttling functionality for XA-Core, thus allowing the customer to specify on Time Units and Thresholds per Report Name. Only core logs can be throttled.                                                                                                   |
| ISERVOPT                       | Changed        | Feature A00007383 (DMS) modifies ISERVOPT as follows: <ul style="list-style-type: none"> <li>• Entry DNH_OPTS is added to field SOPTSKEY</li> <li>• Entry DNH_OPTS is added to field SOPTSVAR/OPTION</li> <li>• New subfields PILOT_CHARGE and PILOT_DISPLAY are added to entry DNH_OPTS in field SOPTSVAR/OPTION.</li> </ul> |
| SDMBILL                        | Changed        | Feature A00007464 (IAC, DMS) modifies this table to include additional field EXPEDITE to provide delivery of PacketCable Event Messages (billing data) to CBM.                                                                                                                                                                |
| AMAOPTS                        | Changed        | Feature A00007752 (DMS) modifies this table by adding option CORRID to capture the Universal Billing Correlation ID for BC AMA format.                                                                                                                                                                                        |
| CDRTMPLT                       | Changed        | Feature A00007752 (DMS) modifies this table by adding parameter CORRID to the list of parameters which can be datafilled in table CDRTMPLT, thus allowing the capture and recording of the Universal Billing Correlation ID for CDR.                                                                                          |
| KSETINV                        | Changed        | Feature A00007790 (PT-IP, DMS) modifies this table to increase the maximum table size from 31,743 to 150,000.                                                                                                                                                                                                                 |
| NSCPMAP                        | New            | Feature A00007934 (DMS, PT-AAL2) introduces table NSCPMAP to provide a mapping from the originator's STDPRT name to a new STDPRT name for use by the E800 Response translation.                                                                                                                                               |
| NSCDEFS                        | Changed        | Feature A00007934 (DMS, PT-AAL2) modifies table NSCDEFS to add new option PRETRANMAP as a provisioning trigger for activating a lookup in new table NSCPMAP. It also provides equivalent functionality to the existing NSCDEF's option PRETRAN.                                                                               |
| <b>Product = CS 2000 - GWC</b> |                |                                                                                                                                                                                                                                                                                                                               |

**Summary of new/changed Data Schema/MIBs information for SN08**

| Table or MIB name                                                     | New or changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INVENTORY.ROLES<br><br>INVENTORY.ELEMENTTYPE<br><br>INVENTORY.ELEMENT | Changed        | <p>Feature A00007102 (PT-IP, UA-IP, IAW, IAC, CHS, PT-AAL2) modifies the following MIBs:</p> <ul style="list-style-type: none"> <li>INVENTORY.ROLES--In order to support new element "C-Side IP address" storage in the Inventory database, a new role is added into this table.</li> <li>INVENTORY.ELEMENTTYPE--In order to support new element "C-Side IP address" storage in the Inventory database, a new type is added into this table.</li> <li>INVENTORY.ELEMENT--This table will be used to store the new element "C-Side IP address" retrieved from the Core. Up to two CSIPs will be stored in this table, the element name should be "CSIP-0" and "CSIP-1".</li> </ul> |
| <b>Product = CS 2000 Management Tools</b>                             |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| pfrsScheduler                                                         | Changed        | Feature A00006570 (UA-IP, PT-AAL2) modifies this MIB to remove field CLLI from this table. NPM transfers to use CM CLLI in /etc/profile.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NENDPT                                                                | New            | Feature A00006635 (IAC) creates new table NENDPT to map the gateway/endpoint with LEN in CM, which can be used to create the event messaging records that are sent to north bound OSS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Product = CS 2000 TOPS</b>                                         |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| (See description column)                                              | Deleted        | Feature A00007271 (PT-IP) verifies that tables ARUIBMRT, DUAQOPT, DQMODEM, and HOBICDEV were deleted in SN08, and that tables OPRDAT and SAQSIZE were deleted in SN08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |



**Summary of new/changed Data Schema/MIBs information for SN08**

| Table or MIB name                                       | New or changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OCGRP<br>TOPSPOS<br>OCHOSTQ<br>TQMSFCQA                 | Changed        | <p>Feature A00007271 (PT-IP) modifies these tables as follows:</p> <ul style="list-style-type: none"> <li>OCGRP--All tuples with a DLSEL (within the DLOVRLAY field) of LAPD will be removed as of SN08.</li> <li>TOPSPOS--All tuples with a DATATYPE (within the DATAPATH field) of TMS will be removed as of SN08.</li> <li>OCHOSTQ--all tuples which have a REROUTESEL of Y will have VLTHROTL removed from their REASONS set (if it is present) as of SN08.</li> <li>TQMSFCQA--All tuples with an ASSTTYPE (within the ASSTAREA field) of SA cannot be added as of SN08.</li> </ul> |
| <b>Product = Integrated EMS</b>                         |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| PLATFORMUS<br>ERDETAILS<br><br>PLATFORMGR<br>OUPDETAILS | Changed        | <p>Feature A00006756 (UA-IP) creates these two tables. They contain all the information of <i>/etc/passwd</i>, <i>/etc/shadow</i>, <i>/etc/group</i> files.</p>                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Product = MG 9000</b>                                |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| NORTEL-UEM<br>G-PERFMON-MIB                             | Changed        | <p>Feature A00005646 (UA-IP) modifies this MIB so the simple names of the items for Thresholds and Overload no longer reference the DCC.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ifEntry table                                           | Changed        | <p>Feature A00007074 (UA-IP) modifies this MIB to allow for GigE specific values.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Summary of new/changed Data Schema/MIBs information for SN08**

| Table or MIB name        | New or changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (see Description column) | New            | <p>Feature A00007074 (UA-IP) creates the following MIBs:</p> <ul style="list-style-type: none"> <li>• ifMauEntry, descriptive and status information about MAU(s) attached to an interface.</li> <li>• ifJackEntry, information about the external jacks attached to MAUs attached to an interface.</li> <li>• ifMauAutoNegEntry, configuration and status objects for the auto-negotiation function of MAUs attached to interfaces.</li> <li>• dot3Stats, configuration and status objects for the Dot3 stats function of each interface.</li> <li>• dot3HCStatsEntry, configuration and status objects for the Dot3 stats function of each interface.</li> <li>• dot3PauseEntry, configuration and status objects for the Dot3 pause function of each interface.</li> <li>• EtherStatsEnty, configuration and status objects for the ethernet statistics function of each interface.</li> <li>• MediaIndependentEntry, configuration and status objects for the Media Independent statistics function of each interface.</li> <li>• EtherStatsHighCapacityEntry, configuration and status objects for the Ethernet high capacity statistics function of each interface.</li> <li>• EtherHistoryEntry, configuration and status objects for the Ethernet historical statistics function of each interface.</li> <li>• EtherHistoryHighCapacityEntry, configuration and status objects for the Ethernet High Capacity historical statistics function of each interface.</li> <li>• nnGLinkConfigTable contains management information for each GigE Link. Allows the Manager to config and Manage these links.</li> <li>• nnGLinkFaultConfigTable maps Faults/Alarms to desired Severity. It allows manager to modify the alarmSeverity and to shutdown notification of these alarms, on each interface and for each Fault/Alarm type.</li> </ul> |

**Summary of new/changed Data Schema/MIBs information for SN08**

| Table or MIB name            | New or changed     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (continued)<br>ifEntry table | (continued)<br>New | (continued)<br>Feature A00007074 (UA-IP) creates the following MIBs: <ul style="list-style-type: none"> <li>nnGLinkThresholdTable allows the Manager to configure Performance Thresholds for which the Agent will generate a Threshold Notifications when the performance Counter (Type) is crossed.</li> <li>nnGLinkSoakTable allows the Manager to configure Performance Counter soak times/values</li> <li>nnGLinkProtGroupTable manages the Link Protection Group Configuration.</li> <li>nnGLinkOmCurrTable contains Operational Measurements per Link, with one entry per Link.</li> <li>nnGLinkOmIntervTable contains Operational Measurements per Link, with one entry per Link, 96 interval entries per Link,</li> </ul> |
| OFFICE_WIDE_DEFAULTS         | Changed            | Feature A00007213 (UA-IP) modifies this table as follows: one more entry is made in this existing database table to store Collection intervals.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| NORTEL-UEM-G-BASE.mib        | Changed            | Feature A00007213 (UA-IP) modifies this MIB to add the following attributes: <ul style="list-style-type: none"> <li>nnUemgOMStandardInterval</li> <li>nnUemgOMExtendedIntervalMulti</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| nnGLinkVLANTable             | New                | Feature A00007293 (UA-IP) creates this MIB to create, modify, and delete VLANs on the MG9K.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| nnCommunityOfInterest        | New                | Feature A00007415 (UA-IP) creates this MIB to support groupings of MG nodes into “communities of interest” (COI).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Commands and User Interface changes overview

The following Commands and/or User Interface are new or changed for SN08. More complete descriptions appear in the Feature Deltas section of this document.

| Affected Area                     | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = CS 2000</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| GWC Network Devices GUI (changed) | <p>Feature A89007809 (IAW, IAC) modifies the following GUIs:</p> <ul style="list-style-type: none"> <li>• Network Configuration Panel is extended to pre-provision the two new data entries: NAT devices and Media Proxy devices.</li> <li>• GWC Provisioning Panel adds a tabbed pane “<b>MediaProxy</b>” in order to manage association/disassociation to MGs.</li> <li>• Associate Media Gateway window allows the user to associate a NAT with a Media Gateway.</li> </ul> |
| GWC Network Devices GUI (changed) | <p>Feature A00002644 (IAW, IAC) modifies these NAT browser GUIs within the GWC Network Devices GUI:</p> <ul style="list-style-type: none"> <li>• Maintenance Settings Panel</li> <li>• Change Maintenance Settings Dialog</li> <li>• Network Devices Panel, NATs tab</li> <li>• Add NAT middlebox Dialog</li> <li>• Delete NAT confirmation Dialog</li> </ul> <p>This feature also adds the NAT middlebox ID display dialog GUI.</p>                                           |
| XML Commands (changed, and new)   | <p>Feature A00002644 (IAW, IAC) modifies the following XML commands:</p> <ul style="list-style-type: none"> <li>• queryNAT</li> <li>• addNAT</li> </ul> <p>This feature also adds the following XML commands:</p> <ul style="list-style-type: none"> <li>• queryCallAgentId</li> <li>• setCallAgentId</li> </ul>                                                                                                                                                               |

| Affected Area                      | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POLL CI command (changed)          | <p>Feature A00006226 (DMS) adds three new options to the POLL CI command:</p> <ul style="list-style-type: none"> <li>• POLL RESTORE_DEFAULTS allows the user to return the state of Table NTPOLL to its system default.</li> <li>• POLL DOSTEP xx allows the user to execute a single step from Table NTPOLL.</li> <li>• POLL DOSTEP xx allows the user to execute a single step from Table NTPOLL.</li> <li>• POLL PUSH (ON/OFF) allows the user to specify FTP storing of files on a remote system.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Call Forwarding for CEPT (changed) | <p>Feature A00006271 (DMS) makes available the activation, deactivation and interrogation of CFB per Key (Call Forwarding Busy per Key), CFD per Key (Call Forwarding Don't Answer per Key) and CFK (Call Forwarding Unconditional per Key) features based on the CEPT Dialing Sequence.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| CAPACITY MAPCI (changed)           | <p>Feature A00006693 (DMS, PT-AAL2) modifies the existing CAPACITY MAPCI level to provide a new IOCAP MAPCI level in XA-Core only. The new IOCAP level will provide IO utilization and IO messaging throughput information for HCMIC and HIOP IO cards. It includes the following new commands:</p> <ul style="list-style-type: none"> <li>• IOCAP--This new IOCAP MAPCI level will be giving the IO utilization values and messaging throughput information for each IO service type (CMIC, ETHR and AMDI). The information on this new MAPCI level will be updated once every minute.</li> <li>• QUIT--This new IOCAP QUIT command is available in XA-Core only and allows the user to exit IOCAP MAPCI.</li> <li>• IOMAX--This command displays the hourly high watermark value captured for each IO service type (CMIC, ETHR or AMDI). The value is captured every hour of day for the last 31 days. The data survives all types of restarts (warm, cold and reload).</li> <li>• IOAVG--This command displays the hourly average value captured for each IO service type (CMIC, ETHR or AMDI). The value is captured every hour of day for the last 31 days. The data survives all types of restarts (warm, cold and reload).</li> <li>• STATUS--This command displays all status information including current version of IOCAPCI tool, timestamp in terms of hour and minute, the current IO utilization values of all IO services (CMIC, ETHR, AMDI), the current value of the IO_WARNING_THRESHOLD office parm.</li> </ul> |

| Affected Area                                  | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (continued)<br><br>CAPACITY MAPCI<br>(changed) | (continued) <ul style="list-style-type: none"><li>• DISP--This command displays the utilization and messaging throughput values of each IO service type of the last 60 minutes with option CURR (for example, when a command is issued at 2:35, displayed data is from 1:34 to 2:34) or previous full hour with option PREV (for example when a command is issued at 2:35, displayed data is from 1:00 to 2:00). This information survives all types of restarts (warm, cold and reload).</li></ul> |

| Affected Area                                                           | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QDN, QLEN                                                               | Feature A00006780 (UA-IP, IAW, CHS) modifies these commands:                                                                                                                                                                                                                                                                                                                                                                          |
| QLT                                                                     | <ul style="list-style-type: none"> <li>Line Query Commands QDN and QLEN to add new field BEARER_NETWORK to the Command Output.</li> </ul>                                                                                                                                                                                                                                                                                             |
| QDNWRK<br>QLENWRK<br>QHASU                                              | <ul style="list-style-type: none"> <li>Line Query Command QLT is modified to display BEARER_NETWORK in the Command Output.</li> </ul>                                                                                                                                                                                                                                                                                                 |
| QGRP                                                                    | <ul style="list-style-type: none"> <li>Line Query Commands QDNWRK, QLENWRK, and QHASU are enhanced to include a mandatory query parameter called BEARER_NETWORK, and are modified to display the BEARER_NETWORK in the Command Output.</li> </ul>                                                                                                                                                                                     |
| QCUST commands                                                          | <ul style="list-style-type: none"> <li>Line Query Command QGRP output is enhanced to display against each Group member the information about the Bearer Network to which the member belongs.</li> </ul>                                                                                                                                                                                                                               |
| POST at PMLEVEL of MAPCI                                                | <ul style="list-style-type: none"> <li>Line Query Command QCUST output is enhanced to display the corresponding Bearer Network against each of the LENS. A new field <b>BEARER_NETWORK (record number 22)</b> is introduced in the QCUST command output against each LEN.</li> </ul>                                                                                                                                                  |
| POSTCLS at SPM level of MAPCI                                           | <ul style="list-style-type: none"> <li>POST command at the PMLEVEL of MAPCI introduces the Bearer Network (BN) parameter to create a posted set of PMs associated with a specific Bearer Network.</li> </ul>                                                                                                                                                                                                                          |
| POST at the TTP level of MAPCI                                          | <ul style="list-style-type: none"> <li>POSTCLS command at the SPM LEVEL of MAPCI is introduced to enable the craftsperson to post the SPMs by the node class type (such as DMSCP, SMG4, IWDPT, IWBRG). For an IW Bridge SPM (IWBRG), an optional parameter is provided to allow specifying the Network Bridge CLLI name. This command is not a MENU command option.</li> </ul>                                                        |
| QUERYPM for Posted PMs                                                  | <ul style="list-style-type: none"> <li>POST command at the TTP level of MAPCI introduces new parameter, BN, to refine posted set of the trunks by a specified bearer network. This command can be used only on a already created post-set using any of the existing post commands. This enables the craftsperson to use maintenance commands available at the TTP level on the trunk members of a specific bearer network.</li> </ul> |
| SPM MAP Display (changed)                                               | <ul style="list-style-type: none"> <li>The QUERYPM command is modified to include display of the Bearer Network information for the Posted PM.</li> </ul>                                                                                                                                                                                                                                                                             |
| NOTE: See also the additional notes on these commands on the next page. | <ul style="list-style-type: none"> <li>The MAP display for a posted SPM is modified to display the Bearer Network information for the SPM. For an IW Bridge SPM, the name of the Network Bridge is displayed. For an SMG4, DMSCP or DPT SPM, the Bearer Network is displayed.</li> </ul>                                                                                                                                              |

| Affected Area                                               | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (continued)<br>Display LTP level of<br>MAPCI<br><br>QOSSVER | (continued)<br>Feature A00006780 (UA-IP, IAW, CHS) modifies these<br>commands: <ul style="list-style-type: none"><li>• The display at the LTP level of MAPCI is enhanced to display the Bearer Network information associated with a posted line. "N/A" is displayed for Not Attached ISDN agents.</li><li>• The QOSSVER Command is provided to allow the craftsperson to identify which OSS interface impacting features in the current XACORE load will be activated by modifying the parameter, OSS_PROV_VERSION. An optional parameter, specifying the Succession Networks release, to identify the features associated with a particular release.<br/>Refer to the Office Parameters section for more information.</li></ul> |
| Notes on Commands<br>related to<br>A00006780                | <ul style="list-style-type: none"><li>• <i>Note 1:</i> For QDN, QLT, QGRP and QCUST commands, BEARER_NETWORK will not be displayed for LTIDs which are not attached to a LEN.</li><li>• <i>Note 2:</i> For Query Commands and MAP displays, the DISPLAY field of the table BEAR_NETWORKS is used to show the Bearer Network associated with the queried/posted agent.</li><li>• <i>Note 3:</i> For MAP displays for IW Bridge SPMs, the DISPLAY field of table NETBRIDGE is used to show the Network Bridge CLLI associated with the Posted SPM.</li></ul>                                                                                                                                                                        |



| Affected Area                                           | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NGSS Tomcat Web Server (changed)                        | <p>Feature A00006893 (UA-IP, PT-AAL2) modifies this GUI, which is an NGSS-specific management tool, as follows:</p> <ul style="list-style-type: none"> <li>• A new “Security” subfolder has been added to the Provisioning folder.</li> <li>• Under the “Security” subfolder a “Config Data” option has been added.</li> <li>• Clicking on the “Security Params” option brings up the Security Params configuration page.</li> <li>• Under the “Security” subfolder, a new “Certificates” subfolder has been added.</li> <li>• Under the “Certificates” subfolder, the “Server Certificate”, “Remote Trusted Certificate”, and “Add Remote Trusted Certificates” options have been added.</li> <li>• Clicking on the “Server Certificate” option brings up the Display Local Server Certificate page.</li> <li>• Clicking on the “Remote Trusted Certificates” option brings up the Certificates Provisioned page.</li> <li>• Clicking on the “Add Remote Trusted Certificates” option brings up the Add Trusted Certificate page.</li> <li>• Changes to the “Add Server” and “Modify Server” section of the SIP Gateway GUI allow for the provisioning of servers using the TLS protocol, in addition to the TCP and UDP protocols.</li> </ul> |
| Certificate Management Tool CLI Interface (changed)     | <p>Feature A00006893 (UA-IP, PT-AAL2) describes use of the certificate management tool that provides a common interface for provisioning certificates for use by Apache, Tomcat, and the NGSS Sip application. The tool provides the following functions:</p> <ul style="list-style-type: none"> <li>• Create a new self-signed certificate for the host.</li> <li>• Create a certificate signing request. The craftsperson would manually send the signing request to the Certificate Authority (CA) where it will be signed.</li> <li>• Provision a trusted certificate (CAcertificate) and a CA-signed certificate produced from the signing request.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| InterNodal Emergency Stand Alone for MG9K (new)         | <p>Feature A00006894 (UA-IP) provides the ability to make calls while in ESA for MG9K nodes. Telcos are also given the ability to provision a “Community of Interest” to define which MG9K nodes can make ESA calls between one another.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| IEMS System Backup Command Rejection Error Dialog (new) | <p>Feature A00006979 (PT-IP, UA-IP, IAW) creates this new GUI which presents the user with a general error dialog when the user attempts to perform actions which are incompatible with Synchronous Backup Restore Manager activity.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

| Affected Area                                 | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CLUI for Synchronous Backup Restore Manager   | Feature A00006979 (PT-IP, UA-IP, IAW) creates this CLUI to invoke the Synchronous Backup Restore Manager. Once the user has entered the CLUI, only Synchronous Backup Restore Manager Commands are available to the user.                                                                                                                                                                                                                     |
| Core Element Manager (CEM) patching (changed) | Feature A00007024 (PT-IP, UA-IP, IAC, PT-AAL2) modifies the patchid for CEM patches from 8 characters up to 32 alpha-numeric characters. It also modifies the patch file format to implement the incremental cumulative nature of CEM patching.                                                                                                                                                                                               |
| Gateway Profile Categories (new)              | Feature A00007071 (IAW) defines two categories of profiles for customer use: <ul style="list-style-type: none"> <li>Nortel profiles are built into CMT software, are automatically populated in the "Nortel" certificate directory, and are not user modifiable.</li> <li>Third Party profiles are defined and created by Nortel Interop personnel. These profiles are flexible within the bounds of predefined fields and values.</li> </ul> |
| Change Gateway GUI (changed)                  | Feature A00007071 (IAW) modifies this GUI by adding new item "Change gateway profile" in the pick list.                                                                                                                                                                                                                                                                                                                                       |
| Change GW Profile OSSGate command (changed)   | Feature A00007071 (IAW) modifies the Change GW command to remove the Change Protocol command and support Change Profile only. It now provides a new choice of "mgProfile." This functionality would be used to assign a different profile to an existing GW.                                                                                                                                                                                  |
| Get Certificate List OSSGate command          | Feature A00007071 (IAW) introduces two commands that can be issued via the OSSGate interface.                                                                                                                                                                                                                                                                                                                                                 |
| Get Certificate Data OSSGate command (new)    | <ul style="list-style-type: none"> <li>Get Certificate List provides a means to retrieve profiles that have been imported into CMT software. Valid profile names are returned in a list and can be used with the associate GW command.</li> <li>Get Certificate Data will list the certificate that was used to generate a profile. This Certificate can be used to understand datafill options when creating a new GW.</li> </ul>            |
| Access to PMDebug (changed)                   | Feature A00007101 (PT-IP, UA-IP, IAW, PT-AAL2) replaces the existing login mechanism for accessing the PMDebug on the GWC (telnet to GWC IP address, "gonow", or use serial port) with a user-id/password login system which has a standard look and feel.                                                                                                                                                                                    |
| GWC Directory (new)                           | Feature A00007120 (PT-IP, PT-AAL2) creates a new MAPCI interface to monitor the availability of Announcement, Conference, Lawful Intercept and Packet Media Anchor resources subtending from a particular GWC. Posts the GWC peripherals and provides commands for viewing the status of GWC peripherals. No maintenance actions, such as BSY and RTS, can be performed from this MAP level.                                                  |

| Affected Area                                 | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Core Element Manager (CEM) patching (changed) | Feature A00007121 (UA-IP, PT-IP) creates a new MAPCI level, BRGTMCE, which allows the craftsperson to post the information for the IW bridges associated with a specific SPM. The user view dynamic usage/state and can perform maintenance functions on these bridges such as BSY and RTS.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Command Line Interface of SSPFS (changed)     | Feature A00007282 (PT-IP, PT-AAL2) modifies the SSPFS CLI to provide an additional option to change the login retries limit value.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| USP GUI panel (changed)                       | <p>Feature A00007359 (PT-IP, UA-IP, IAC, IAW, PT-AAL2) modifies this GUI to support the delivery of USP security and audit logs to the IEMS syslog server. The user can provision the following parameters from the USP GUI panel to deliver the logs to syslog server:</p> <ul style="list-style-type: none"> <li>• Log-delivery Enable/Disable option.</li> <li>• Primary IP address of the IEMS server.</li> <li>• An optional backup/secondary IP address of the IEMS server.</li> <li>• Non-editable transport protocol used (i.e. UDP/TCP) to deliver the logs.</li> <li>• Non-editable port number [defaulted to 514].</li> <li>• Select the category of logs (i.e. security and audit logs) to be delivered.</li> </ul> |
| Network VCAC Provisioning                     | Feature A00007394 (CHS) introduces Network Virtual Call Admissions Control (Network VCAC), a Quality of Service (QoS) mechanism that allows the CS 2000 to cancel post-dial, pre-ringing calls that would overload a segment of the packet network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| New Platform Type value                       | Feature A00007404 (UA-IP, PT-AAL2) introduces a new platform type value of SCTY which can be queried as part of report generation from the NPM GUI or CLUI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| IAA modules GUIs (new)                        | <p>Feature A00007465 (IAC, DMS) creates the following GUIs:</p> <ul style="list-style-type: none"> <li>• Scheduler</li> <li>• RKS Output Destination--used to configure the downstream RKS pairs which the EMDA sends event messages as well as the protocol to use.</li> <li>• DF Output Destination--used to configure the downstream DF which the EMDA sends LI event messages as well as the protocol to use.</li> <li>• Global System Parameters--used to configure the NE providing the Accounting messages.</li> </ul>                                                                                                                                                                                                   |

| Affected Area                             | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IAA command (new)                         | Feature A00007465 (IAC, DMS) creates the <b>iaa_config</b> command which provides the user with a means to configure the IAA modules from the command line user interface (CLUI).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| GR70 functionality (changed)              | Feature A00007483 (DMS) provides a new means of securing GR740 TCP/IP connections between the OSS and the CBM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SDM Config level (changed)                | Feature A00007489 (DMS, PT-AAL2) modifies the SDM Config level by presenting a new configuration screen for selecting security servers.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| SDM maintenance (changed)                 | Feature A00007492 (DMS, PT-AAL2) eliminates the requirement to be the <i>root</i> user in order to do SDM maintenance procedures. Two new user groups are created to enable increased authorization granularity: <ul style="list-style-type: none"> <li>• <b>emsadm</b> for system administration</li> <li>• <b>secadm</b> for security administration</li> </ul>                                                                                                                                                                                                                                                                                                                     |
| SDM maintenance user level (changed)      | Feature A00007492 (DMS, PT-AAL2) adds two new commands and modifies others as follows: <ul style="list-style-type: none"> <li>• Dispuser (new) enables the operator to display all the users on the system or to display information about a specific user.</li> <li>• Dispgrp (new) allows the operator to display all the role groups, the user in a specific role group and the actions that a specific role group can do.</li> <li>• Add and change commands are modified so that now they prompt the user for each piece of information needed to create a user. The information asked for includes the following items: primary groups, groups, shell, and password.</li> </ul> |
| PCES CI (new)                             | Feature A00007648 (IAC) introduces a new CI which is used to provision PacketCable surveillances. Refer to the Configuration section of the feature for details on available commands.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| VERIFYLOAD command (new)                  | Feature A00007602 (DMS, PT-AAL2) introduces the VERIFYLOAD command to perform a signature check on the ESD load. The VERIFYLOAD command is packaged within the ESD load and is invoked manually from the command line.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Product = CS 2000 Compact</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| SAM21 EM 3PC provisioning Panel (changed) | Feature A00008431 (PT-IP, UA-IP, IAC, IAW, CHS, PT-AAL2) modifies this GUI which is used for provisioning a 3PC card by adding a new sub panel for provisioning GR backup WAN IP addresses.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Affected Area                                                         | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <b>Product = CS 2000 GWC</b>                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| GWC-EM Network Panel GUI (changed)                                    | Feature A00002512 (IAC, IAW) modifies this GUI by putting the existing three subsections into tabbed panes. VCAC Resource Usage data is provisioned via the new RU table in a fourth tab in the upper section. NATs are provisioned as before, except that the tab is renamed "IP-VPNs (Virtual NATs)" and a new field is added to provision a "Parent" (northbound neighbor) middlebox in the topology. LBLs are provisioned via a table in a new tab added to the central section of the Network Panel.                                                                                                                              |
| Gateway Controller Element Management GUI (changed)                   | Feature A00007102 (PT-IP, UA-IP, IAW, IAC, CHS, PT-AAL2) modifies this GUI with changes to the following panels: <ul style="list-style-type: none"> <li>GWC Network Display--modified to accommodate the C-Side IP addresses, which have been shifted here in respect of the requirement to have C-Side IP common to the entire network rather than to individual GWC's.</li> <li>GWC Display--modified in the "Controller" panel to remove the display for the Message Router IP address.</li> <li>Add GWC Node Interface--modified in the Add GWC Node Interface to remove the display for the Message Router IP address.</li> </ul> |
| New MAP level BRGMTCE                                                 | Feature A00007102 (PT-IP, UA-IP, IAW, IAC, CHS, PT-AAL2) introduces this new IW Bridge Maintenance MAP level to provide a method for deloading call processing from IW bridges. <b>Offl</b> , <b>Bsy</b> , <b>Rts</b> , <b>FrIs</b> , <b>Post</b> and <b>Next</b> commands will be provided at this command subdirectory.                                                                                                                                                                                                                                                                                                              |
| <b>Product = CS 2000 Management Tools</b>                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| SESM OSSGate configuration (changed)                                  | Feature A00006269 (PT-IP) modifies the OSSGate configuration interface so that the user has to manually configure to turn on the OSSGate Password Control option. Once this option is turned on, when attempting to login to OSSGate, it will prompt for the username first and then the password; the password being entered will not be displayed to the screen.                                                                                                                                                                                                                                                                     |
| Line Maintenance Manager and Trunk Maintenance Manager GUIs (changed) | Feature A00006570 (UA-IP, PT-AAL2) modifies both of these GUIs under "Set CS CLLI" in LMM and under "CM CLLI" for TMM to let the user input SDM IP instead of CM CLLI to transfer to another core server.                                                                                                                                                                                                                                                                                                                                                                                                                              |

| Affected Area                                                                                      | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| XML Commands (changed)                                                                             | <p>Feature A00007007 (IAC) modifies the following XML commands:</p> <ul style="list-style-type: none"> <li>• AssocMG adds new Input parameters usn, version, and ALGMiddleboxName; new output parameters usn, version, and ReturnCode.</li> <li>• QueryMG adds new output parameter ALGMiddleboxName</li> <li>• ChangeAssocALG adds new Input parameters usn, version, MGname, and ALGName; new output parameters usn, version, and ReturnCode.</li> <li>• GetALG is a command to retrieve ALG data.</li> <li>• QueryGWC is a command to query the GWC for the ALG connections.</li> </ul> |
| <p>Network Device GUI</p> <p>Change Gateway Association</p> <p>Associate Gateway GUI (changed)</p> | <p>Feature A00007007 (IAC) modifies the following GUIs:</p> <ul style="list-style-type: none"> <li>• Network Device has a new ALG tab leading to a new “Add ALG” panel.</li> <li>• Change Gateway Association is modified to allow the user to change from the current ALG Nat to a different ALG.</li> <li>• Associate Gateway adds the ALG option leading to a panel that allows input of the ALG name to be associated to the gateway.</li> </ul>                                                                                                                                       |
| Batch Provisioning Tool (changed)                                                                  | <p>Feature A00007072 (IAW) modifies this tool with new menu options to facilitate end-point bulk provisioning and a new option to facilitate converting query end-point operation output into add end-point operation input.</p>                                                                                                                                                                                                                                                                                                                                                           |
| CS2K Management Tools GUI (changed)                                                                | <p>Feature A00007072 (IAW) modifies this GUI with changes to the “Associate Media Gateway” dialog box to support provisioning of the frame and unit numbers and the LGRPLOC information as part of LGRPOPTS (LGRP OPTions).</p>                                                                                                                                                                                                                                                                                                                                                            |

| Affected Area                                               | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Gateway Controller Element Management (GWCEM) GUI (changed) | <p>Feature A00007242 (IAW, IAC, CHS) modifies this GUI with changes to the following panels:</p> <ul style="list-style-type: none"> <li>• Network Devices Panel</li> <li>• Network Devices Panel, NATs tab</li> <li>• Network Devices Panel, LBLs tab</li> <li>• Add/change/delete NAT Dialogs</li> <li>• Add/change/delete LBL dialogs</li> <li>• change adjacent MB dialogs</li> <li>• change root mb dialogs</li> </ul> <p>It also creates the following sub-panel GUIs:</p> <ul style="list-style-type: none"> <li>• SPC provisioning network panel</li> <li>• Add/change/delete SPC dialogs</li> <li>• Network Zone tabbed Panel</li> <li>• Composite NAT/LBL zone tabbed Panel</li> <li>• Add/change/delete composite NAT/LBL zone dialogs</li> </ul> |
| XML Command (new)                                           | Feature A00007242 (IAW, IAC, CHS) creates the XML commands to Add/Change/Delete/Query Network Zone.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| SIP messaging (changed)                                     | Feature A00007275 (PT-IP, PT-AAL2) implements light-weight thread-safe message queues for communicating between SIP Gateway Application threads, replacing the Unix Sockets and Inter-Process Communication (IPC) Message Queues used in Session Server Release 07. These new Message Queues provide the framework to make thread recovery and overload controls possible.                                                                                                                                                                                                                                                                                                                                                                                  |
| CS2K Mgmt Tools GUI (changed)                               | Feature A00007300 (PT-IP, UA-IP, CHS, PT-AAL2) modifies this GUI so the IPSec provisioning tab is now available for all GWC profiles.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| SAM21 EM GUI (changed)                                      | Feature A00007564 (UA-IP, PT-AAL2) modifies the “Equip” panel to include support for the MCPN 905 card.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SAM21 EM GUI (changed)                                      | <p>Feature A00007927 (UA-AAL1) modifies this GUI as follows:</p> <ul style="list-style-type: none"> <li>• change the label of “Administrative” to “Card Status” in every card view on SAM21 EM GUI</li> <li>• change the behavior of the EM on pulling/inserting the NSS card: if a Locked/Disabled NSS card is pulled, when it is re-inserted, the card will come back in Locked/Disabled status. However, if an Unlocked/Enabled NSS card is pulled, when it is re-inserted, SAM21 EM will automatically unlock this card.</li> </ul>                                                                                                                                                                                                                     |



| Affected Area                             | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <b>Product = CS 2000 TOPS</b>             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| TOPSPOS POST command (changed)            | Feature A00007713 (PT-IP, DMS) modifies POST command under TOPSPOS to add parameter AC which creates a post set of all in-service IP positions with voice auto-compression turned on. The listset command is then used to display the position list.                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Product = CICM</b>                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| CICM EM system status page (changed)      | Feature A00003953 (CHS) modifies the “virtual media gateways” section of this GUI so that the states are no longer displayed as In Service, Out of Service, Hot Standby, or Stopped. Instead, it now splits the active vs. inactive state of the component from the overall VMG state to make things clearer and more explicit. On the maintenance page, the “VMG status” combines this information into a summary and now reports the status as one of these: Active (in service), Active (out of service), Inactive (in sync), Inactive (out of sync), Swacting master to slave, Swacting slave to master, or Stopped.                                                                  |
| CICM EM maintenance status page (changed) | Feature A00003953 (CHS) modifies this GUI as follows: <ul style="list-style-type: none"> <li>• The “Node status” field is renamed as “Status.”</li> <li>• A new “VMG status” field shows the current state of the virtual media gateway component on the node in question.</li> <li>• Related to the VMG and just beneath it is the “Active half calls” field.</li> <li>• Similarly, the “Terminals status” field shows the overall state of this component</li> <li>• When the Terminals component on the node is active, two other fields appear: active terminals, and Logged-in users.</li> <li>• During a SWACT, a “Terminals recovered” field appears to track progress.</li> </ul> |
| GWC-EM Gateways GUI (changed)             | Feature A00004981 (IAW, IAC) modifies this GUI to display the rootMiddleboxes that are provisioned against the CICM gateways and modifies these sub-panels: <ul style="list-style-type: none"> <li>• Associate Media Gateway Dialog, modified to display a new internet transparency panel when a CICM gateway has been selected.</li> <li>• Change Gateway Dialog, modified to allow the user to modify (or remove) the Root Middleboxes associated with an already provisioned CICM gateway.</li> </ul>                                                                                                                                                                                 |



| Affected Area                    | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| XML Commands (changed)           | <p>Feature A00004981 (IAW, IAC) modifies the following XML commands:</p> <ul style="list-style-type: none"> <li>• AssocMG, to allow/display root middleboxes.</li> <li>• ChangeRootMiddleBoxes, new interface added.</li> <li>• QueryMG, to allow/display root middleboxes.</li> </ul>                                                                                                                                                                                                                                                                                                 |
| <b>Product = Integrated EMS</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| IEMS Client GUI (changed)        | <p>Feature A00006756 (UA-IP) modifies the CreateUser Wizard to prompt for additional User Attributes, such as descriptive text about the user, days required between password changes, when the warning appears before password expiration, allowed days of inactivity before the account is disabled, and the login shell that is invoked after a successful login.</p>                                                                                                                                                                                                               |
| IEMS Secure Launch to PP8600     | <p>Feature A00006757 (UA-IP) defines security measures to be applied to communications between Succession management applications (IEMS and JDM) and the Passport 8600 Routing Switch. Configuration procedures are provided.</p>                                                                                                                                                                                                                                                                                                                                                      |
| IEMS Secure Launch to PP8600     | <p>Feature A00006759 (UA-IP) explains the functional details of X11 Port Forwarding for MDM in IEMS.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| CEM integrated to IEMS (changed) | <p>Feature A00007304 (UA-IP) covers the installation of the CEM server onto the IEMS server and installation of the CEM components on the SDM and CBM.</p>                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MS2000 CLUI (changed)            | <p>Feature A00007341 (UA-IP, PT-AAL2) migrates the existing functionality of the MS2000 CLUI to reside on the IEMS platform. The following is newly added for SN08:</p> <ul style="list-style-type: none"> <li>• The MS2000 EM will make use of the existing IEMS audit logging functionality to provide a log of what user issued a command against an MS2000 node.</li> <li>• The MS2000 EM will make use of the existing IEMS alarming system to generate an alarm against the EM whenever a configuration of maintenance action by the EM has an unrecoverable failure.</li> </ul> |

| Affected Area                                                          | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| MDM Manager GUI on IEMS (changed)                                      | <p>Feature A00007345 (UA-IP) modifies the MDM Manager GUI within IEMS as follows:</p> <ul style="list-style-type: none"> <li>• New menu item “MDM Operator Client GUI” is available on the right click of the Map Symbol of Preside MDM Mgr.</li> <li>• New menu item “Legacy MDM Tools” is available on the right click of the Map Symbol of Preside MDM Mgr. Since “LegacyMDMTools” has the same functionality of “MDM GUI Mgr”, the menu “MDM GUI Mgr” is disabled in SN08.</li> <li>• New menu item “Command Line” is available on the right click of the Map Symbol of Preside MDM Mgr which initiates one-step login between the IEMS Client and the Preside MDM Server.</li> </ul>                                                                                                                                                                                                                                                                             |
| MCS System Manager and MCS Fault Performance Manager on IEMS (changed) | <p>Feature A00007346 (UA-IP) modifies the MCS System-related GUIs within IEMS as follows:</p> <ul style="list-style-type: none"> <li>• System Managers are shown under the “Element Manager” node of the topology tree. Logical System Managers are parents to Physical SMs.</li> <li>• An independent MCS system may be managing an RTP Media Portal in which case the parent object representing the entire MCS System will be an RTP Media Portal object in the “Network Elements” folder.</li> <li>• The “Add EM” GUI allows the user to select a Simplex or Duplex MCS System which then prompts for either 1 or 2 IP addresses, respectively. It also allows the user to provision an FPM and associate it to a known MCS SM.</li> <li>• A new device called the Fault Performance Manager (FPM) is introduced in SN08. This will supplement the MCS SM in very large COs. The FPMs that supplement the SM will need to be added manually into IEMS.</li> </ul> |
| IEMS alarm properties (changed)                                        | <p>Feature A00007347 (UA-IP) adds a new alarmClear property in the IEMS Alarm Properties Dialog to identify manually clearable and non clearable alarms.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| IEMS Performance interface (changed)                                   | <p>Feature A00007388 (UA-IP) adds triggering support to the IEMS Performance interface to speed data collection, reports, and transfer to OSS. Report jobs can be run from a scheduled mode or a triggered mode based on the collection job. Transfer jobs can occur from a scheduled mode or a triggered mode based on the report job.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| Affected Area                                         | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
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| IEMS Performance interface enhanced GUI (changed)     | <p>Feature A00007388 (UA-IP) provides enhanced GUI support as follows:</p> <ul style="list-style-type: none"> <li>• Current Measurement Collection job display includes the status of the current/previous collection activity and the scheduled time of the next collection (if applicable).</li> <li>• The display of Current Measurement Transfer job should also include the status of the current/previous transfer activity and the scheduled time of the next transfer (if applicable).</li> <li>• The display of current Measurement Report jobs should also include the status of the current/previous report job activity and the scheduled time of the next report generation (if applicable).</li> </ul>                                         |
| IEMS Performance Metrics Collection Job GUI (changed) | <p>Feature A00007388 (UA-IP) enhances the IEMS Performance Metrics Collection Job GUI as follows:</p> <ul style="list-style-type: none"> <li>• If the selected device type is an SNMP-collection-based device, then the bottom part of the panel asks for associated Template Name.</li> <li>• If the selected device type is a CSV-collection-based device (MAS or MCS), then the bottom part of the panel asks for the Directory Name and the File Name.</li> </ul>                                                                                                                                                                                                                                                                                        |
| MFT Backend Security Add Group Wizard (changed)       | <p>Feature A00007785 (UA-IP) enhances the MFT Backend Security Add Group Wizard as follows:</p> <ul style="list-style-type: none"> <li>• The administrator may manually provide a GID for the newly created group. If a value is not provided in the GID field, IEMS will pick a value from the range <b>specified</b> in the configuration file.</li> <li>• <b>Only</b> members of the “secadm” group have access to IEMS Security Client GUI. This applies to JWS Client and the HTML Client. SN07 users who are present in emsadm group will be automatically be provisioned in secadm group in SN08 during the upgrade process. In SN08 all group names must be 8 characters or less and consist of lowercase letters or numeric digits only.</li> </ul> |
| MFT Backend Security (changed)                        | <p>Feature A00007785 (UA-IP) adds a new authorization group, secadm, whose members can perform the following Security Administration functions:</p> <ul style="list-style-type: none"> <li>• Adding/Deleting/Users.</li> <li>• Adding/Deleting/Modifying Groups</li> <li>• Modifying user profiles</li> <li>• Modifying IEMS system security settings</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                             |

| Affected Area                                    | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| MFT Backend Security Add User Wizard (changed)   | <p>Feature A00007785 (UA-IP) enhances the MFT Backend Security Add User Wizard as follows:</p> <ul style="list-style-type: none"> <li>In the second screen the account expiry is now an absolute date, not number of days from user creation. Also, the password expiry field now indicates how often (number of days) the user password will expire and not how soon the next password expiry will occur.</li> <li>In the Advanced properties screen (from the “Advanced” button on the third screen) the following additional user attributes are now present: <ul style="list-style-type: none"> <li>UID is a read-only UID value for existing accounts.</li> <li>GID is selected from a drop-down menu. The default primary GID is “succssn” for all users added.</li> <li>GECOS can accept any information, such as the actual full name of the user.</li> <li>LoginShell allows the administrator to select “no-access” or “restricted” options for each user.</li> <li>Home Directory depends on the Login Shell selected.</li> <li>MIIN is the minimum number of days required between password changes.</li> <li>Password Expiry Date is a read-only field which will indicate the absolute date on which the current password for the user expires</li> <li>LastChange shows the absolute date on which the password was most recently changed.</li> </ul> </li> </ul> |
| Configuring RADIUS secret through IEMS (changed) | <p>Feature A00007786 (UA-IP) provides an overview of configuring RADIUS secret through IEMS client in one step. All provisioning of RADIUS device parameters including add, modify and delete will be supported while the RADIUS Server is running. The RADIUS device types supported for SN08 are IEMS, MG9k, Passport and PP8600.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Product = MG 9000</b>                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| MG9K security (changed)                          | <p>Feature A00005561 (UA-IP) implements IP security and user authentication capabilities on the MG9K to ensure that all users are validated before access is granted, and that all IP traffic between the MG9K and a remote peer (Element Manager or Gateway Controller) is authenticated through a RADIUS client/server network. The MG9K Security parameters can be configured from the LCI at initial commissioning or from the Element Manager.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| Affected Area                                                                                                                                 | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| IPSec for MG9K EM (changed)                                                                                                                   | Feature A00005646 (UA-IP) implements IPSec for MG9000 Element Manager to MG9000 Line Gateway OAMP communications. The craftsperson will be able to independently manage IPSec parameters for all OAM&P communications to and from MG9000 network elements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Security View GUI for MG9K EM (new)<br><br>Office Wide Defaults View GUI for MG9K EM (changed)<br><br>SLOA GUI<br><br>SSPFS Security web page | <p>Feature A00005646 (UA-IP) creates a new Security View GUI available from the MG9000 EM subnet. This GUI will manage the IPSec (and Internet Key Exchange) configuration file(s) that are used to set up security associations, keys, and protection mechanisms.</p> <p>This feature also modifies the Office Wide Defaults View to support IPSec. This will enable the customer to configure one set of IPSec parameters and have them applied to all, or a subset of, the provisioned MG9000s. The three parameters are Security OFF/ON, IKE preshared key, IKE time to live.</p> <p>The SLOA GUI is used to define security parameters to be used in securing the call control link between the VMG and the gateway controller. Added to the GW Controller Config tab will be a section for Security with parameters of Security OFF/ON or OfficeWide Default, IKE preshared key, IKE time to live.</p> <p>The SSPFS Security web page is used to define security parameters to secure communications into and out from this SSPFS Machine. This includes MG9000 Element Manager to MG9000 OAM&amp;P communications.</p> |
| Passport 15K for ESA on MG9K (changed)                                                                                                        | Feature A00006894 (UA-IP) describes the configuration and provisioning needed for ESA for MG9K. The inter-MG9000 communication will be provided by the Passport 15000 switch, using the Virtual Router capability to route the IP-based ESA traffic between MG9K gateways.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| DCC and ITP cards                                                                                                                             | Feature A00006906 (UA-IP) introduces the capability for the NY45FA GiGE DCC circuit pack to connect to an International standard Synchronization Supply Unit (SSU) using 2048kHz interfaces. The NY45FA can use an SSU or BITS signal as a timing reference.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| IPSec for MG9K EM (changed)                                                                                                                   | Feature A00006906 (UA-IP) introduces the capability for the NY45FA GiGE DCC circuit pack to connect to an International standard Synchronization Supply Unit (SSU) using 2048kHz interfaces. The NY45FA can use an SSU or BITS signal as a timing reference.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

| Affected Area                                                   | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| GIGE GUIs (new)                                                 | <p>Feature A00007000 (UA-IP) introduces the following GUIs:</p> <ul style="list-style-type: none"> <li>GigECardView--Each SCG card has four ports. The card view can be opened from the shelf view. The card view shows totally four ilog graphics for the ports. Clicking on each of them opens the GigePortView.</li> <li>GigEPortView--The GigePortView will be opened when the user double clicks on the SCG card's port icon in the card view. The port view displays port/link attributes and its provisioning information.</li> <li>GigELinkProtection--The Link protection can be invoked from the shelfview. The user will be able to specify the protection group number, protection group type, working (preferred) link and protected (non-preferred) link. In SN08, only one protection group of type 1:1 is supported.</li> <li>BandWidthManager--. The bandwidth manager panel can be viewed from the Services submenu. The following network interface bandwidth data will be monitored: current ITP voice usage, current ABI voice usage and Overall network interface utilization. The data will be displayed in bits/second for GIGE systems. Bandwidth partitioning will also be supported in GIGE.</li> <li>VLAN--VLAN provisioning data is accessed from the 'VLAN provisioning' view in the shelf view. There are a total of four VLAN IDs in SN08 release.</li> <li>LinkIntegrityView--The Link Integrity test can be invoked from the shelfview Maintenance submenu 'Link Integrity View'. The link integrity test will be run on a protection group.</li> </ul> |
| GIGE GUIs (changed)                                             | <p>Feature A00007000 (UA-IP) modifies the Performance Browser GUI to introduce Generic OM, Ethernet OM, RMON and PM data. The SMON data related to the VLAN is also displayed in the performance browser.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| MG9K EM GUI (changed)                                           | <p>Feature A00007140 (UA-IP, PT-AAL2) modifies the "MG Upgrade Wizard" portion of this GUI during a nodal upgrade as follows:</p> <ul style="list-style-type: none"> <li>The wizard asks the user if the EM should perform a "prep download" or a "complete upgrade".</li> <li>"XDSL Cards" and "MTA Cards" are added as choices in the "Card Type Selection" panel.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| GWC Upgrade Tool GUI (new)<br><br>CallServer Upgrade Tool (new) | <p>Feature A00007140 (UA-IP, PT-AAL2) creates a new GWC Upgrade Tool GUI and a new CallServer Upgrade Tool GUI. The tools provide a pure CLI for the customer or upper-level coordinator to invoke upgrade functionalities, plus an interactive CLUI for easy use of the tools.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Affected Area                            | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| Configure Collection Interval (new)      | Feature A00007213 (UA-IP) introduces this GUI to configure Sample and Summary intervals uniformly for all the MG9Ks in a Subnet.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Performance Statistics Browser (changed) | Feature A00007213 (UA-IP) modifies this GUI so that the two date range fields also show dates in steps of 5 minutes, in addition to the existing displays of 15 minutes and 1 day.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Performance Measurements (changed)       | <p>Feature A00007213 (UA-IP) modifies the following information elements in SN08:</p> <ul style="list-style-type: none"><li>• Collection Interval: Periodic collection interval may be configured to a combination of Sample and Summary intervals. In SN08, “5/30 Minutes” and “15 Minutes” are supported.</li><li>• OSS delivery (and interface) or Local only: OM Collector sends appropriate CORBA notification whenever it succeeds or fails to generate CSV file.</li><li>• OSS Collection Interval: As and when CSV file is generated, OM Collector sends a CORBA notification. OSS can use appropriate mechanism to collect CSV file as and when it receives this notification.</li><li>• File Name: Directory wherein CSV are generated, are configurable in SN08.</li></ul> |

| Affected Area                              | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GigE Network Interface (changed)           | <p>Feature A00007263 (UA-IP) modifies the LCI software to support the new Gigabit Ethernet Network Interface for MG9K. Modifications include the following:</p> <ul style="list-style-type: none"> <li>• Card maintenance of the SCG card</li> <li>• Carrier maintenance – where the GigE link can be: <ul style="list-style-type: none"> <li>— Provisioned – also includes the ability to request for auto-negotiation.</li> <li>— Controlled – the admin and config state of the links can be controlled.</li> <li>— Status can be viewed – the alarm(s) on the links will be displayed.</li> <li>— Perform OOS (Out of Service) test and monitor Link-Integrity.</li> <li>— Have Link Protection – to be able to set the working (preferred) and non-working (non-preferred) links and also enable/disable link-reversion.</li> </ul> </li> <li>• Connection side changes -- VLAN – to be able to provision (set the VLAN ids.), shape (set the peak rate) and also prioritize the different types of VLANS (OAMP, Bearer, Call-Control and for the fixed IP addresses of the SCG cards) from the connections button on the LCI.</li> <li>• Dynamic updating of the alarm severities at the N.E and Net.Carrier links on LCI.</li> <li>• Update several terms applicable to GigE.</li> </ul> |
| Internodal ESA Configuration (new)         | <p>Feature A00007415 (UA-IP) creates this GUI to allow the customer to configure communities of interest. Internodal ESA allows groupings of MG nodes into “communities of interest” (COI). All nodes in a community can communicate with each other during ESA, allowing calls to complete inside the community during ESA.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Line Coefficient View (changed)            | <p>Feature A00008387 (UA-IP) modifies this GUI to display the Line Coefficient information in a table format. It also adds 8 new fields: PEC, Country Info, CRAM, Vinetic version, Loop Info, Metering, Service Type, and Default.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Bulk Provisioning Service Types View (new) | <p>Feature A00008387 (UA-IP) creates this GUI to bulk provision all the line circuits on a GLC card to the same service type. This GUI is only enabled when the card is deprovisioned.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



| Affected Area                                                         | Command/User Interface Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = Network Patch Manager (NPM)</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>PFRS configuration (changed)</p> <p>NPM GUI and CLUI (changed)</p> | <p>Feature A00006901 (PT-IP, UA-IP, IAC, PT-AAL2) makes the following changes:</p> <ul style="list-style-type: none"> <li>• Moves PFRS configuration from the CLI tool into the NPM GUI and CLUI.</li> <li>• The user may now set up the PFRS drop box information via a preferences window in the NPM GUI and via a preferences command in the NPM CLUI.</li> <li>• The user may also execute a PFRS GENREPORT and a PFRS GETPATCH on demand through the NPM.</li> <li>• The user may also execute a PFRS GENREPORT and a PFRS GETPATCH on demand through the NPM.</li> <li>• This feature also provides new functionality for the PFRS user. The user can now decide if they would like the NPM to “clean up” or delete patches from the drop box that have been transferred to the NPM after the PFRSGETPATCH task has been executed.</li> <li>• The NPM GUI has been modified to include a new “View” button on specific NPM GUI panels and a new PatchFile Retrieval Preferences tab as part of the Preferences GUI.</li> <li>• System defined information in the NPM GUI can now only be viewed and cannot be edited.</li> <li>• A new refine or filter button will be available on the NPM GUI which will allow the user to quickly determine which patch(es) are applicable to which device(s) and vice versa.</li> <li>• A process monitor has been added to the NPM GUI which will provide a visual indicator to the user that a submitted request is in progress. This monitor will be specific to each instance of the NPM GUI and will not indicate activity of multiple GUIs.</li> <li>• The CM CLLI will appear on each NPM GUI window. This will provide clarification when the user is performing patching operations on multiple offices.</li> </ul> |

### Servord changes overview

The following Service Order items are new or changed for SN08. More complete descriptions will appear in the Feature Deltas section of this document.

| Area                     | New or changed | ServOrd Description                                                                                                                                                                                                                     |
|--------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = CS 2000</b> |                |                                                                                                                                                                                                                                         |
| OPTION                   | New prompt     | Per feature A00006731 (DMS), new line option EOF can be assigned to an LCC of IBN, enabling the subscriber on the assigned line to exit on flash.                                                                                       |
|                          | New prompt     | Feature A000059039138 (DMS) creates a new SERVORD prompt called MWT_ANNOUNCEMENT.                                                                                                                                                       |
| ADO command              | Changed        | Feature A00007244 (UA-IP, IAW) allows the assignment of options GIC (group intercom) and/or GIAC (group intercom all call) to a Meridian Business Set (MBS) using the ADO command.                                                      |
| ADO command              | Changed        | Feature A00007253 (UA-IP, IAW) allows the addition of MADN Ring Forward to an existing SCA MADN line using the ADO command. The system prompts the end user for the MRF_RING option to assign special ringing to the MADN group member. |

### Office Parameter changes overview

The following office parameters are new or changed for SN08. More complete descriptions will appear in the Feature Deltas section of this document.

#### Summary of new/changed Office Parameters for SN08

| Status                   | Name                     | Description                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = CS 2000</b> |                          |                                                                                                                                                                                                                                                                                                                                                                                        |
| New                      | IO_WARNING_THRE<br>SHOLD | Feature A00006693 (DMS, PT-AAL2) creates this parameter in Table OFCENG to define a utilization warning threshold for all IO service types (CMIC, ETHR, AMDI) in the system. The IOCAP monitoring toolset uses the value of this parameter to peg the IOTHRESH register of the IOCAP OM whenever the IO utilization level of any IO service has exceeded this threshold on the switch. |

**Summary of new/changed Office Parameters for SN08**

| Status                        | Name                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| New                           | OSS_PROV_VERSION         | <p>Feature A00006780 (UA-IP, IAW, CHS) creates this parameter in Table OFCVAR to enable/disable the Line Query Commands enhancements. The default value is always SN07, which ensures that the user needs to explicitly change the value from SN07 to any other value in the permitted range of values, to get access to functionality provided by feature code which enhances Line Query Commands. In the process, the Warning messages the user gets will ensure that the new functionality is enabled, only after upgrading the OSS software for the switch to be in sync with the command enhancements.</p> <p>Refer to the section on Commands/User Interface for more information on the QOSSVER command.</p> |
| Changed                       | SITELABEL                | <p>Per CR Q00720293, SITELABEL in Table OFCVAR now obtains the SWREL value from the actual product load of the switch. This value is not transferred with an ONP. The NCSxx/UCSxx names are no longer used for the actual load names. They are now all SNxx. The value can be observed by using the command IMAGENAME.</p>                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Product = CS 2000 TOPS</b> |                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Deleted                       | (See description column) | <p>Feature A00007271 (PT-IP) verifies that office parameters LANG_ERROR_SCREEN_DISPLAY, ADAS_ENABLE, and DA_BP_HOTEL_ROOM_REQUIRED were deleted in SN08, and that office parameters OPR_0PLUS_3RD_DISPLAY, OPR_0PLUS_COL_DISPLAY, OPR_0PLUS_3RDCON_DISPLAY, OPR_0PLUS_CLDCON_DISPLAY, TOPSACD_DASERV_INSTANCE, and TOPSACD_INTCSEV_INSTANCE were deleted in SN08.</p>                                                                                                                                                                                                                                                                                                                                               |

### OM/PM changes overview

The following OMs/PMs are new or changed for SN08. They also appear in the OMs/PMs-by-product tables later in this document with lists of registers and descriptions.

#### Summary of new or changed OMs/PMs for SN08

| OM Group or PM name               | New or Changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = Call Server 2000</b> |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| MNGEMLNK<br><br>MNGEMTRF          | New            | <p>Feature A00004741 (PT-IP, UA-IP) creates the following OM groups for IW-IP nodes:</p> <ul style="list-style-type: none"> <li>• MNGEMLNK (Multiservice Node Gigabit Ethernet Module Link Bandwidth Engineering) provides Gigabit Ethernet Link usage statistics to assist with network bandwidth Engineering. In this OM group, the pegs include: <ul style="list-style-type: none"> <li>— The number of packets/octets transmitted/received on the Gigabit Ethernet Link connected to a MG4K-IP/IW-IP node.</li> <li>— The number of packets/octets transmitted/received with different types of error.</li> </ul> </li> <li>• MNGEMTRF (Multiservice Node Gigabit Ethernet Module Traffic Engineering) provides statistics of Nodal traffic usage. In this OM group, the pegs include: <ul style="list-style-type: none"> <li>— The number of RTP packets/octets transmitted/received for bearer traffic.</li> <li>— The number packets/octets transmitted/received for different types of connections.</li> </ul> </li> </ul> |
| IOCAP                             | New            | Feature A00006693 (DMS, PT-AAL2) creates OM group IOCAP to provide information on IO capacity such as utilization and utilization high watermark and IO throughput information on a per IO service type (CMIC, ETHR and AMDI).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

**Summary of new or changed OMs/PMs for SN08**

| OM Group or PM name                  | New or Changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRK2NET1<br>TRK2NET2                 | Changed        | Feature A00006780 (UA-IP, IAW, CHS) enhances OM groups TRK2NET1 and TRK2NET2 so that tuples are allocated for all bearer networks provisioned in table BEARNETS for each Trunk Group datafilled in table TRKGRP, even if there are no Trunk Members against the Trunk Group in a bearer network. This results in pegging attempts to access a trunk member of a bearer type which is not provisioned in order to assist in engineering of multi-bearer trunk groups.                                                                                                                            |
| PKTMA                                | New            | Feature A00007120 (UA-IP, PT-AAL2) introduces OM group Packet Media Anchor (PKTMA) with three registers to track usage counts for Dynamic Packet Trunk Anchor resources on a GWC basis.                                                                                                                                                                                                                                                                                                                                                                                                         |
| DPTOFC<br>DPTNODE<br>DPTOFCP         | Changed        | Feature A00007135 (UA-IP) enhances OM groups DPTOFC, DPTNODE, and DPTOFCP as follows: <ul style="list-style-type: none"> <li>For registers DPTNODE::DPTGTAT and DPTOFC::DPGTAT/DPGTAT2, the pegging is changed such that both the nodal level and the office level are counted at the same point (except in cases where the code exits prior to knowing a particular node).</li> <li>The DPTOFC::DPGTFLO/DPGTFLO2 registers &amp; DPTNODE::DPTGTFLO registers will be changed such that failed optimized attempts on nodes "not DPT-enabled" are not pegged against these registers.</li> </ul> |
| TRK<br>TRNK2<br>TRK2NET1<br>TRK2NET2 | Changed        | Feature A00007135 (UA-IP) clarifies the use of register MAXBU in DPT trunk groups. Register MAXBU is effectively disabled for DPT trunk groups. The value of the MAXBU register for a DPT trunk group will always be equal to zero. The MAXBU register was designed to be used with non-DPT trunks. The DPTOFC and DPTNODE usage registers and high water registers are directly applicable to DPT trunks and should be used in the place of the MAXBU register.                                                                                                                                |

**Summary of new or changed OMs/PMs for SN08**

| OM Group or PM name                                 | New or Changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PCEM                                                | New            | <p>Feature A00007196 (IAC) introduces OM group Packet Cable Event Messaging (PCEM) which pegs a success or failure for every event message generated by the core for Accounting with the following registers:</p> <ul style="list-style-type: none"> <li>• EMENT--Event message successfully generated.</li> <li>• EMFAIL--Failed to build event message.</li> <li>• EMSYSFL--System unable to send event message.</li> <li>• EMENT2--Overflow register for EMENT</li> <li>• EMFAIL2--Overflow register for EMFAIL.</li> <li>• EMSYSFL2--Overflow register for EMSYSFL</li> </ul>                                                                        |
| SIPGW_CALL<br>P<br>SIPGW_SERV<br>ICES<br>SIPGW_MISC | Changed        | <p>Feature A00007268 (PT-IP, PT-AAL2) enhances these OM groups to track measurements based on SIPLINK. It also enhances OMSHOW to support querying of OM peg counts based on tuples.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| SIPGW_CALL<br>P                                     | Changed        | <p>Feature A00007270 (PT-IP, PT-AAL2) adds new register OVRLD_CALLS_REJECTED to this OM group to track the number of incoming calls that are rejected due to SIP CallP being in overload.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Session Policy<br>Controller<br>(SPC) OMs           | New            | <p>Feature A00007393 (CHS) creates the following OM:</p> <ul style="list-style-type: none"> <li>• SPC Reservation Request--records reservation request events on the SPC signaling interface.</li> <li>• SPC Commit Request--records commit request events on the SPC signaling interface.</li> <li>• SPC Deletion Request--records deletion request events on the SPC signaling interface.</li> <li>• SPC CallP--records SPC CallP OM.</li> <li>• Topology Update--records topology update event in the topology manager.</li> <li>• CAC Request on Network Segment--is a per-instance OM that records CAC requests to each network segment.</li> </ul> |

## Summary of new or changed OMs/PMs for SN08

| OM Group or PM name | New or Changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IAA modules OMs     | New            | <p>Feature A00007465 (IAC, DMS) creates the following OMs:</p> <ul style="list-style-type: none"> <li>• Records In</li> <li>• Records Out</li> <li>• Channel Type (EMDA Module Only)</li> <li>• Channel ID (EMDA Module Only)</li> <li>• Events Sent (EMDA Module Only)</li> <li>• Acknowledgements Received (EMDA Module Only)</li> <li>• Events Retransmitted (EMDA Module only)</li> <li>• Events Written to File (EMDA Module only)</li> <li>• Events Rejected (EMDA Module Only)</li> <li>• Last Event Message Header Sequence Number (EMDA Module Only)</li> </ul>                                             |
| UNBMISC             | Changed        | <p>Feature A00007548 (IAC) describes these registers that are used by PCES:</p> <ul style="list-style-type: none"> <li>• RELCPCTY counts the number of monitored calls for which monitoring was stopped because monitoring capacity is exceeded.</li> <li>• RELNMON counts the number of calls for which monitoring was stopped because of non-monitorable features. <b>All features supported by the CS2K PacketCable solution are monitorable.</b></li> <li>• UNBMCALL counts the number of calls monitored by USNBD. Register UNBMCALL determines the real-time impact monitored calls make on the CM.</li> </ul> |
| TRK                 | Changed        | Feature A00008350 (PT-IP, PT-AAL2) adds new register MIDFAIL to provide established bearer path failure counts on a per-trunk group basis.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| TRNK2               | Changed        | Feature A00008350 (PT-IP, PT-AAL2) adds new register MIDFAIL2 as an extension register of MIDFAIL.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| TRK2NET1            | Changed        | Feature A00008350 (PT-IP, PT-AAL2) adds new register MIDFAIL3 to provide established bearer path failure counts on a per-bearer network per-trunk group basis.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**Summary of new or changed OMs/PMs for SN08**

| OM Group or PM name            | New or Changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRK2NET2                       | Changed        | Feature A00008350 (PT-IP, PT-AAL2) adds new register MIDFAIL4 as an extension register of MIDFAIL3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Product = CS 2000 - GWC</b> |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| GWC Performance Statistics     | New            | Feature A00007113 (PT-IP, PT-AAL2) adds the following performance measurements: <ul style="list-style-type: none"><li>• Small GWs in Disabled State</li><li>• Large GWs in Disabled State</li><li>• Trunk GWs in Disabled State</li><li>• Audio GWs in Disabled State</li><li>• Total Gateways Provisioned</li><li>• DNS failed GW discovery</li><li>• DNS good GW discovery</li><li>• RSIP used in GW discovery</li><li>• Total DNS GWs to discover</li><li>• USP SS7 paths disabled</li><li>• USP SS7 path not Active</li><li>• Peer connections failed during interval</li><li>• Peer connections completed during interval</li><li>• Peer connections attempted during interval</li></ul> |



**Summary of new or changed OMs/PMs for SN08**

| <b>OM Group or PM name</b>      | <b>New or Changed</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Media Proxy OMs                 | New                   | <p>Feature A00007327 (CHS) adds the following operational measurements:</p> <ul style="list-style-type: none"> <li>• Number of provisioned Media Proxies counts the number of currently provisioned media proxies on the GWC each 5-minute period.</li> <li>• Media Proxy 5 minute successful calls counts the number of calls that were successfully setup using this Media Proxy on this GWC in the last 5 minute OM period.</li> <li>• Media Proxy 30 minute successful calls counts the number of calls that were successfully setup using this Media Proxy on this GWC in the last 30 minute period.</li> <li>• Media Proxy 5 minute failed calls counts the number of failed attempts to setup a call using this Media Proxy on this GWC in the last 5 minute OM period.</li> <li>• Media Proxy 30 minute failed calls counts the number of failed attempts to setup a call using this Media Proxy on this GWC in the last 30 minute period.</li> <li>• GWC 5 minute successful calls counts the number of calls that were successfully setup using any available Media Proxy on this GWC in the last 5 minute OM period.</li> <li>• GWC 30 minute successful calls counts the number of calls that were successfully setup using any available Media Proxy on this GWC in the last 30 minute period.</li> <li>• GWC 5 minute failed calls counts the number of failed attempts to setup a call on any available Media Proxy on this GWC in the last 5 minute OM period.</li> <li>• GWC 30 minute failed calls counts the number of failed attempts to setup a call on any available Media Proxy on this GWC in the last 30 minute period.</li> </ul> |
| <b>Product = Integrated EMS</b> |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| IEMS supported OMs              |                       | Feature A00007302 (PT-IP, PT-AAL2) lists IEMS-supported OMs in its Appendix B.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Summary of new or changed OMs/PMs for SN08**

| <b>OM Group or PM name</b> | <b>New or Changed</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEMS OMs                   | New                   | Feature A00007344 (UA-IP) provides a table which lists the OMs that are collected by the IEMS. A separate MIB (IEMS OM MIB) will be defined for capturing all these OMs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Product = MG 9000</b>   |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Ethernet OM                | New                   | <p>Feature A00007000 (UA-IP) adds the following performance measurements for the Ethernet OM:</p> <ul style="list-style-type: none"> <li>• Number of Alignment Errors</li> <li>• Number of FCS Errors</li> <li>• Number of Internal MAC Receive Errors</li> <li>• Number of Frame Too Longs</li> <li>• Number of Internal MAC TX Errors</li> <li>• Number of Symbol Errors</li> <li>• Number of Inpause Frames</li> <li>• Number of Outpause Frames</li> <li>• Number of Drop Events</li> <li>• Number of Broadcast Packets</li> <li>• Number of Multicast Packets</li> <li>• Number of CRC Alignment Errors</li> <li>• Number of Undersize Packets</li> <li>• Number of Oversize Packets</li> <li>• Number of Fragments</li> <li>• Number of Jabbers</li> <li>• Number of Collisions</li> </ul> |

**Summary of new or changed OMs/PMs for SN08**

| <b>OM Group or PM name</b>     | <b>New or Changed</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MG9K EM performance statistics | Changed               | Feature A00007000 (UA-IP) adds the following new performance parameters: <ul style="list-style-type: none"><li>• Errored Seconds</li><li>• Severely Errored Seconds</li><li>• Unavailable Seconds</li><li>• Optical Power Transmit</li><li>• Optical Power Receive</li><li>• Transmit Bias Current</li><li>• Temperature</li><li>• Voltage</li></ul>                 |
| SMON Priority Statistics       | New                   | Feature A00007000 (UA-IP) adds the following performance measurements for the SMON Statistics: <ul style="list-style-type: none"><li>• Total number Packets</li><li>• Total Number of overflow Packets</li><li>• Total number of HC packets</li><li>• Total Number of Octets</li><li>• Total Number of overflow Octets</li><li>• Total number of HC octets</li></ul> |
| RMON HC Statistics             | New                   | Feature A00007000 (UA-IP) adds the following performance measurements for the RMON HC Statistics: <ul style="list-style-type: none"><li>• Number of HC overflow packets</li><li>• Number of packets received</li><li>• Number of overflow octets</li><li>• Number of octets of data received</li></ul>                                                               |

**Summary of new or changed OMs/PMs for SN08**

| <b>OM Group or PM name</b> | <b>New or Changed</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SMON Statistics            | New                   | <p>Feature A00007000 (UA-IP) adds the following performance measurements for the SMON Statistics:</p> <ul style="list-style-type: none"> <li>• VLAN ID</li> <li>• Total number Packets</li> <li>• Total Number of HC Packets</li> <li>• Create time</li> <li>• Total Number of Octets</li> <li>• Total Number of HC Octets</li> <li>• Total number of non unicast packets</li> <li>• Total number of non unicast HC octets</li> <li>• Total number of non unicast octets</li> <li>• Total number of non unicast overflow octets</li> </ul> |
| Configurable OM intervals  | Changed               | <p>Feature A00007107 (UA-IP) modifies OM collection as follows:</p> <ul style="list-style-type: none"> <li>• Timing intervals are now configurable from the element manager.</li> <li>• The MG9K now stores only 48 blocks of interval data for non-RFC-driven MIB tables.</li> <li>• A second, or extended, OM interval (a multiple of the standard interval) can be specified.</li> <li>• These new interval options apply only to OMs collected by the OM collector (see FN for list).</li> </ul>                                       |
| SMON Performance           | New                   | <p>Feature A00007271 (UA-IP) creates the following performance measurements:</p> <ul style="list-style-type: none"> <li>• smonVlanIdStatsTotalPkts - total incoming packets</li> <li>• smonVlanIdStatsTotalHCPkts - total outgoing packets</li> <li>• smonVlanIdStatsTotalOctets - total incoming octets</li> <li>• smonVlanIdStatsTotalHCOctets - total outgoing octets</li> </ul>                                                                                                                                                        |

**Summary of new or changed OMs/PMs for SN08**

| OM Group or PM name           | New or Changed | Description                                                                                                                            |
|-------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = CS 2000 TOPS</b> |                |                                                                                                                                        |
| TOPSALT<br>TOPSOC             | Changed        | Feature A00007271 (PT-IP) modifies TOPSALT by removing the ALTVL register and modifies TOPSOC by removing the OCMCCS register.         |
| (See Description column)      | Deleted        | Feature A00007271 (PT-IP) verifies that OM groups DUAQ and DUAQMOD were deleted in SN08, and that OM group TOPSPSZ is deleted in SN08. |

**AMA/Billing changes overview**

There is no AMA/Billing information that is new or changed for SN08.

**Summary of new or changed AMA/billing**

| AMA/billing item | New or Changed | Description |
|------------------|----------------|-------------|
|                  |                |             |

**Software Optionality Control (SOC) changes overview**

The following SOC information is new or changed for SN08. More complete descriptions appear in the Feature Deltas section of this document.

**Summary of new or changed SOC information for SN08**

| SOC code                 | New or Changed | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Product = CS 2000</b> |                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| SVBI0035                 | New            | Feature A00007383 (DMS) creates tracked SOC DNH Pilot Enhancement to track the DNH Pilot Number for CLI and Billing.                                                                                                                                                                                                                                                                                                                                                                              |
| MCD00002                 | New            | Feature A00007709 (DMS) creates this SOC to provide the presence-indication and call logging services for non-MCS (i.e., switch-based) subscribers. It does so by adding incremental AIN support for CONTINUE response to the AIN 0.1 Off Hook Delay (OHD) trigger query message. The SOC option MCD00002 is dependent on AIN Essentials software; order code AIN00006. It may only be enabled and used in conjunction with MCS Converged Desktop and is not supported for any other application. |

**Summary of new or changed SOC information for SN08**

| <b>SOC code</b> | <b>New or Changed</b> | <b>Description</b>                                                                                                                                                                                                                                                                            |
|-----------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NBD00005        | New                   | Feature A00007548 (IAC) creates this SOC to support PCES, and it has been added into the NBD SOC group. NBD00005 requires NBD00003 (USNBD) to have SOC state ON.                                                                                                                              |
| NTS00030        | New                   | Feature A00007934 (DMS, PT-AAL2) creates this SOC, "E800 Pretran Mapping." This SOC is always at ON state and does not control the feature functionality. This SOC has an RTU of A/P (Always Present) and the state cannot be changed to IDLE. SOC NTS00030 requires SOC NTS00005, "E800-US". |



# Integrated EMS Functionality

## Integrated EMS Northbound Interfaces

### General Information

The Integrated EMS provides a consolidated location to manage the Fault, Configuration, Performance Collection and Security account domains for devices (Network Elements, Element Managers, Management Applications and Platforms) in a CS 2000 central office. A brief description of its capabilities include the following:

- **Topology:** The Integrated EMS provides a graphical representation of the managed devices in a central office. The IEMS client comes with default views (Network Elements, Element Managers, Applications and Platforms) of the managed network and provides flexible interfaces that allow a craftsperson to create customized views of the network. The alarm state of each of the managed devices in the Integrated EMS topology is dynamically depicted by the associated background color (Red= Critical, Red=Major, Amber=Minor, Yellow=Warning, Green=Clear) of the managed device.
- **Fault:** The Integrated EMS aggregates the event streams received from the various EMSs, NEs, applications, and platforms that it manages. It normalizes the events received from these streams and forwards the events over its northbound interfaces (such as SCC2, NTSTD, SNMP, and SYSLOG). The Integrated EMS alarm and event browsers provide a consolidated real-time and historical view of the events that have occurred in a CS 2000 central office. It provides tools to view and page through the events and alarms in a common graphical interface. The Alarm and event browsers provide a wide range of features to manage, sort, filter and view events in a single centralized location. For detailed information on the IEMS fault management features please refer to the Integrated EMS Fault Management document (NN10334-911).
- **Performance:** The Integrated EMS provides a centralized location for collecting, storing and forwarding performance data in a CS 2000 central office. Its performance collection sub-system provides some basic tools for viewing and graphing the collected performance attributes. In addition, it

does provide interfaces to configure the generation of threshold alarms for the collected Operation Measurement data. For detailed information on the IEMS performance management features please refer to the Integrated EMS Performance Management document (NN10327-711).

- **Configuration:** The Integrated EMS provides a centralized location to launch the various Succession Configuration management interfaces. For detailed information on the IEMS performance management features please refer to the Integrated EMS Configuration Management document (NN10330-511).
- **Security:** The Integrated EMS provides a centralized graphical interface to configure and manage the user accounts in a Succession Central Office. The Integrated EMS Security subsystem provides centralized authentication and authorization server for many of its managed devices. It also provides centralized security logging for successful and failed authentications. In addition it provides Single Sign-on support enabling a user to log in to the IEMS client once and access multiple Succession Management interfaces without requiring the user to re-enter a userid and password. For detailed information on the IEMS Security management features please refer to the Integrated EMS Security and Administration document (NN10336-611).

## IEMS Northbound Fault Interface

### User Setup, Administration, and Customization of Views

For information on initial setup and customization of the Northbound fault feed from IEMS see:

- IEMS Fault Management Guide - NN10334-911

### Device Fault Mapping References for Northbound Interface

The following table shows the log identification criteria for each device, manager, and application supported by IEMS. Log references for table entries defined in *italics* can be found in:

NN10275-909 - Succession Fault Management Logs Reference (volumes 1-3)

See the table below for additional fault documentation

#### Fault Correlation for SN08 Devices

|   | NB format -><br>Device/EM                           | Documentation Log<br>Key | Document Reference                                |
|---|-----------------------------------------------------|--------------------------|---------------------------------------------------|
| 1 | <b><i>“Audio Provisioning<br/>Server (APS)”</i></b> | Specific Problem         | NN10328-911 MS 2000<br>Series Fault<br>Management |



|    | <b>NB format -&gt;<br/>Device/EM</b>           | <b>Documentation Log<br/>Key</b> | <b>Document Reference</b>                                                             |
|----|------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------|
| 2  | <b>“Call Agent Core”</b>                       | log name and log number          | see “Fault documentation for Call Agent Core:”                                        |
| 3  | <b>“Call Agent Platform”</b>                   | Log name and number              | NN10087-911 Call Agent Fault Management                                               |
| 4  | <b>CBM</b><br><b>See “CS2000 Core Manager”</b> | log name and number              | <b>See “CS2000 Core Manager”</b>                                                      |
| 5  | <b>CEM</b>                                     | log name and number              | NN10334-911- I Integrated EMS Fault Management                                        |
| 6  | <b>“Centrex IP Call Manager (CICM)”</b>        | log name and number              | NN10233-911 CICM Fault Management                                                     |
| 7  | <b>“CS2000 Core Manager”</b>                   | log name and number              | NN10082-911 CS 2000 Core Manager Fault Management                                     |
| 8  | <b>FPM</b>                                     |                                  |                                                                                       |
| 9  | <b>“Gateway Controller (GWC)”</b>              | Log name and number              | NN10090911 GWC Fault Management                                                       |
| 10 | <b>“GWC Manager”</b>                           | log name and number              | PLN-08AT OSS SN08 OSS Guide (ATM)<br><br>PLN-08IP OSS SN08 OSS Guide (IP)             |
| 11 | <b>“IEMS”</b>                                  | log name and number              | NN10275-909v3: Succession Fault Management Logs Reference Volume 3                    |
| 12 | <b>“Media Application Server (MAS)”</b>        | Event Id                         | NN10303-111 MCP 2.0 MAS Meetme Basics<br><br>NN10297-111 MCP 2.0 MAS Adhoc Basics     |
| 13 | <b>“Multimedia Communication Server (MCS)”</b> | log name and log number          | NN10247-111 Multimedia Communication Server 5200 System Management Console User Guide |

|    | <b>NB format -&gt;<br/>Device/EM</b>                                                             | <b>Documentation Log<br/>Key</b> | <b>Document Reference</b>                                                                    |
|----|--------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------------------------------|
| 14 | <b>“Multi-Service Data Manager (MDM)”</b>                                                        | log name and number              | NN10092-911 Passport 15000 and MDM in Succession Networks Fault Management (PT-AAL1/UA-AAL1) |
| 15 | <b>MDM for BSC<br/>see “Multi-Service Data Manager (MDM)”</b>                                    | log name and number              | see <b>“Multi-Service Data Manager (MDM)”</b>                                                |
| 16 | <b>MDM - carrier<br/>see “Multi-Service Data Manager (MDM)”</b>                                  | log name and number              | see <b>“Multi-Service Data Manager (MDM)”</b>                                                |
| 17 | <b>MDM Client-Server<br/>see “Multi-Service Data Manager (MDM)”</b>                              | log name and number              | see <b>“Multi-Service Data Manager (MDM)”</b>                                                |
| 18 | <b>“MultiService Switch 7400, 15000, 20000”</b>                                                  | log name and number              | NN10092-911 Passport 15000 and MDM in Succession Networks Fault Management (PT-AAL1/UA-AAL1) |
| 19 | <b><i>“Media Gateway 9000 (MG9000)”</i></b>                                                      | Logname and number               | NN10325-900 ATM/IP Fault Management                                                          |
| 20 | <b><i>“MG9000 Manager”</i></b>                                                                   | logname and number               | NN10074-911 MG9000 Fault Management                                                          |
| 21 | <b>“MS2000 Series Node”</b>                                                                      | logname and number               | NN10328-911 MS2000 Fault Management                                                          |
| 22 | <b><i>“Network Patch Manager (NPM)”</i></b>                                                      | logname and number               | N10084911 CS2000 Management Tools Fault Management                                           |
| 23 | <b>Ethernet Routing Switch, formerly “Ethernet Routing Switch 8600 (formerly Passport 8600)”</b> | logname and number               | 241-6003-110 Ethernet Routing Switch 8600 Device Integration Cartridge User Guide            |
| 24 | <b>“QoS Collector Application (QCA)”</b>                                                         | logname and number               | NN10083-911 Communication Server 2000 Fault Management                                       |

|    | <b>NB format -&gt;<br/>Device/EM</b>                                           | <b>Documentation Log<br/>Key</b>                                                                       | <b>Document Reference</b>                                                                                     |
|----|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 25 | <b><i>“SAM21 Element<br/>Manager”</i></b>                                      | logname and number                                                                                     | NN10089-911 SAM21<br>Shelf Controller Fault<br>Management                                                     |
| 26 | <b><i>“SAM21 Shelf<br/>Controller”</i></b>                                     | logname and number                                                                                     | NN10089-911 SAM21<br>Shelf Controller Fault<br>Management                                                     |
| 27 | <b><i>“SDM Platform”</i></b>                                                   | logname and number                                                                                     | NN10081-911 SDM Fault<br>Management                                                                           |
| 28 | <b><i>“Session Server<br/>Manager”</i></b>                                     | logname and number                                                                                     | NN10332-911 Session<br>Server Fault<br>Management                                                             |
| 29 | <b><i>“Succession Server<br/>Platform Foundation<br/>Software (SSPFS)”</i></b> | logname and number                                                                                     | NN10440-450<br>Upgrading a Carrier<br>VoIP Network                                                            |
| 30 | <b><i>“Storage Manager<br/>(STORM)”</i></b>                                    | logname and number                                                                                     | NN10088-911 Storm<br>Fault Management                                                                         |
| 31 | <b><i>“Universal Audio<br/>Server (UAS)”</i></b>                               | logname and number                                                                                     | NN10275-909 v3<br>Succession Fault<br>Management Logs<br>Reference<br><br>NN10073-911 UAS<br>Fault Management |
| 32 | <b><i>“Universal<br/>Signaling Point<br/>(USP)”</i></b>                        | Specific Problem: Log<br>Group=<text> & Log<br>Number=<number><br><br>Note: Log GroupID is<br>not used | NN10071911<br><br>USP Fault Management                                                                        |
| 33 | <b><i>“XACore”</i></b>                                                         | Logname and number                                                                                     | 297-8991-510 XA-Core<br>Maintenance Manual                                                                    |

## IEMS Northbound Fault Specifications

Fault events are available from any of four Northbound interfaces. Log formats supported in this release are: NTSTD, SCC2, Syslog, and SNMP. A description of each of these interfaces is given in the sections that follow.

OSS clients can receive faults in **SCC2** and **NTSTD** formats from IEMS by initiating a TCP socket connection to designated ports on the IEMS server. When a connection attempt is made by a remote host, the IEMS validates the connecting OSS as an authorized client. It then forwards all logs that satisfy

the configured filter criteria to the OSS. The port numbers and remote clients eligible to connect to these log streams are configured by the administrator.

**Note:** In legacy environments, the **ECORE** option was used to include the originating node name in the log header for SCC2 and NTSTD formats. This option is NOT supported with Nortel Networks Carrier VoIP solution. All references to **ECORE** in the following sections will assume this option is disabled.

Faults can be delivered to hosts via **SNMP** by configuring the IP address and port of the remote management application.

**Note 1:** By default, the following attribute values are used for configuring **SNMP** northbound fault feed. The administrator can change the above attribute values. Refer to the “Changing **SNMP** attributes for **SNMP** fault feeds” section to modify these values.

**Note 2:** • **SNMP port:** 8001

**Note 3:** • **read community:** public

**Note 4:** • **write community:** public

**Note 5:** • **SNMP version:** v2c

The standard **Syslog** interface can also be configured as a fault stream for remote management systems.

The following table summarizes the characteristics of the four Northbound fault feeds from IEMS.

**IEMS Northbound Fault Stream Characteristics**

| <b>Fault format</b> | <b>Port</b> | <b>OSS Connection</b>                              | <b>Stream type</b>          | <b>IEMS Config required</b> |
|---------------------|-------------|----------------------------------------------------|-----------------------------|-----------------------------|
| NTSTD               | 8555        | Incoming. IEMS waits for connection by remote host | ASCII stream over TCP, push | OSS IP address or hostname  |
| SCC2                | 8556        | Incoming. IEMS waits for connection by remote host | ASCII stream over TCP, push | OSS IP address or hostname  |

| Fault format | Port                                     | OSS Connection                                                                                                                                                                                                                                                                                                                                                             | Stream type                  | IEMS Config required                                                                                                                                                        |
|--------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SNMP         | user-defined on remote listener          | IEMS forwards SNMP faults as SNMP traps to OSS. OSS can also query IEMS for active alarm data. By default, the following attribute values are used for configuring SNMP northbound fault feed. The administrator can change the attribute values.<br><b>Default Settings:</b><br>SNMP port: 8001<br>read community: public<br>write community: public<br>SNMP version: v2c | SNMP trap events (UDP), push | IP address and port of listener on OSS                                                                                                                                      |
| Syslog       | designated port for Syslog service (514) | IEMS forwards log events to remote host                                                                                                                                                                                                                                                                                                                                    | ASCII data over UDP, push    | syslog.conf requires forwarding entry for log facility<br><br><b>Fault:</b><br>local7.notice<br><br><b>Audit:</b><br>local0.notice<br><br><b>Security:</b><br>local3.notice |

Each fault interface is discussed in the sections that follow.

## Northbound SCC2 Specification

SCC2 is an ASCII stream delivered to a Northbound receiving application. The stream is delivered over a TCP socket and is configured by the administrator.

This section provides a detailed description of the SCC2 log format delivered by IEMS.

### SCC2 Format Summary:

```
<Alarm Severity><Minute Indicator><Log Name><Log
Number><Threshold>< Sequence Number><Event Type><Event
Label><Equipment Identifier><Body Text>
```

### SCC2 Header Formats

SCC2 Header format:

-----

```

12345678901234567890123456789012345678901234567890123456789012
3456789
-----|-----|-----|-----|-----|-----|
-----
aabb\ccccdddeffff\gggg\h.../i.../j...
-----|-----|-----|-----|-----|-----|
-----

```

- 1 The backslash sign (\) signifies a space.
- 2 The forward slash sign (/) signifies a space that only appears if the preceding optional field exists.
- 3 The periods (...) signify variable length data.
- 4 The 'greater than' sign followed by periods (>...) signifies variable length indentation determined by the application.
- 5 The vertical lines do not appear on the actual report, they are used for presentation purposes in the above figure.
- 6 This notation only represents the header and does not include the application data area (i.e. the rest of the log report).

An example of a SCC2 log header is given below. It is also used in explaining the individual fields in the log header.

#### SCC2 Log Header Example:

```

* 03 PM 128+0417 TBL ISTB LIU7 348
      ISTb      From InSv

```

#### SCC2 Field Descriptions

| Fld | Name                    | Description                                                                                                                                                                                                               | Example |
|-----|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| a   | <b>Alarm Severity</b>   | The severity level of the log report. This is a 2 character field left justified and padded with blanks. Possible values are:<br>'*C' = critical alarm,<br>'***' = major alarm,<br>'* ' = minor alarm,<br>' ' = no alarm. | '*C'    |
| b   | <b>Minute Indicator</b> | This value represents the minutes after the hour. It consists of 2 numeric characters, right justified and padded with zeroes. It ranges from 00 to 59.                                                                   | '03'    |
| c   | <b>Log Name</b>         | This value can be 2 to 4 non blank characters. Within this fixed 4 characters, it is left justified and padded with blanks.                                                                                               | 'PM '   |

| Fld | Name                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Example   |
|-----|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| d   | <b>Log Number</b>           | This value is always 3 digits ranging from 000 to 999. It is right justified and padded with zeroes. For PROTOLOGs (i.e. TRAP, SWERR, INIT, INFO, and LOCK logs) it is a string of 3 spaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                         | '128'     |
| e   | <b>Threshold</b>            | Indicates whether a threshold was set for the given log report. A threshold can be temporarily set by using LOGUTIL. Thresholding will survive any restart by turning on the office parameter threshold_is_sampling in table OFCVAR and datafilling threshold value for individual log report in table LOGCLASS and RLOGCLAS on the CallServer. If THRESHOLD_IS_SAMPLING is on (Y), a log report is generated for every n-th instance of the log report generated. If threshold_is_sampling is off (N), every log report after the n-th report is generated.<br><br>Possible values are:<br>'+' = a threshold was set,<br>'' = no threshold was set. | '+'       |
| f   | <b>Sequence Number</b>      | This field defines the unique sequence for each log report. It is right justified and padded with zeroes. It represents 4 numeric characters ranging from 0000 to 9999.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | '0417'    |
| g   | <b>Event Type</b>           | Log report event type which is a string of 4 uppercase characters, left justified and padded with blanks. This field is defined by the applications that generate the log report.<br><br>Possible values include:<br><br>' ', 'CBSY', 'EXC ', 'FAIL', 'FLT ', 'INFO', 'INIT', 'LO ', 'MANB', 'OFFL', 'PASS', 'PBSY', 'RTS ', 'SUMM', 'SYSB', 'TBL ', 'TRAN', 'TRAP', 'UNEQ'.                                                                                                                                                                                                                                                                         | 'TBL '    |
| h   | <b>Event Label</b>          | A variable length character string that represents application event description. It is an optional field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 'ISTB'    |
|     |                             | <i>The following fields are defined by the applications that generate the log report. These fields are optional and independent of each other.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |
| i   | <b>Equipment Identifier</b> | A conditional equipment identifier determined by the application. It is a variable length character string.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 'LIU7348' |

| Fld | Name             | Description                                                                                                                                                                                                                      | Example                |
|-----|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| j   | <b>Body Text</b> | Application specific log body text starts here. This may contain several lines. Each new line is indented by eight spaces. Most log bodies start with a carriage return character so that none of it appears on the header line. | 'ISTb<br>From<br>InSv' |

### Examples of Logs with SCC2 Header

The sample logs below are shown for example only. They are syntactically correct but field contents may vary.

#### 1 Gateway Controller example

**\*\*14 GWC 307 7250 TBL GWC Fault**

Location: GWC-2-UNIT-0

NotificationID: 4

State: Raise

Category: Communications

Cause: Communications subsystem failure

Time: Jan 23 15:15:59 2004

Component Id: GWC=GWC-2-UNIT-0;Version=PGC92BA;Unit=unit\_0;Software=NODE MTC

Specific Problem: EM not responding, provisioned data loaded from local Flash

Description: Element Manager communication failure.

#### 2 Call Server example:

**56 LINE138 3778 INFO TRMT**

SLOA 21 1 02 01 DN 2145202111

TREATMENT SET = BUSY CALLED NO = 5202111

CALLID= 01BE 036D

### Northbound NTSTD

NTSTD is an ACSII stream delivered to a Northbound receiving application. The stream is delivered over a TCP socket and is configured by the administrator.

This section provides a detailed description of the NTSTD log format delivered by IEMS.

#### NTSTD Format Summary:



<Office Identifier><Alarm Severity><Threshold><Log Name><Log Number><Time MMMMDD hh:mm:ss>< Sequence Number><Event Type><Event Label><Equipment Identifier><Body Text>

## Standard Header Formats

ECORE Format OFF:

```
-----
-----
12345678901234567890123456789012345678901234567890123456789012
3456789
----- | ----- | ----- | ----- | ----- | ----- | --
-----
a...#cccdeeeefff\ggghh\ii:jj:kk\llll\nnnn\o.../p.../q...
----- | ----- | ----- | ----- | ----- | ----- | --
-----
```

### Notes:

- 1 The placeholder represented by the pound sign (#) is non-existent if both office parameter log\_office\_id and ecore\_format in table OFCVAR are turned off. The pound sign (#) represents a space in other cases (i.e. log\_office\_id is datafilled and ecore\_format is turned off; and whenever ecore\_format is turned on regardless of log\_office\_id).
- 2 The backslash sign (\) signifies a space.
- 3 The forward slash sign (/) signifies a space that only appears if the preceding optional field exists.
- 4 The periods (...) signify variable length data.
- 5 The vertical lines do not appear on the actual report, they are used for presentation purposes in the above figure.
- 6 This notation only represents the header and does not include the application data area (i.e. the rest of the log report).

An example of a standard log header is given below. It is also used in explaining the individual fields in the log header.

### Standard log header example:

```
SCP2B *+ PM128 OCT20 10:03:42 0417 TBL ISTB LIU7 348
          ISTb      From InSv
```

## NTSTD format field descriptions

| FId | Name                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Example |
|-----|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| a   | <b>Office Identifier</b> | Identifies the switch generating the Identifier log. This is an optional field. It is output if the office parameter log_office_id in table OFCVAR on the CallServer is datafilled. It has variable length from 0 up to 12 characters.                                                                                                                                                                                                                                                                                                                                                                                                                    | 'SCP2B' |
| b   | <b>Ecore Node Name</b>   | Originating node name where this log Node Name report is generated. It is an eight character field, its contents are left justified and padded with blanks. It is contained in the header if the office parameter ecore_format in table OFCVAR is turned on. <b>As of SN07, this option is not supported</b>                                                                                                                                                                                                                                                                                                                                              | 'CM'    |
| c   | <b>Alarm Severity</b>    | The severity level of the log report. This is a 3 character field right justified and padded with blanks. Possible values are:<br>'***' = critical alarm,<br>' **' = major alarm,<br>' *' = minor alarm,<br>' ' = no alarm.                                                                                                                                                                                                                                                                                                                                                                                                                               | ' *'    |
| d   | <b>Threshold</b>         | Indicates whether a threshold was set for the given log report. A threshold can be temporarily set by using LOGUTIL. Thresholding will survive any restart by turning on the office parameter threshold_is_sampling in table OFCVAR and datafilling threshold value for individual log report in table LOGCLASS and RLOGCLAS on the CallServer. If threshold_is_sampling is on (Y), a log report is generated for every n-th instance of the log report generated. If threshold_is_sampling is off (N), every log report after the n-th report is generated.<br><br>Possible values are:<br><br>'+' = a threshold was set,<br>' ' = no threshold was set. | '+'     |
| e   | <b>Log Name</b>          | This value can be 2 to 4 non blank characters. Within this fixed 4 characters, it is right justified and padded with blanks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ' PM'   |
| f   | <b>Log Number</b>        | This value is always 3 digits ranging from 000 to 999. It is right justified and padded with zeroes. For PROTOLOGs, (i.e. TRAP, SWERR, INIT, INFO and LOCK logs) it is a string of 3 spaces.                                                                                                                                                                                                                                                                                                                                                                                                                                                              | '128'   |

| <b>Fld</b> | <b>Name</b>                 | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                    | <b>Example</b>         |
|------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| g          | <b>Month Indicator</b>      | Consists of 3 uppercase characters ranging from 'JAN' to 'DEC' that represent the month.                                                                                                                                                                                                                                                                              | 'OCT'                  |
| h          | <b>Day Indicator</b>        | Consists of 2 numeric characters ranging from 01 to 31 that represent the day of the month                                                                                                                                                                                                                                                                            | '20'                   |
| i          | <b>Hour Indicator</b>       | Consists of 2 numeric characters ranging from 00 to 23 that represent the hour of the day.                                                                                                                                                                                                                                                                            | '10'                   |
| j          | <b>Minute Indicator</b>     | Consists of 2 numeric characters ranging from 00 to 59 that represent the minute of the hour.                                                                                                                                                                                                                                                                         | '03'                   |
| k          | <b>Second Indicator</b>     | Consists of 2 numeric characters ranging from 00 to 59 that represent the second of the minute.                                                                                                                                                                                                                                                                       | '42'                   |
| l          | <b>Sequence Number</b>      | This field defines the unique sequence for each log report. It is right justified and padded left with zeroes. Represents 4 numeric characters ranging from 0000 to 9999.                                                                                                                                                                                             | '0417'                 |
|            |                             |                                                                                                                                                                                                                                                                                                                                                                       |                        |
| n          | <b>Event Type</b>           | Log report event type which is a string of 4 uppercase characters, left justified and padded with blanks. This field is defined by the applications that generate the log report.<br><br>Possible values include: ' ', 'CBSY', 'EXC ', 'FAIL', 'FLT ', 'INFO', 'INIT', 'LO ', 'MANB', 'OFFL', 'PASS', 'PBSY', 'RTS ', 'SUMM', 'SYSB', 'TBL ', 'TRAN', 'TRAP', 'UNEQ'. | 'TBL'                  |
| o          | <b>Event Label</b>          | A variable length character string that represents application event description. This field is optional.                                                                                                                                                                                                                                                             | 'ISTB'                 |
|            |                             | <i>The following fields are defined by the applications that generate the log report. These fields are optional and independent of each other.</i>                                                                                                                                                                                                                    |                        |
| p          | <b>Equipment Identifier</b> | A conditional equipment identifier determined by the application. It is a variable length character string.                                                                                                                                                                                                                                                           | 'LIU<br>7<br>348'      |
| q          | <b>Body Text</b>            | Application specific log body text starts here. This may contain several lines. Each new line is indented by eight spaces. Most log bodies start with a carriage return character so that none of it appears on the header line.                                                                                                                                      | 'ISTb<br>From<br>InSv' |

## Examples of Logs with Standard Header

The sample logs below are shown for example only. They are syntactically correct but field contents may vary.

### 1 Gateway Controller example:

```
RTPU07BU  **  GWC307 Jan23 20:14:38 7250 TBL  GWC Fault
Location: GWC-2-UNIT-0
NotificationID: 4
State: Raise
Category: Communications
Cause: Communications subsystem failure
Time: Jan 23 15:15:59 2004
Component Id: GWC=GWC-2-UNIT-0;Version=PGC92BA;Unit=unit_0;Software=NODEMTC
Specific Problem: EM not responding, provisioned data loaded from local
Flash
Description: Element Manager communication failure.
```

### 2 Call Server example:

```
RTPU07BR      LINE138 Jan23 16:56:30 3778 INFO TRMT
SLOA 21 1 02 01      DN 2145202111
TREATMENT SET = BUSY   CALLED NO =          5202111
CALLID= 01BE 036D
```

## Northbound Syslog

Syslog is a standardized UDP protocol defined by the IETF working group:  
**Syslog Protocol (RFC 3164): <http://www.ietf.org/rfc/rfc3164.txt>**

This ACSII fault stream is delivered to a Northbound receiving Syslog host over the local 7 facility. On the IEMS server, Syslog routing is configured through the SSPFS command line interface. This interface manages any required changes to syslog.conf.

This section covers the vendor-specific information on the format and content of Syslog messages not covered under RFC3164.

The following shows a breakdown of the components of the MSG portion of a Syslog message provided by the IEMS Northbound interface:

```
<Time> <Host> IEMS:
_V2_~I=<NodeId>~H=<Host>~A=<ApplicationName>~S=<Seq.Number>
```

```
~~ <LogName><LogNumber> <AlarmSeverity> <EventType> <Label> ^M
<LogBody>
```

The following Syslog message will be used to discuss the structure of Syslog messages from IEMS:

```
Feb 23 12:38:54 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=4317~~
MGEM302 NONE TBL MG9K InvalidEMIPAddress^M Location: MG9k EM
Comm Network^M Notification Id: 17180020453^M State:
Cleared^M Category: communications^M Cause: Communications
Subsystem Failure^M Invalid EM IP Address - An invalid EM IP
address has been set on the GW^M Component Id: MG9k EM Comm
Network^M specificProblem: Invalid EM IP Address - An invalid
EM IP address has be^M en set on the GW^M Description:
An invalid EM IP address has been set on the GW
```

**Note:** See “MG9000 Manager” for comparison of this log in all IEMS Northbound formats.

### RFC3164 MSG Fields

Each Syslog message is prefixed by a timestamp and hostname. These fields are shown in *italics* in the example above. Section 4.1.2 of RFC3164 defines these fields as follows:

The **TIMESTAMP** field is the local time and is in the format of “Mmm dd

hh:mm:ss” (without the quote marks) where:

Mmm is the English language abbreviation for the month of the year with the first character in uppercase and the other two characters in lowercase. The following are the only acceptable values:

*Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec*

dd is the day of the month. If the day of the month is less than 10, then it **MUST** be represented as a space and then the number. For example, the 7th day of August would be represented as “Aug 7”, with two spaces between the “g” and the “7”.

hh:mm:ss is the local time. The hour (hh) is represented in a 24-hour format. Valid entries are between 00 and 23, inclusive. The minute (mm) and second (ss) entries are between

00 and 59 inclusive.

*A single space character MUST follow the TIMESTAMP field.*

The **HOSTNAME** field will contain only the hostname, the IPv4 address,

or the IPv6 address of the originator of the message. The preferred value is the hostname. If the hostname is used, the HOSTNAME field MUST contain the hostname of the device as specified in STD 13 [4].

It should be noted that this MUST NOT contain any embedded spaces.

The Domain Name MUST NOT be included in the HOSTNAME field. If the IPv4 address is used, it MUST be shown as the dotted decimal notation as used in STD 13 [5]. If an IPv6 address is used, any valid representation used in RFC 2373 [6] MAY be used.

*A single space character MUST also follow the HOSTNAME field.*

### IEMS Header

After the timestamp and hostnames fields, the following constants can be found in the next two fields - separated by a space:

**IEMS:** Indicates the start of fault-specific information

**\_V2\_** - Syslog format version

Immediately following this tag are several attributes specified as name-value pairs (NVPs). NVP tags are prefixed by a tilde '~' <tag>=<value> for easy identification by downstream parsers.

### NVPs for IEMS Syslog message

| Tag name | Description                                                                                                                                               | example                                                  |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| ~I       | Node Identifier                                                                                                                                           | ~I=                                                      |
| ~H       | Host name of                                                                                                                                              | ~H=znc0s0jh                                              |
| ~A       | Reporting Application name                                                                                                                                | ~A=IEMS                                                  |
| ~S       | Log Sequence number                                                                                                                                       | ~S=4317                                                  |
| ~~       | Indicates start of formatted log header from originator.<br><br>**Note: This indicator is NOT actually an NVP. It is followed by a single space character | ~~ MGEM302<br>NONE TBL<br>MG9K<br>InvalidEMI<br>PAddress |

**Parsing Conventions for Formatted Log Data:**

The format of the log header and body follow a number of conventions to facilitate parsing by downstream applications:

- 1 Line feeds in message text are identified by the ^M character sequence (this denotes a sequence of the two printable characters: caret and upper case M).
- 2 The log header start can be identified by the ~~ sequence followed by a space. The header is delimited by the line feed indicator (discussed in the previous bullet).
- 3 The log body is separated into lines using ^M sequences defined in bullet 1. Each line is prefixed with eight (8) space characters.
- 4 Line length (including leading spaces) will not exceed 80 characters. See example log above.
- 5 All text in the log header and body will consist of printable ACSII characters.
- 6 Blank lines are not allowed in the formatted log message. This includes both header and body components.

**Log Header**

The log header consists of the following fields. These fields map to the corresponding fields defined in both SCC2 and NTSTD.

A typical log header will appear in the following format ( ' ' indicates a space character):

```
~~\<logname>\<lognumber>\<AlarmSeverity>\<EventType>\<Label>^M<LogBody>
```

**Log Header fields in Syslog message**

| Name              | Description                                                                                                                                                                                  | Example |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| <b>Log Name</b>   | This value can be 2 to 4 non blank characters. Within this fixed 4 characters, it is right justified and padded with blanks.                                                                 | ' MGEM' |
| <b>Log Number</b> | This value is always 3 digits ranging from 000 to 999. It is right justified and padded with zeroes. For PROTOLOGs, (i.e. TRAP, SWERR, INIT, INFO and LOCK logs) it is a string of 3 spaces. | '302'   |

| Name                  | Description                                                                                                                                                                                                                                                                                                                                                           | Example                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alarm Severity</b> | This field defines the alarm severity and consists of one of the following text strings:<br><br>NONE, MINOR, MAJOR, CRIT                                                                                                                                                                                                                                              | 'NONE'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Event Type</b>     | Log report event type which is a string of 4 uppercase characters, left justified and padded with blanks. This field is defined by the applications that generate the log report.<br><br>Possible values include: ' ', 'CBSY', 'EXC ', 'FAIL', 'FLT ', 'INFO', 'INIT', 'LO ', 'MANB', 'OFFL', 'PASS', 'PBSY', 'RTS ', 'SUMM', 'SYSB', 'TBL ', 'TRAN', 'TRAP', 'UNEQ'. | 'TBL '                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Label</b>          | A variable length character string that represents application event description. This field is optional.                                                                                                                                                                                                                                                             | 'MG9K<br>InvalidEMIPAddress'                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Log Body</b>       | Application specific log body text starts here. This may contain several lines. Each new line is indented by eight spaces and delimited by the ^M (caret-M) character sequence.                                                                                                                                                                                       | '       Location: MG9k<br>EMCommNetwork^M<br>Notification Id:<br>17180020453^M<br>State: Cleared^M<br>Category:<br>communications^M<br>Cause:<br>Communications<br>SubsystemFailure^M<br>Invalid EM IP Address -<br>An invalid EM IP<br>address has been set<br>on the GW^M<br>Component Id: MG9k<br>EMCommNetwork^M<br>specificProblem:<br>Invalid EM IP Address -<br>An invalid EM IP<br>address has be^M<br>en set on the GW^M<br>Description: An invalid<br>EM IP address has<br>been set on the GW' |

### Notes on Log Body Text

The remainder of the message consists of the log body. The message text in this portion of the message is defined by the originating source. The presentation of this text is constrained only by the rules outlined in [“Parsing Conventions for Formatted Log Data:” on page 99](#).



**Note:** See Syslog Protocol (RFC 3164):  
<http://www.ietf.org/rfc/rfc3164.txt> for full details on this specification.

### Security and Audit logs

IEMS Security and Audit logs are managed through Syslog and can be forwarded to a remote Syslog host in the same way as fault events. Note that some Solaris applications forward security logs to authlog (/varlog/authlog). Sample content of each follow:

#### Audit log sample ( /var/log/auditlog ):

```
Jan 16 10:37:55 sspfs_svr ID[SUNWcluster.pmf.1020]: "CorbaNotification" requeued
Jan 16 10:38:06 sspfs_svr ID[SUNWcluster.pmf.1018]: "CorbaNotification" Failed to stay up.
Jan 16 10:38:06 sspfs_svr ID[SUNWcluster.pmf.1019]: "CorbaNotification" restarting too often ... sleeping 30 seconds.
Jan 16 10:38:36 sspfs_svr ID[SUNWcluster.pmf.1020]: "CorbaNotification" requeued
Jan 16 10:38:46 sspfs_svr ID[SUNWcluster.pmf.1018]: "CorbaNotification" Failed to stay up.
Jan 16 10:38:46 sspfs_svr ID[SUNWcluster.pmf.1019]: "CorbaNotification" restarting too often ... sleeping 30 seconds.
Jan 16 10:39:16 sspfs_svr ID[SUNWcluster.pmf.1020]: "CorbaNotification" requeued
Jan 16 10:41:42 sspfs_svr ID[SUNWcluster.pmf.1018]: "snmpp" Failed to stay up.
Jan 16 10:42:16 sspfs_svr ID[SUNWcluster.pmf.1018]: "ompush" Failed to stay up.
Jan 16 10:42:41 sspfs_svr ID[SUNWcluster.pmf.1018]: "CorbaNotification" Failed to stay up.
Jan 16 10:42:41 sspfs_svr ID[SUNWcluster.pmf.1020]: "CorbaNotification" requeued
Jan 16 10:42:49 sspfs_svr ID[SUNWcluster.pmf.1018]: "PropServer" Failed to stay up.
```

#### Security log sample ( /var/log/securitylog ):

```
Feb  6 22:03:16 wnc0s0qh IEMS: IEMS class_security.ver01 STAT=SUCCESS SRC.USR=root
EVNT.TYPE =Authentication
Feb  6 22:03:16 wnc0s0qh last message repeated 1 time
Feb  9 14:34:33 wnc0s0qh IEMS: IEMS class_security.ver01 STAT=SUCCESS SRC.USR=root
EVNT.TYPE =Authentication
Feb  9 14:34:33 wnc0s0qh last message repeated 1 time
Feb  9 15:36:20 wnc0s0qh IEMS: IEMS class_security.ver01 STAT=SUCCESS SRC.USR=root
EVNT.TYPE =Authentication
Feb  9 15:36:20 wnc0s0qh last message repeated 1 time
```

```
Feb 11 10:15:53 wnc0s0qh IEMS: IEMS class_security.ver01 STAT=SUCCESS SRC.USR=root
EVNT.TYPE =Authentication
Feb 11 10:15:53 wnc0s0qh last message repeated 1 time
```

### Security log sample ( /var/log/securitylog ):

```
Dec 15 06:48:37 comp5iems su: 'su oracle' succeeded for root on /dev/???
Dec 15 06:48:56 comp5iems sshd[12755]: Accepted publickey for root from 192.168.47.2 port 64329
ssh2
Dec 15 08:42:36 comp5iems su[1200]: 'su root' failed for maint on /dev/pts/4
Dec 15 08:42:53 comp5iems su[2685]: 'su root' succeeded for maint on /dev/pts/4
```

The following table shows a summary of all Syslog facilities used by IEMS.

**Note:** Only *Fault*, *Audit*, and *Security* streams are supported for use by downstream systems. Shaded entries are intended for support purposes only.

### IEMS Northbound Syslog Facilities

| Log Stream   | Log file location on IEMS Server                           | Syslog facility |
|--------------|------------------------------------------------------------|-----------------|
| Fault        | /var/log/iemsCustomerlog                                   | local7          |
| Audit        | /var/log/auditlog                                          | local0          |
| Security     | /var/log/securitylog<br>/var/log/authlog/, auth (facility) | local3          |
| Customer log | /var/log/customerlog                                       | local1          |
| Debug        | /var/log/debuglog                                          | local2          |
| SSPFS        | /var/log/sspfslog                                          | local4          |
| NPM          | /var/log/npm_designlog                                     | local5          |

### Northbound SNMP - IETF MIB specification

IEMS provides an SNMP interface that forwards faults in trap messages and responds to SNMP requests.

The SNMP Northbound interface is based on the IETF RFC 3877 standard which includes features such as alarm synchronization not available with NTSTD or SCC2.

This section provides a high-level description of how to support the IETF Alarm MIB draft defined in the DISMAN working group of the IETF. See the

MIBs on the server in the locations specified in the table below. In this document, IEMS is the agent implementing the MIBs for the manager at the OSS level.

### MIB Loading Sequence

The MIB loading sequence for a manager application is as follows:

These MIBs are available on the IEMS server in the locations noted in the following table.

#### MIB Loading Sequence

| Load Order | MIB Name            | IEMS Server File location                                     |
|------------|---------------------|---------------------------------------------------------------|
| 1          | SNMPv2-CONF         | (Not required by the IEMS server)                             |
| 2          | SNMPv2-SMI          | /opt/nortel/iems/current/mibs                                 |
| 3          | SNMPv2-TC           | /opt/nortel/iems/current/mibs                                 |
| 4          | SNMPv2-MIB          | /opt/nortel/iems/current/mibs<br>SNMPv2-MIB.txt               |
| 5          | SNMP-FRAMEWORK-MIB  | /opt/net-snmp/share/snmp/mibs/<br>SNMP-FRAMEWORK-MIB.txt      |
| 6          | INET-ADDRESS-MIB    | /opt/net-snmp/share/snmp/mibs/<br>INET-ADDRESS-MIB.txt        |
| 7          | RFC1212             | (Not required by the IEMS server)                             |
| 8          | RFC1155-SMI         | /opt/nortel/iems/current/mibs                                 |
| 9          | RFC1213-MIB         | /opt/nortel/iems/current/mibs<br>RFC1213-MIB.txt              |
| 10         | RMON-MIB            | /opt/nortel/iems/current/mibs/cicm<br>RMON-MIB.txt            |
| 11         | TOKEN-RING-RMON-MIB | /opt/nortel/iems/current/mibs/cicm<br>TOKEN-RING-RMON-MIB.txt |
| 12         | RMON2-MIB           | /opt/nortel/iems/current/mibs/cicm<br>RMON2-MIB.txt           |
| 13         | ALARM-MIB           | /opt/nortel/iems/current/mibs/usp/<br>ALARM-MIB-disman-18.txt |

| <b>Load Order</b> | <b>MIB Name</b>            | <b>IEMS Server File location</b>                                       |
|-------------------|----------------------------|------------------------------------------------------------------------|
| <b>14</b>         | IANA-ITU-ALARM-TC          | /opt/nortel/iems/current/mibs/usp/<br>IANA-ITU-ALARM-TC-disman-18.txt  |
| <b>15</b>         | ITU-ALARM-TC               | /opt/nortel/iems/current/mibs/usp/<br>ITU-ALARM-TC-disman-18.txt       |
| <b>16</b>         | ITU-ALARM-MIB              | /opt/nortel/iems/current/mibs/usp/<br>ITU-ALARM-MIB-disman-18.txt      |
| <b>17</b>         | ITU-IANA-ALARM-TC          | /opt/nortel/iems/current/mibs/usp/<br>ITU-IANA-ALARM-TC-disman-04.txt  |
| <b>18</b>         | NOTIFICATION-LOG-MIB       | /opt/nortel/iems/current/mibs/usp/<br>NOTIFICATION-LOG-MIB-rfc3014.txt |
| <b>19</b>         | NORTEL-MIB                 | /opt/nortel/iems/current/mibs/usp/nortel.mib                           |
| <b>20</b>         | NORTEL-GENERIC-MIB         | /opt/nortel/iems/current/mibs/usp/<br>nortelGenericMIBs-smi2.mib       |
| <b>21</b>         | ENTITY-MIB                 | /opt/nortel/iems/current/mibs/usp/<br>ENTITY-MIB-entmib-03.txt         |
| <b>22</b>         | ENTITY-STATE-MIB           | /opt/nortel/iems/current/mibs/usp/<br>ENTITY-STATE-MIB-entmib-01.txt   |
| <b>23</b>         | NORTEL-ALARM-EXT-MIB       | /opt/nortel/iems/current/mibs/usp/<br>nortel_alarm_ext_smi.txt         |
| <b>24</b>         | NORTEL-NMI-MIB             | /opt/nortel/iems/current/mibs/usp/<br>nortelNMI-smi2.smi               |
| <b>25</b>         | NORTEL-NMI-ALARM-CLEAR-MIB | /opt/nortel/iems/current/mibs/usp/<br>nortelNMIalarmClear_smi.txt      |

Support for the IETF Alarm MIB is new to IETF. The MIBs defined by the DISMAN working group of IETF are designed to allow surveillance of network elements. We have used this set of MIBs to present the state of our

softswitch. The ALARM MIB presents a set of tables that contain the current alarm information for the device. The alarm MIB does not prescribe the notifications used to set and clear alarms on the device.

Nortel has provided an extension MIB to allow a manager to monitor the system alarm changes through SNMP notifications. These notifications are the primary interface for monitoring faults in the Succession node.

### Nortel Alarm Extension MIB

This MIB defines notifications used for alarm asserts and clears in addition to data type definitions and tables related to notifications that can be sent.

A complete listing and description of our fault management MIB may be found in “IEMS Appendix 2: Nortel Alarm Extension MIB”.

### TABLE SUPPORT IN NORTEL ALARM EXTENSION MIB

The table `nnExtAlarmActiveTable` along with the `AlarmActiveTable` contains all the information required to resynchronize the northbound SNMP agent and to give the OSS a complete view of the active alarms within the scope of the Integrated EMS.

The `nnExtAlarmStateTable` is not supported at this time.

### NOTIFICATION SUPPORT IN NORTEL ALARM EXTENSION MIB

All notifications defined in this MIB are supported. All OIDs defined within the notifications are also populated. The alarm notifications include sequence numbers so the SNMP manager can determine if a message is missed. Specific formats are supported as described in the following table.

#### Alarm Notifications Varbinds

| Variable name                                      | Format                           | OID                           |
|----------------------------------------------------|----------------------------------|-------------------------------|
| <code>alarmActiveResourceId</code>                 | OID                              | .1.3.6.1.2.1.118.1.2.2.1.10   |
| <code>alarmActiveDateAndTime</code>                | DateandTime                      | .1.3.6.1.2.1.118.1.2.2.1.2    |
| <code>alarmActiveDescription</code>                | Human readable string            | 1.3.6.1.2.1.118.1.2.2.1.11    |
| <code>nnExtAlarmActiveEventType</code>             | Enum                             | .1.3.6.1.4.1.562.29.6.1.1.1.1 |
| <code>nnExtAlarmActiveProbableCause</code>         | Enum                             | .1.3.6.1.4.1.562.29.6.1.1.1.2 |
| <code>nnExtAlarmActiveAdditionalText</code>        | String                           | .1.3.6.1.4.1.562.29.6.1.1.1.3 |
| <code>nnExtAlarmActiveDocumentation Pointer</code> | String: up to 4 chars + 3 digits | .1.3.6.1.4.1.562.29.6.1.1.1.4 |

| Variable name                       | Format                                                                                                                             | OID                           |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| nnExtAlarmActiveResourceDescription | compType=compname;<br>subcompType=subcompName;<br>..... for as many levels of hierarchy is required to identify the alarmed entity | .1.3.6.1.4.1.562.29.6.1.1.1.5 |
| nnExtAlarmActiveManualClear         | enum                                                                                                                               | .1.3.6.1.4.1.562.29.6.1.1.1.6 |
| nnExtAlarmActiveSequenceNumber      | Numeric                                                                                                                            | .1.3.6.1.4.1.562.29.6.1.1.1.7 |

These varbinds are included in all 5 of the alarm notifications supported by the Integrated EMS. As defined all notifications in SNMP, *sysUpTime* and the OID of the notification are included in the varbinds for all notification types (see the following table). Each of the notifications signifies a different severity of the specified alarm. Notifications are defined for critical, major, minor, warning and cleared alarms. The notifications are defined in the table below.

#### Trap OIDs and Alarm Severity

| Trap OID                      | Severity           |
|-------------------------------|--------------------|
| .1.3.6.1.4.1.562.29.6.1.0.306 | nnExtAlarmMessage  |
| .1.3.6.1.4.1.562.29.6.1.0.305 | nnExtAlarmCritical |
| .1.3.6.1.4.1.562.29.6.1.0.304 | nnExtAlarmMajor    |
| .1.3.6.1.4.1.562.29.6.1.0.303 | nnExtAlarmMinor    |
| .1.3.6.1.4.1.562.29.6.1.0.302 | nnExtAlarmWarning  |
| .1.3.6.1.4.1.562.29.6.1.0.301 | nnExtAlarmClear    |

The nnExtAlarmMessage notifications can be used to send informational messages from IEMS. Because these notifications are information, reliability is not addressed. As illustrated in the table below, we populate with information in the message header and bodytext of our NTSTD and CUSTLOG feeds.

#### Message Notification Varbinds

| Variable name             | Format | OID                           |
|---------------------------|--------|-------------------------------|
| nnExtAlarmMessageResource | OID    | .1.3.6.1.4.1.562.29.6.1.3.1.1 |

| Variable name                         | Format      | OID                           |
|---------------------------------------|-------------|-------------------------------|
| nnExtAlarmMessageResourceDescription  | String      | .1.3.6.1.4.1.562.29.6.1.3.1.2 |
| nnExtAlarmMessageDateAndTime          | DateAndTime | .1.3.6.1.4.1.562.29.6.1.3.1.3 |
| nnExtAlarmMessageDocumentationPointer | String      | .1.3.6.1.4.1.562.29.6.1.3.1.4 |
| nnExtAlarmMessageInfo                 | String      | .1.3.6.1.4.1.562.29.6.1.3.1.5 |
| nnExtAlarmMessageResource             | OID         | .1.3.6.1.4.1.562.29.6.1.3.1.1 |

### OTHER DEFINITIONS IN THIS MIB

This MIB also defines OSI state variables that are not defined in the IETF Entity State MIB. These variables and tables are not supported at this time.

### IETF RFC 3877 MIB Tables

There are several tables introduced by the IETF Alarm MIB Model. This document will discuss each table and intended use.

#### ALARM MODEL TABLE

This table defines the notifications used by IEMS to express alarm events. Notifications to communicate alarm asserts and clears have been defined by NortelNetworks in a separate MIB. These new notifications are defined in “Nortel Alarm Extension MIB” on page 105.

This table is not currently supported. This table is a static table and we will look to support this in some future release. This table provides model documentation to OSSes.

#### ALARM ACTIVE TABLE

This table contains a list of active alarms on IEMS and is supported. It, along with 2 other tables - the alarm active variable table and the Nortel Alarm Extension Table - provide a complete view of the active alarms within the scope of the Integrated EMS.

Indexes into this table are: *alarmListName*, *alarmActiveDateAndTime*, *alarmActiveIndex*. *alarmListName* matches the index *nlmLogName* for *nlmLogTable* from RFC3014 (Notification Log MIB). For our Succession IEMS table we use the string “NorCarrFault”.

The following table describes expected values for entries in this table.

**IETF Alarm Active Entry**

| Sequence Field               | Default Value                                                                        |
|------------------------------|--------------------------------------------------------------------------------------|
| alarmListName                | Nortel_fault                                                                         |
| alarmActiveDateAndTime       | none                                                                                 |
| alarmActiveIndex             | Numerical index defined by agent, unique in table                                    |
| alarmActiveEngineID          | IEMS agent engine ID in SNMPv3; empty string in SNMPv2                               |
| alarmActiveEngineAddressType | Inet address type (IPv4)                                                             |
| alarmActiveEngineAddress     | IPv4 address of active IEMS agent                                                    |
| alarmActiveContextName       | ""                                                                                   |
| alarmActiveVariables         | 12 = number of fields in our alarm set notifications + 2 mandatory entries per alarm |
| alarmActiveNotificationID    | OID of notification sent for this alarm set                                          |
| alarmActiveResourceID        | OID that describes this entry in the Active Alarm Table                              |
| alarmActiveDescription       | none                                                                                 |
| alarmActiveLogPointer        | not implemented - default = 0.0                                                      |
| alarmActiveModelPointer      | not implemented - default = 0.0                                                      |
| alarmActiveSpecificPointer   | not implemented - default = 0.0                                                      |

**ALARM ACTIVE VARIABLE TABLE**

Alarm Active variable table contains the varbinds for all the active alarm notifications. The indexes to the table are: *alarmListName*, *alarmActiveIndex*, *alarmVariableIndex*. For each alarm in the alarm active table there will be 12 entries in the alarm active variable table. The index *alarmVariableIndex* will be from 1 to 12 (also from 1 to *alarmActiveVariables* in the *alarmActiveTableEntry*). The notifications contain some varbinds that are not in the standard table so the OSS can index into this table to get the additional data. (Similarly, the OSS can index into the Nortel Extension Active Alarm Table for the additional information as well.)

Fields in this table for each alarm are as follows:

**Alarm Active Variable Table**

| Alarm Active Variable Entry | Notification Varbind | Default Value |
|-----------------------------|----------------------|---------------|
| alarmActiveVariableIndex 1  | sysUpTime            | sysUpTime     |



| Alarm Active Variable Entry | Notification Varbind                 | Default Value                                           |
|-----------------------------|--------------------------------------|---------------------------------------------------------|
| alarmActiveVariableIndex 2  | snmpTrapOID                          | snmpTrapOID                                             |
| alarmActiveVariableIndex 3  | alarmActiveResourceId                | OID that describes this entry in the Active Alarm Table |
| alarmActiveVariableIndex 4  | alarmActiveDescription               | none                                                    |
| alarmActiveVariableIndex 5  | alarmActiveDateAndTime               | none                                                    |
| alarmActiveVariableIndex 6  | nnExtAlarmActiveEventType            | none                                                    |
| alarmActiveVariableIndex 7  | nnExtAlarmActiveProbableCause        | none                                                    |
| alarmActiveVariableIndex 8  | nnExtAlarmActiveAdditionalText       | none                                                    |
| alarmActiveVariableIndex 9  | nnExtAlarmActiveDocumentationPointer | This is often logname & number                          |
| alarmActiveVariableIndex 10 | nnExtAlarmActiveResourceDescription  | none                                                    |
| alarmActiveVariableIndex 11 | nnExtAlarmActiveManualClear          | none                                                    |
| alarmActiveVariableIndex 12 | nnExtAlarmActiveSequenceNumber       | none                                                    |

### ALARM CLEAR TABLE

This table provides an interface for SNMP managers to clear alarms on devices which support this operation. Manual clears are performed with SNMP SET operations using the alarmActiveIndex of the alarm to be cleared. See section “Manual Clear” on page 119 for details.

### ACTIVE ALARM STATS TABLE

Not supported.

### ITU ALARM ACTIVE TABLE

Not supported.

### ITU ALARM ACTIVE VARIABLE TABLE

Not supported.

### ITU ALARM ACTIVE STATS TABLE

Supported.

## NLM LOG TABLE (RFC 3014)

NLM Log Table is defined in IETF RFC 3014. Implementation of the MIB is provided to support incremental resynchronization of the OSS. The OSS SNMP managers can reach into the *nlmLogTable* to get missed events. See [Notification Log MIB \(RFC 3014\)](http://www.ietf.org/rfc/rfc3014.txt?number=3014):  
<http://www.ietf.org/rfc/rfc3014.txt?number=3014>.

The Notification Log MIB has 3 different MIB groups:

- configuration parameters dealing with log storage and reporting
- statistics of log reporting
- the actual history of notifications

### Configuration

Configuration defines the size and the aging criteria of the *nlmLogTable*. Table *nlmConfigLogTable* also defines the named log entries supported in the *nlmLogTable*. We use a specific named log entry for allowing fault resync. This table also defines filtering of these logs.

Each entry in the config log table contains: *nlmLogName*, *nlmConfigLogFilterName*, *nlmConfigLogEntryLimit*, *nlmConfigLogAdminStatus*. This table enables Alarm notification resynchronization. The first and only entry in this table has an *nlmLogName* that matches the *alarmListName* index for the active alarm tables above. This index is "Nortel\_fault."

*nlmConfigLogFilterName* is defined as "default". We do not support the correlation of this value to any specific data in the *snmpNotifyFilterTable* in the SNMP Notification MIB.

*nlmConfigLogEntryLimit* defines the size of the log table. This defines the number of alarm events that are available to the SNMP manager through the SNMP agent. Since there is only one entry in this table for Nortel\_fault, this value is over-ridden by *nlmConfigGlobalEntryLimit*.

**Note:** It is recommended that *nlmConfigGlobalEntryLimit* be set to a minimum value as it maintains this history in memory. Do **not** set this value to zero. Setting this value to zero will lead to unlimited entries being saved and lead to potential resource issues in the system.

*nlmConfigLogAdminStatus* is set to enabled (1).

*nlmConfigLogOperStatus* is set to noFilter (3).

*nlmConfigLogStorageType* is a storageType OID. Data associated with this entry is considered volatile and will be lost when the agent is restarted.

SNMP sets for the configuration items in this table are not supported.

### Statistics

The statistics group contains two scalars and a table. The table is required for the resync algorithm. The table *nlmStatsLogTable* augments the *nlmConfigLogTable* and has only two values in each entry: *nlmStatsLogNotificationsLogged* and *nlmStatsLogNotificationsBumped*. Because this table augments the *nlmConfigLogTable*, the index for these notifications uses the same key - "Nortel\_fault"

*nlmStatsLogNotifications* for the named logs in Nortel\_fault is the sequence number (*nnExtAlarmActiveSequenceNumber*) sent in Integrated EMS notifications of the faults. This also provides the secondary index into the *nlmLogTable* for notifications that have been missed - as detected through sequence numbers in those notifications.

It is the responsibility of the SNMP agent sending fault notifications to increment the *nlmStatsLogNotificationsLogged* and include the value in the varbinds of that notification as documented.

*nlmStatsGlobalNotificationsBumped* defines the number of logs that have been removed or "bumped" from the log table due to the limits imposed by the *nlmConfigGlobalEntryLimit* setting.

### Log Table

The *nlmLogTable* contains the history of notifications sent to the manager. The indices are: *nlmLogName* and *nlmLogIndex*. *nlmLogName* is "Nortel\_fault" and the *nlmLogIndex* is the sequence number in the proprietary notifications.

This section defines two tables: *nlmLogTable* and *nlmLogVariableTable*. The first provides the indices for retrieving missed notifications, and the second contains the varbinds for the notifications. We have 2 different size alarm notifications (in terms of number of varbinds)- alarm assert notifications are all the same size, and alarm clear notifications are slightly smaller (1 varbind). Only alarm notifications are stored in the log table, message notifications are not logged in this table.

The structure and implementation of the *nlmLogVariableTable* is the same as that of the *alarmActiveVariableTable* and is not described further.

### Connecting to the NB feed:

The default SNMP Port in which the agent is listening is 8001. This port is configurable through the IEMS client. User can also disable the SNMP agent if he wishes. OSS has to register its SNMP manager host and port to which the traps are to be sent.

### Connection Reliability

There are several scenarios which must be considered by an SNMP manager to ensure that the alarms presented at the OSS layer will be in sync with the actual alarms maintained on the device. Resynchronization will be required when either the OSS or the IEMS system goes through a restart, or when a lost trap is detected. See section “ Message Sequences and Manager Operations” on page 117 for details on resynchronization of active alarms.

### Lost Traps

If the OSS detects a lost trap via an out-of-order sequence number, the OSS must either try to recover the lost sequence numbers from the notification log table or re-synchronize from the active alarm table. The notification log MIB will contain the last 25 traps sent. If the sequence number delta is within this range, the notification log table can be used to obtain missed traps. Otherwise, a read of the active alarm table must be used to determine the active alarms in the system.

Additionally, OSS can poll the sequence number of the last alarm or clear sent from the agent. The sequence number of last notification sent will be in the *nlmStatsLogNotifications* table in the *nlmStatsLogNotificationsLogged* variable in the “Nortel\_fault” entry as described above.

**Note:** Since there is only one entry in this table, the scalar *nlmStatsGlobalNotificationsLogged* can also be used to obtain this value.

### SNMP Alarm Events & Correlation

The *alarmActiveResourceID* uniquely identifies an alarm occurrence in the system. To correlate a clear notification to the appropriate assert, the *alarmActiveResourceID* must be used.

### Event Types and Probable Causes

Each alarm notification and record in the alarm table includes event type and probable cause. Values for these fields are defined in the IANA-ITU-ALARM-TC MIB table. These values come from both the X.7xx and M.3100 series of standards.

#### Alarm Event Type Format:

IANAItuEventType - Valid values for this entry are provided here for convenience.

- other (1),
- communicationsAlarm (2),
- qualityOfServiceAlarm (3),
- processingErrorAlarm (4),
- equipmentAlarm (5),

environmentalAlarm (6),  
integrityViolation (7),  
operationalViolation (8),  
physicalViolation (9),  
securityServiceOrMechanismViolation (10),  
timeDomainViolation (11)

**Probable Cause Format:**

IANAItuProbableCause - Valid values for this entry are provided here for convenience.

aIS (1), callSetUpFailure (2), degradedSignal (3),  
farEndReceiverFailure (4), framingError (5), lossOfFrame (6),  
lossOfPointer (7), lossOfSignal (8), payloadTypeMismatch (9),  
transmissionError (10), remoteAlarmInterface (11), excessiveBER  
(12), pathTraceMismatch (13), unavailable (14), signalLabelMismatch  
(15), lossOfMultiFrame (16), receiveFailure (17), transmitFailure (18),  
modulationFailure (19), demodulationFailure (20),  
broadcastChannelFailure (21), connectionEstablishmentError (22),  
invalidMessageReceived (23), localNodeTransmissionError (24),  
remoteNodeTransmissionError (25), routingFailure (26),  
backplaneFailure (51), dataSetProblem (52),  
equipmentIdentifierDuplication (53), externalIFDeviceProblem (54),  
lineCardProblem (55), multiplexerProblem (56),  
nEIdentifierDuplication (57), powerProblem (58), processorProblem  
(59), protectionPathFailure (60), receiverFailure (61),  
replaceableUnitMissing (62), replaceableUnitTypeMismatch (63),  
synchronizationSourceMismatch (64), terminalProblem (65),  
timingProblem (66), transmitterFailure (67), trunkCardProblem (68),  
replaceableUnitProblem (69), realTimeClockFailure (70),  
antennaFailure (71), batteryChargingFailure (72), diskFailure (73),  
frequencyHoppingFailure (74), iODeviceError (75),  
lossOfSynchronisation (76), lossOfRedundancy (77),  
powerSupplyFailure (78), signalQualityEvaluationFailure (79),  
tranceiverFailure (80), protectionMechanismFailure (81),  
protectingResourceFailure (82), airCompressorFailure (101),  
airConditioningFailure (102), airDryerFailure (103),  
batteryDischarging (104), batteryFailure (105),  
commercialPowerFailure (106), coolingFanFailure (107),  
engineFailure (108), fireDetectorFailure (109), fuseFailure (110),  
generatorFailure (111), lowBatteryThreshold (112), pumpFailure  
(113), rectifierFailure (114), rectifierHighVoltage (115),  
rectifierLowFVvoltage (116), ventilationsSystemFailure (117),  
enclosureDoorOpen (118), explosiveGas (119), fire (120), flood (121),  
highHumidity (122), highTemperature (123), highWind (124),

iceBuildUp (125), intrusionDetection (126), lowFuel (127), lowHumidity (128), lowCablePressure (129), lowTemperature (130), lowWater (131), smoke (132), toxicGas (133), coolingSystemFailure (134), externalEquipmentFailure (135), externalPointFailure (136), storageCapacityProblem (151), memoryMismatch (152), corruptData (153), outOfCPUCycles (154), sfwrEnvironmentProblem (155), sfwrDownloadFailure (156), lossOfRealTime (157), applicationSubsystemFailure (158), configurationOrCustomisationError (159), databaseInconsistency (160), fileError (161), outOfMemory (162), softwareError (163), timeoutExpired (164), underlyingResourceUnavailable (165), versionMismatch (166), adapterError (500), applicationSubsystemFailure (501), bandwidthReducedX733 (502), callEstablishmentError (503), communicationsProtocolError (504), communicationsSubsystemFailure (505), configurationOrCustomizationError (506), congestionX733 (507), corruptData (508), cpuCyclesLimitExceeded (509), dataSetOrModemError (510), degradedSignalX733 (511), dteDceInterfaceError (512), enclosureDoorOpenX733 (513), equipmentMalfunction (514), excessiveVibration (515), fileErrorX733 (516), fireDetected (517), framingErrorX733 (518), heatingVentCoolingSystemProblem (519), humidityUnacceptable (520), inputOutputDeviceError (521), inputDeviceError (522), lanError (523), leakDetected (524), localNodeTransmissionErrorX733 (525), lossOfFrameX733 (526), lossOfSignalX733 (527), materialSupplyExhausted (528), multiplexerProblemX733 (529), outOfMemoryX733 (530), outputDeviceError (531), performanceDegraded (532), powerProblems (533), pressureUnacceptable (534), processorProblems (535), pumpFailureX733 (536), queueSizeExceeded (537), receiveFailureX733 (538), receiverFailureX733 (539), remoteNodeTransmissionErrorX733 (540), resourceAtOrNearingCapacity (541), responseTimeExcessive (542), retransmissionRateExcessive (543), softwareErrorX733 (544), softwareProgramAbnormallyTerminated (545), softwareProgramError (546), storageCapacityProblemX733 (547), temperatureUnacceptable (548), thresholdCrossed (549), timingProblemX733 (550), toxicLeakDetected (551), transmitFailureX733 (552), transmitterFailure (553), underlyingResourceUnavailable (554), versionMismatchX733 (555), -  
- The following are defined in X.736 authenticationFailure (600), breachOfConfidentiality (601), cableTamper (602), delayedInformation (603), denialOfService (604), duplicateInformation (605), informationMissing (606), informationModificationDetected (607), informationOutOfSequence (608), keyExpired (609), nonRepudiationFailure (610), outOfHoursActivity (611), outOfService (612), proceduralError (613),

unauthorizedAccessAttempt (614), unexpectedInformation (615), other (1024).

## Northbound Fault Mapping

The following table shows the correlation between the fields of the supported Northbound fault feeds.

**Northbound Fault Format Summary**

| Row# | IEMS Schema                                                                                 | SYSLOG                                                                          | NTSTD                                                              | SCC2                                                            | SNMP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | Severity<br>1= critical<br>2 = major<br>3 = minor<br>4= warning<br>5 =clear<br><br>6 = info | Alarm Severity<br>CRIT =1,<br>MAJOR =2,<br>MINOR =3,<br>NONE =4,5,6<br><br>None | 1 = '****'<br>2 = '*** '<br>3 = '* '<br>4,5,6 = ' '<br><br>6 = ' ' | 1 = '*C'<br>2 = '***'<br>3 = '* '<br>4,5,6 = ' '<br><br>6 = ' ' | Based on the severity the concerned alarm, appropriate notification will be sent.<br><br>nnExtNotificationPrefix:<br>.1.3.6.1.4.1.562.29.6.1.0<br><br><b>Alarm Events:</b><br>nnExtAlarmCritical = 1<br>.1.3.6.1.4.1.562.29.6.1.0.305<br>nnExtAlarmMajor = 2<br>.1.3.6.1.4.1.562.29.6.1.0.304<br>nnExtAlarmMinor = 3<br>.1.3.6.1.4.1.562.29.6.1.0.303<br>nnExtAlarmWarning = 4<br>.1.3.6.1.4.1.562.29.6.1.0.302<br>nnExtAlarmClear = 5<br>.1.3.6.1.4.1.562.29.6.1.0.301<br><br><b>Non-alarm Events:</b><br>nnExtAlarmMessage = 6<br>.1.3.6.1.4.1.562.29.6.1.0.306 |
| 2.   | Time (long)                                                                                 | MMM DD<br>hh:mm:ss -><br>UTC time                                               | MMM DD<br>hh:mm:ss UTC<br>time                                     | UTC -> Minute Indicator                                         | <b>Alarm event:</b><br>alarmActiveDateAndTime<br>.1.3.6.1.2.1.118.1.2.2.1.2<br><br><b>Non-alarm event:</b><br>nnExtAlarmMessageDateAndTime<br>.1.3.6.1.4.1.562.29.6.1.3.1.3                                                                                                                                                                                                                                                                                                                                                                                       |

## Northbound Fault Format Summary

| Row# | IEMS Schema     | SYSLOG                    | NTSTD                               | SCC2                                | SNMP                                                                                                                                                                                                                                          |
|------|-----------------|---------------------------|-------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.   | LogName         | Report Name               | LogName                             | LogName                             | Log name&number shown in varbind<br><br><b>Alarm event:</b><br>nnExtAlarmActiveDocumentationPointer<br>.1.3.6.1.4.1.562.29.6.1.1.1.4<br><br><b>Non-alarm event:</b><br>nnExtAlarmMessageDocumentationPointer<br>.1.3.6.1.4.1.562.29.6.1.3.1.4 |
| 4.   | LogNumber       | ReportNumber              | LogNumber                           | LogNumber                           | Log name&number shown in varbind<br><br><b>Alarm event:</b><br>nnExtAlarmActiveDocumentationPointer<br>.1.3.6.1.4.1.562.29.6.1.1.1.4<br><br><b>Non-alarm event:</b><br>nnExtAlarmMessageDocumentationPointer<br>.1.3.6.1.4.1.562.29.6.1.3.1.4 |
| 5.   | Threshold       | -                         | Threshold<br>'+' set<br>' ' not set | Threshold<br>'+' set<br>' ' not set | not supported                                                                                                                                                                                                                                 |
| 6.   | ID (Integer)    | NotificationID            | NotificationID                      | NotificationID                      | last integer in the OID specified by:<br>alarmActiveResourceID<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.25.50.48.48.52.45.49.45.56.44.51.58.50.49.58.53.55.46.49.44.43.48.53.58.51.48.10                                           |
| 7.   | Sequence Number | Generated Sequence Number | Global Sequence Number (generated)  | Global Sequence Number (generated)  | <b>Alarm event:</b><br>nnExtAlarmActiveSequenceNumber<br>.1.3.6.1.4.1.562.29.6.1.1.1.7                                                                                                                                                        |
| 8.   | EventType       | EventType                 | EventType                           | EventType                           | <b>Alarm event:</b><br>not supported                                                                                                                                                                                                          |
| 9.   | EventLabel      | EventLabel                | EventLabel                          | EventLabel                          | not supported                                                                                                                                                                                                                                 |



### Northbound Fault Format Summary

| Row# | IEMS Schema          | SYSLOG           | NTSTD            | SCC2             | SNMP                                                                                                                                                                                                |
|------|----------------------|------------------|------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.  | Equipment Identifier | Location:        | Location:        | Location:        | <b>Alarm event:</b><br>nnExtAlarmActiveResourceDescription<br>.1.3.6.1.4.1.562.29.6.1.1.1.5<br><br><b>Non-alarm event:</b><br>nnExtAlarmMessageResourceDescription<br>.1.3.6.1.4.1.562.29.6.1.3.1.2 |
| 11.  | Probable Cause       | Cause            | Cause            | Cause            | <b>Alarm event:</b><br>nnExtAlarmActiveProbableCause<br>.1.3.6.1.4.1.562.29.6.1.1.1.2                                                                                                               |
| 12.  | Category             | Category:        | Category:        | Category:        | <b>Alarm event:</b><br>nnExtAlarmActiveEventType<br>.1.3.6.1.4.1.562.29.6.1.1.1.1                                                                                                                   |
| 13.  | Specific Problem     | Specific Problem | Specific Problem | Specific Problem | <b>Alarm event:</b><br>alarmActiveDescription:<br>.1.3.6.1.2.1.118.1.2.2.1.11                                                                                                                       |
| 14.  | NotificationID       | not sent         | not sent         | non sent         | not sent                                                                                                                                                                                            |
| 15.  | ComponentID          | ComponentID      | ComponentID      | ComponentID      | <b>Alarm event:</b><br>nnExtAlarmActiveResourceDescription<br>.1.3.6.1.4.1.562.29.6.1.1.1.5<br><br><b>Non-alarm event:</b><br>nnExtAlarmMessageResourceDescription<br>.1.3.6.1.4.1.562.29.6.1.3.1.2 |
| 16.  | BodyText             | BodyText         | BodyText         | BodyText         | <b>Alarm event:</b><br>alarmActiveDescription:<br>.1.3.6.1.2.1.111.1.2.2.1.11<br><br><b>Non-alarm event:</b><br>nnExtAlarmMessageInfo:<br>.1.3.6.1.4.1.562.29.6.1.3.1.5                             |

## Message Sequences and Manager Operations

### Raise Alarm

This sequence applies to the following alarm event types:

- nnAlarmWarning
- nnAlarmMinor

- nnAlarmMajor
  - nnAlarmCritical
- 1 IEMS forwards alarm from device. The trap contains references to the 12 varbinds depicted in Table , “Alarm Active Variable Table,” on page 108.
  - 2 The OSS receives the alarm and notes the resource ID of the alarm event to allow correlation with a subsequent alarmClear event. IEMS adds the alarm entry to the *alarmActiveTable*, *alarmActiveVariableTable*, and *nnExtAlarmActiveTable*. The *nlmLogTable* and *nlmLogVariableTable* also maintain a rolling log of the last n alarm events received - where n is defined by the variable *nlmConfigGlobalEntryLimit*.

### Clear Alarm

- 1 IEMS forwards clearAlarm event from device. The trap contains references to all varbinds listed in Please refer to “ Alarm Active Variable Table” on page 108. except for *nnExtAlarmActiveManualClear* - which is not included in this message.
- 2 The OSS receives the clear event and matches its resource ID in **alarmActiveResourceId** against the ID of its corresponding alarm event in the *alarmActiveTable*.

The corresponding alarm entry is removed from all active alarm tables:

*alarmActiveTable*

*alarmActiveVariableTable*

*nnExtAlarmActiveTable*

An entry is made in the log notification tables for the CLEAR event.

*nlmLogTable*

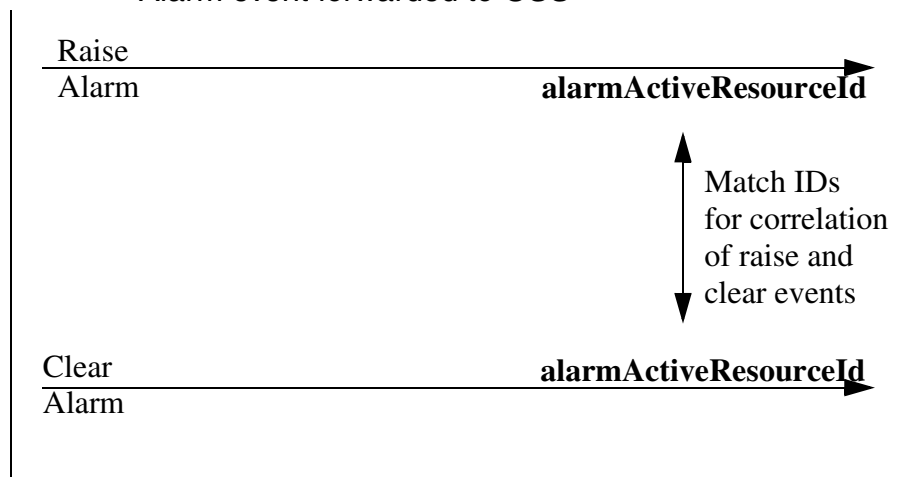
*nlmLogVariableTable*

## Alarm Raise &amp; Clear Correlation

IEMS

OSS

Alarm event forwarded to OSS



## Manual Clear

Each alarm event contains information that indicates whether it can be manually cleared. The value in the varbind *nnExtAlarmActiveManualClear* makes this determination and can have the following values:

- other (1),
- forbidden (2),
- required (3),
- optional (4)

**Note:** Alarms with a value of *forbidden* in this field cannot be manually cleared.

Eligible alarms can be manually cleared by sending a SET request to the alarm clear interface variable *nortelNMIALarmClear* (.1.3.6.1.4.1.562.29.1.8.1) in the NORTEL\_NMI-ALARM-CLEAR-MIB. The alarm to be cleared can be specified by using the *alarmActiveIndex* of the target alarm. The value of the *alarmActiveIndex* is stored as the last element in the *alarmActiveResourceId*.

**Example:** An alarm is generated and stored in the *alarmActiveTable* with the following values:

*alarmsListName*: **Nortel\_fault**

*alarmActiveDateAndTime*: 2004-1-8,3:21:57.1,+05:30

*alarmActiveIndex*: **10**

The resulting *alarmActiveResourceId* will be:

*alarmActiveResourceId*.12.78.111.114.116.101.108.95.102.97.117.108.1  
 16.25.50.48.48.52.45.49.45.56.44.51.58.50.49.58.53.55.46.49.44.43.48.5  
 3.58.51.48.10

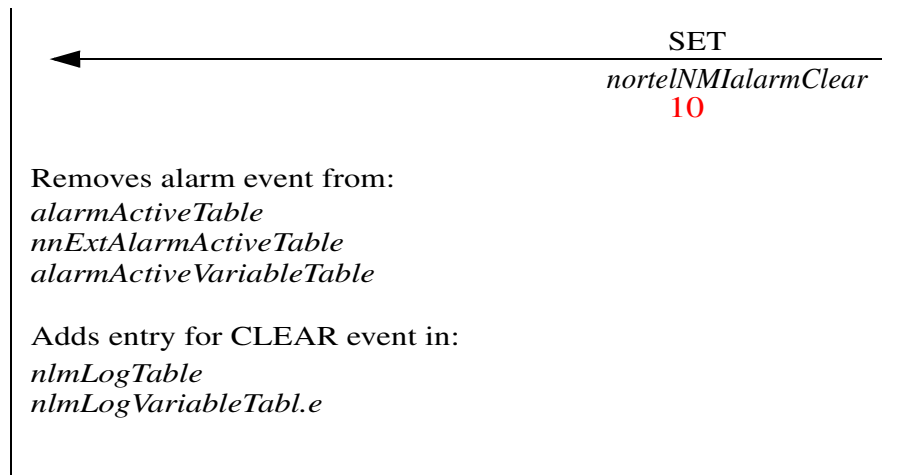
**Note:** *alarmActiveResourceId* is shown fully encoded.

The SET request will be sent with a value of 10. The corresponding alarm entry is removed from the *alarmActiveTable*, *alarmActiveVariableTable*, and *nnExtAlarmActiveTable*. A corresponding entry for the manual clear is then made in *nlmLogTable* and *nlmLogVariableTable*. See the following figure.

#### Manual Clear of Alarm Event

IEMS

OSS



#### Detecting System Restarts

Before an alarm event is forwarded to a downstream manager, the IEMS assigns the current system up-time of the server to the alarm contents. As discussed previously, it can be found in the *sysUpTime* varbind of the alarm. On restart of the IEMS server, this value is initialized to 0 to signal downstream systems of the event. The OSS can use *sysUptime* to monitor system restarts as follows:

#### Correlation with sequence numbers

Since *sysUpTime* will always increase with each sequential alarm event, restart conditions can be detected if the following condition is met:

$(sysUpTime \text{ of current event}) < (sysUpTime \text{ of previous event})$

### Restart Recovery

When the OSS determines that IEMS has been restarted, it must perform a full reload of the active alarms in the system to synchronize its data with the agent. See [“Full Resync of Active Alarms” on page 121](#) for details.

### Detection of Missing Logs

Each alarm event generated by IEMS contains a unique sequence number that can be used to detect lost notifications. Once an OSS identifies a missing sequence number, it can be re-queried from the IEMS server if the following condition is met:

(sequence# of latest event) - (sequence# of missing event)

$\leq nlmConfigGlobalEntryLimit$  (default = 25)

If this condition is met, then the missing log can be recovered. See “Incremental Resync of missing logs”.

Otherwise, a full resynchronization of the alarm tables will be required. See [“Full Resync of Active Alarms” on page 121](#).

### Full Resync of Active Alarms

There are two scenarios for which an SNMP manager will be required to perform a complete reload of the active alarms from IEMS:

- on startup of the management application
- when missing alarm notifications are sufficiently old to have been rotated out of the *nlmLogTable*. This table maintains a snapshot of the most recent 25 alarm events. If the missing sequence number cannot be found in this table, then a reload of all active alarms is required.

Active alarm data resides in:

*alarmActiveTable*

*nnExtAlarmActiveTable*

A full table read must be performed on the varbinds in Please refer to “Required Varbinds for Active Alarm resync” on page 121. to perform the resync:

#### Required Varbinds for Active Alarm resync

| Varbind                | OID                         |
|------------------------|-----------------------------|
| snmpTrapOID            | .1.3.6.1.6.3.1.1.4.1        |
| alarmActiveResourceId  | .1.3.6.1.2.1.118.1.2.2.1.10 |
| alarmActiveDateAndTime | .1.3.6.1.2.1.118.1.2.2.1.2  |
| alarmActiveDescription | .1.3.6.1.2.1.118.1.2.2.1.11 |

| Varbind                              | OID                           |
|--------------------------------------|-------------------------------|
| nnExtAlarmActiveEventType            | .1.3.6.1.4.1.562.29.6.1.1.1.1 |
| nnExtAlarmActiveProbableCause        | .1.3.6.1.4.1.562.29.6.1.1.1.2 |
| nnExtAlarmActiveAdditionalText       | .1.3.6.1.4.1.562.29.6.1.1.1.3 |
| nnExtAlarmActiveDocumentationPointer | .1.3.6.1.4.1.562.29.6.1.1.1.4 |
| nnExtAlarmActiveResourceDescription  | .1.3.6.1.4.1.562.29.6.1.1.1.5 |
| nnExtAlarmActiveManualClear          | .1.3.6.1.4.1.562.29.6.1.1.1.6 |
| nnExtAlarmActiveSequenceNumber       | .1.3.6.1.4.1.562.29.6.1.1.1.7 |

**Note:** These varbinds are retrieved from the *alarmActiveVariableTable*

The manager can perform a full resync with the *alarmActiveTable* in a similar way to that used when performing an incremental resync from the *nlmLogVariableTable* (see “Incremental Resync of missing logs”). As stated earlier, each alarm entry in the *alarmActive* table has a corresponding entry for all of the alarm components in the *alarmActiveVariable* table. The complete set of alarm data can be retrieved for each alarm by first retrieving the *alarmActiveIndex* of the entry in the *alarmActiveTable*, and then using this index to request its corresponding entries from the *alarmActiveVariableTable*. These steps can be summarized as follows:

- 1 Poll the IEMS server for the latest sequence number. Issue a GET request on *nlmStatsLogNotificationsLogged*. Perform steps 2 to 3 until all alarms have been retrieved from IEMS.
- 2 Derive the list of indices to the *alarmActive* table by performing a series of GETNEXT requests on any one of its columns. The *alarmActiveIndex* for entries can be parsed from this data.
- 3 For each *alarmActiveIndex* derived in step 2, determine the alarm type perform a GET request on the *alarmActiveVariableTable* all index fields for the alarm type. The specific index fields requested will be based on the alarm type specified by the *snmpTrapOID* in index 2. See “Incremental Resync of missing logs” for a description of varbinds used in the different event types. This step essentially performs repeated incremental resync operations until complete.
- 4 Based on the alarm type determined in step 3, request all varbinds (GET) in the *alarmActiveVariableTable* for the constructed index

*alarmListName* = Nortel\_fault

*alarmActiveIndex* = (derived in step 2)

*alarmActiveVariableIndex* (1-n) - depends on alarm type found in step 3

**Note:** The *alarmActiveVariableTable* and *nlmLogVariableTable* contain the same indexed alarm information and are accessed in similar ways. The main difference between the two is that *alarmActiveVariableTable* uses the *alarmActiveIndex* as one of its key components, whereas the *nlmLogVariableTable* uses the sequence number.

### Incremental Resync of missing logs

An OSS can monitor sequence numbers from alarm events to detect missing notifications. If a missing notification is found (as described in “Detection of Missing Logs”), then it can be queried from the *nlmLogVariableTable* using the sequence number.

- 1 OSS detects missing sequence number
- 2 Missing alarm events can be recovered from the *nlmLogVariableTable* using the sequence number. Depending on the alarm event type, different numbers of varbinds will be present in the table for the entry.

The following table shows an example of the varbinds that would be used to recover a missing RAISE event with a sequence number of “1390”. RAISE events include the following alarm types:

*nnExtAlarmWarning* (.1.3.6.1.4.1.562.29.6.1.0.302)

*nnExtAlarmMinor* (.1.3.6.1.4.1.562.29.6.1.0.303)

*nnExtAlarmMajor* (.1.3.6.1.4.1.562.29.6.1.0.304)

*nnExtAlarmCritical* (.1.3.6.1.4.1.562.29.6.1.0.305)

Table , “nlmLogVariableTable varbinds for recovery of lost CLEAR notification,” on page 125 shows an example of the varbinds that would be used to recover a missing CLEAR event with a sequence number of “1390”. CLEAR events are specified by the following OID:

*nnExtAlarmClear* (.1.3.6.1.4.1.562.29.6.1.0.301)

The alarm type can be determined by examining the value of the *snmpTrapOID* of the missed alarm. For both alarm types, this value is assigned index 2 of the *nlmLogVariable* table and can be queried with the OIDs shown in the following table. The alarm type will determine the mapping for the remaining fields in the notification message.

**nImLogVariableTable** varbinds for recovery of lost RAISE notification

| <b>nImLogVariableTable<br/>Index Variable</b> | <b>OID<br/>(nImLogName =<br/>"Nortel_fault" (encoded)<br/>Sequence# = 1390<br/>Index = 1 - 12)</b> | <b>Notification Varbind Represented</b> |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|
| nImLogVariableIndex 1                         | nImLogVariableTimeTicksVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.1          | sysUpTime                               |
| nImLogVariableIndex 2                         | nImLogVariableOidVal.12.7<br>8.111.114.116.101.108.95.1<br>02.97.117.108.116.1390.2                | snmpTrapOID                             |
| nImLogVariableIndex 3                         | nImLogVariableOctetStringVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.3        | alarmActiveResourceId                   |
| nImLogVariableIndex 4                         | nImLogVariableOctetStringVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.4        | alarmActiveDescription                  |
| nImLogVariableIndex 5                         | nImLogVariableOctetStringVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.5        | alarmActiveDateAndTime                  |
| nImLogVariableIndex 6                         | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108<br>.95.102.97.117.108.116.139<br>0.6      | ituAlarmEventType                       |
| nImLogVariableIndex 7                         | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108<br>.95.102.97.117.108.116.139<br>0.7      | ituAlarmProbableCause                   |
| nImLogVariableIndex 8                         | nImLogVariableOctetStringVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.8        | ituAlarmAdditionalText                  |
| nImLogVariableIndex 9                         | nImLogVariableOctetStringVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.9        | nnItuAlarmActiveDocumentationPointer    |
| nImLogVariableIndex 10                        | nImLogVariableOctetStringVal.12.78.111.114.116.101.1<br>08.95.102.97.117.108.116.1<br>390.10       | nnItuAlarmActiveResourceDescription     |



**nImLogVariableTable** varbinds for recovery of lost RAISE notification

| <b>nImLogVariableTable<br/>Index Variable</b> | <b>OID<br/>(nImLogName =<br/>"Nortel_fault" (encoded)<br/>Sequence# = 1390<br/>Index = 1 - 12)</b>    | <b>Notification Varbind Represented</b>                                              |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| nImLogVariableIndex 11                        | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108<br>.95.102.97.117.108.116.139<br><b>0.11</b> | nnItuAlarmActiveManualClear<br>( <b>not</b> present in CLEAR events, see next table) |
| nImLogVariableIndex 12                        | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108<br>.95.102.97.117.108.116.139<br><b>0.12</b> | nnItuAlarmActiveSequenceNumber                                                       |

**nImLogVariableTable** varbinds for recovery of lost CLEAR notification

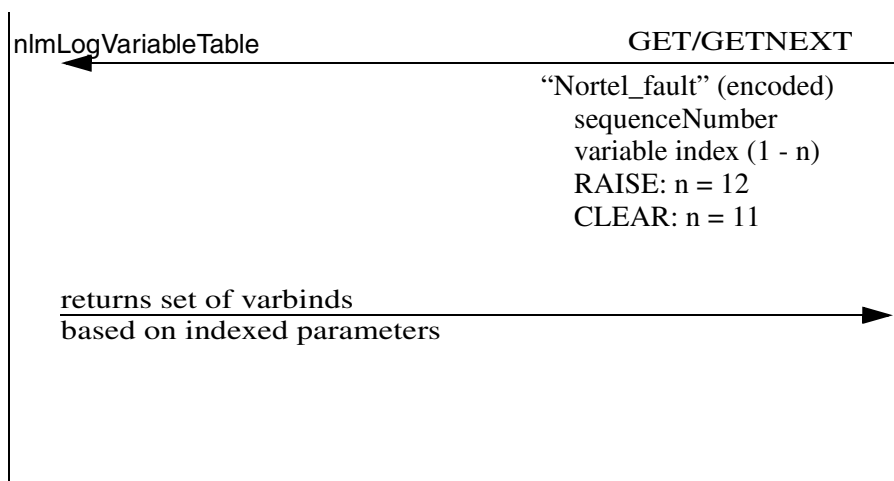
| <b>nImLogVariableTable<br/>Index Variable</b> | <b>OID<br/>(nImLogName =<br/>"Nortel_fault" (encoded)<br/>Sequence# = 1390<br/>Index = 1 - 11)</b> | <b>Notification Varbind Represented</b> |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|
| nImLogVariableIndex 1                         | nImLogVariableTimeTicksVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390. <b>1</b>      | sysUpTime                               |
| nImLogVariableIndex 2                         | nImLogVariableOidVal. <b>12.78.111.114.116.101.108.95.102.97.117.108.116.1390.2</b>                | snmpTrapOID                             |
| nImLogVariableIndex 3                         | nImLogVariableOctetStringVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390. <b>3</b>    | alarmActiveResourceId                   |
| nImLogVariableIndex 4                         | nImLogVariableOctetStringVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390. <b>4</b>    | alarmActiveDescription                  |
| nImLogVariableIndex 5                         | nImLogVariableOctetStringVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390. <b>5</b>    | alarmActiveDateAndTime                  |
| nImLogVariableIndex 6                         | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390. <b>6</b>      | ituAlarmEventType                       |

| <b>nImLogVariableTable<br/>Index Variable</b> | <b>OID<br/>(nImLogName =<br/>"Nortel_fault" (encoded)<br/>Sequence# = 1390<br/>Index = 1 - 11)</b> | <b>Notification Varbind Represented</b> |
|-----------------------------------------------|----------------------------------------------------------------------------------------------------|-----------------------------------------|
| nImLogVariableIndex 7                         | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108<br>.95.102.97.117.108.116.139<br>0.7      | ituAlarmProbableCause                   |
| nImLogVariableIndex 8                         | nImLogVariableOctetStringVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390.8            | ituAlarmAdditionalText                  |
| nImLogVariableIndex 9                         | nImLogVariableOctetStringVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390.9            | nnItuAlarmActiveDocumentationPointer    |
| nImLogVariableIndex 10                        | nImLogVariableOctetStringVal<br>.12.78.111.114.116.101.108.95.102.97.117.108.116.1390.10           | nnItuAlarmActiveResourceDescription     |
| nImLogVariableIndex 11                        | nImLogVariableInteger32Val<br>.12.78.111.114.116.101.108<br>.95.102.97.117.108.116.139<br>0.11     | nnItuAlarmActiveSequenceNumber          |

### Recovery of missing alarm by sequence number

**IEMS**

**OSS**



## Northbound Performance Interface

### IEMS Performance Interface Specification

The Northbound performance interface provides the customer a single reporting interface for the managed network. This has been achieved through the definition of a “Common Performance Record format” (CPR-F). The common format maps operational statistics from across network elements to a common set of metrics to provide a network-level view of performance.

The Common Performance Record format specification is defined using a standardized XML interface. It provides a full definition of the normalized containment hierarchy describing performance statistics for reporting network components. PM collection jobs configured in IEMS can report device metrics in either XML or CSV formats.

The following is a list of devices that support collection of performance data in the SN08 release, PP8600, STORM, MS2000, Session Server-Trunks (platform PMs only), MAS, MCS, MCS Mgr, FPM, MG15000, SAM21, IEMS, UAS, GWC, USP, MG9K, and SSPFS.

### XML

If XML is selected as the output format, then the data is collected and saved as an ACSII file in the format defined by the CPR-F XML Schema Document. The format specification below provides a full description of the normalized representation of PM data for supported network elements.

### Conversion to CSV

When CSV output is configured in the collection job, data is initially transformed to the XML format described above. An additional step then converts the XML file to its corresponding CSV representation. There is no loss of information during this process. Net content represented by each output is identical.

The next section defines the CPR-F in terms of its XML structure followed by a discussion of its *conversion* to CSV format.

Also, collected CSV and XML performance files can be transferred from IEMS to an OSS system by configuring a transfer job for the performance files. The transfer can be done using FTP or SFTP.

For more information on configuring, retrieving, and transferring performance measurements through IEMS, see NN10327-711 - IEMS Performance Management Guide.

## The Common Performance Record Format

### Overview

The Common Performance record is an XML document specified using an XML Schema Document (XSD).

There are two major aspects to encoding performance measurements – identifying the source of the measurements within the network and recording the measurement data itself.

The CPR-F uses an XML containment structure to indicate the source point in the network of the performance measurements. A typical performance measurement may have originated in an NE and then been passed up to an element management system (EMS). The EMS in turn may have passed the measurements along to an Operations Support System (OSS).

For this particular case, the common record would contain an XML element representing the management system (the OSS) which ultimately received the set of performance measurements. Within this OSS element would be an element representing the EMS which forwarded the measurements to the OSS.

And within this EMS element, there would be an XML element representing the NE (network element) from which the PMs were obtained. The NE element may itself contain another XML element representing the sub-component in the NE which generated the measurement.

The measurement data itself would also be encoded in one or more XML elements. These data elements would be contained within the sub-component element above.

### XML Elements

The common performance record format uses thirteen major elements to encode performance information:

The *PMFile* element is the top-level element and contains all other elements.

The *System* element, *Entity* element and *SubEntity* element are used to relate the measurements to some origination point in the network and to capture their path through the management systems.

The *SingleValues* & *SingleValue* elements, the *GroupOfValues* & *GroupValue* elements and the *Table*, *Labels*, *Label*, *RowOfValues* & *RowValue* elements may all be used to capture the performance measurement information itself.

### Encoding Source Identification for Performance Measurements

A performance measurement (PM) originates in some device in the network which records the measured value. This measurement may be combined with

other measurements within the device and forwarded to a management system. The management system may combine the PMs from many devices into a single grouping and may forward this grouping of PMs to some superior management system. Again this superior management system may combine groupings of measurements from many domains in the network and forward the combined package of measurements to yet another management system.

This path that PMs take as they move from the network device level to the management level is encoded in the CPR. Three elements are used to indicate this path:

*System* element

*Entity* element

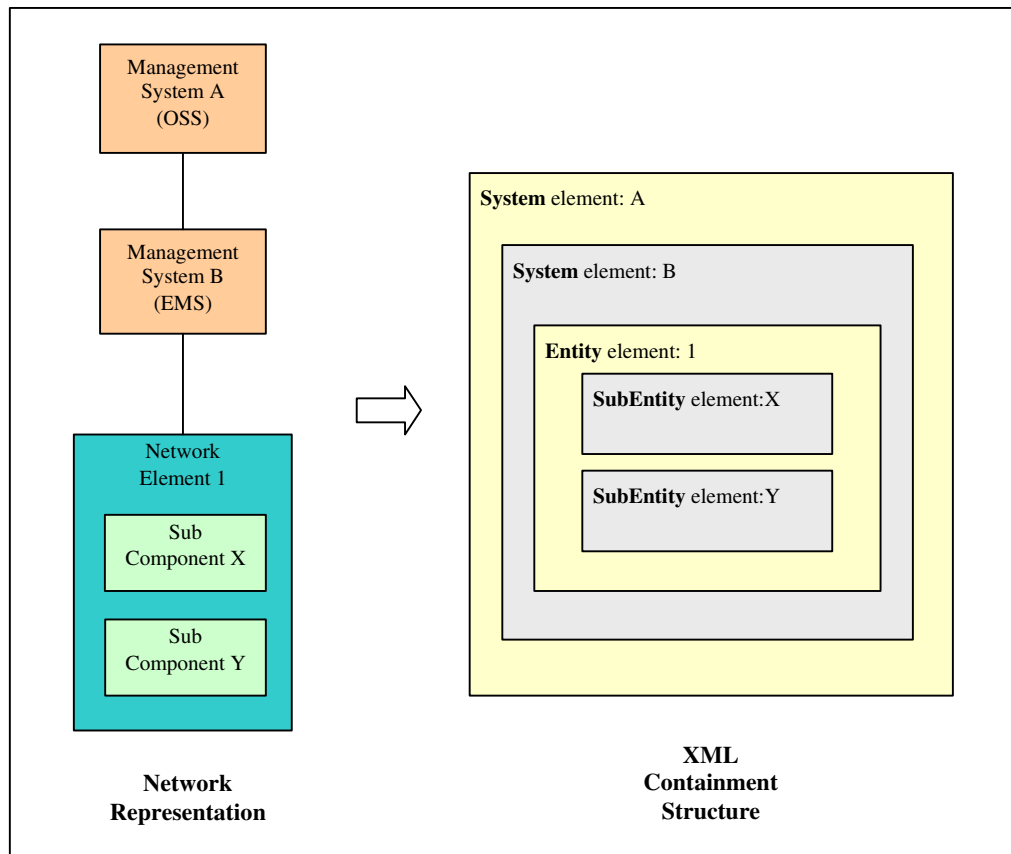
*SubEntity* element.

The intent of the Entity element is to represent the NE itself. What constitutes an NE and what device granularity determines an NE is an implementation choice for any particular product or technology. The System, Entity and SubEntity form a hierarchy. In this hierarchy, the Entity element may appear only once.

A Network Element may contain many sub-components and these sub-components may themselves contain sub-components and so on to some arbitrary level of decomposition. The SubEntity element represents a sub-component within the NE. A SubEntity element may contain other SubEntity elements to reflect the component structure within the NE. What constitutes a sub-component within an NE is, again, an implementation choice for any particular product or technology.

A set of performance measurements may traverse one or more management systems as it travels to some final destination system. Each of these intermediate management systems may be represented by a System element. A System element may contain another System element encoding the sequence of management systems which handle the performance measurement data.

The CPR may be emitted by a management system or by a network element. When an NE emits the record, the top-most XML element within the PMFile element will be an Entity element representing the NE which is sending the measurements. When a management system emits the CPR, the top-most XML element within the PMFile element will be a System element representing the management system.

**OSS/EMS/NE hierarchy encoded in XML elements****Encoding the Performance Measurement Data****Measurement Descriptors**

In general, a performance measurement is some number which is bound to a measurement identifier such as: numberOfPackets = 23145. As well as these two items, a performance measurement may contain contextual information indicating the circumstances under which the measurement was taken or giving some further information as to the meaning of the measurement or its interpretation. The following information items are used in the common performance record format to describe measurement information:

**Measurement Identifier:** This is the name or label which uniquely identifies the measurement.

**Measurement Value:** This is (generally) the numerical value of the measurement (such as an integer or decimal number). Or it could be a string or some enumerated value

Measurement Kind: There are two kinds of performance measurement: 'snapshot' and 'period-based'.

A 'snapShot' measurement is one in which the measurement quantity (for example, some counter in a network device) is sampled at an instant in time and is being reported to the management system. There is no time significance attached to this sampled value. To derive information from a snapshot value, it may need to be compared to some previous snapshot of the counter or gauge and conclusions drawn about the change, if any, between the two values.

In contrast, a period-based measurement represents the value of some measurement quantity in the network device over a specified period of time. The measurement value relates only to activity which occurred within the measurement period.

Capture Time: This is the time at which the measurement value was captured. For a period-based measurement, this is the time at which measurement accrual stopped. For a snapshot measurement, it represents the time at which the measurement was sampled.

Interval Duration: This is the length of the time interval governing the performance measurement. For a period-based measurement, this interval is the duration between the time the measurement was started and the time the measurement was stopped. For a snapshot measurement, the interval indicates the duration between the time the current value was sampled and the time of the previous sample.

Last Record: If true this indicates that the performance measurement is the last value for the reporting time interval (indicated in IntervalDuration).

Reliability: This is an indicator of the quality or reliability of the measurement. It can take values such 'valid', 'invalid' and so on.

Unit: This names the unit in which the measurement is expressed (for example, packets, bytes and so on).

Value Type: This indicates the type of data contained in the Measurement Value. It can take on values such as 'integer', 'decimal', 'string' and so on).

Register Type: A register is the generic name given to the hardware or software capability in an NE which actually records the performance measurement. For numeric values the RegisterType property indicates whether the register behaves as a counter or a gauge or some other numeric register. (A counter is a register which accumulates a count of some defined event such as the arrival

of a packet. A gauge is a register which holds a state of usage sample – for example, the number of items in a queue).

Maximum Value: This property indicates the highest value the register can hold.

Reset Time: This is the register reset time. For numeric values this is the date/time when the register was last reset to zero.

Monitored Time: This indicates the actual duration of the period over which the measurements were taken. This property is used for cases where the actual measurement period is less than the period indicated in the Interval Duration value.

Intervals Covered: As an efficiency mechanism, it may be decided not to forward measurements when they have a value of zero at the end of the measurement period (for example, no events of interest occurred in the measurement period). This practice is called zero-suppression. In the case where a zero suppression representation is used, this attribute specifies the number of consecutive intervals over which a zero value was obtained for the measurement.

### **Table and Group Identifiers**

Performance measurements may be stored within the common format as tables of values or as groups of values. The properties below are used to identify these tables and groups.

Table Identifier: This is the name or label for a particular table of measurements. This property is only used in the Table element.

KeyOfRow: This is a property specific to a column label used in representing tabular measurements. When it has a value of 'true' it indicates that this particular column of the table contains the key of the row of data values. The key is the identity of the object to which the row measurements pertain. This would generally refer to a sub-component in the network element.

Group Identifier: This is the name or label for a particular group of measurements. This property is only used in the GroupOfValues element.

### **Supplementary Identifiers**

In many cases the identity of a network element, NE sub-component or performance measurement can be expressed in a single identifier. In other cases the identity will be contained in a number of individual identifiers. The approach taken in the common performance record format is to use supplementary identifiers to hold any additional identification information required in an element.



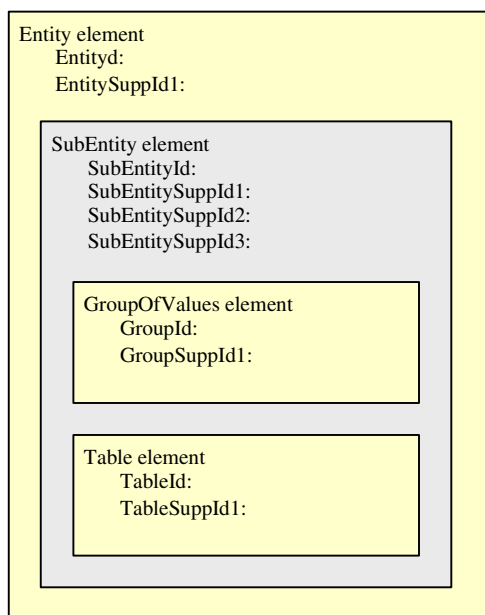
In the case of an *Entity* element (which is used to hold measurements for a particular NE), there are two identifiers: an EntityId (Entity Identifier) and an EntitySuppId (Entity Supplementary Identifier).

Likewise, the *SubEntity* element (which holds measurements for a sub-component of the NE) has a SubEntityId and three supplementary identifiers – SubEntitySuppId1, SubEntitySuppId2 and SubEntitySuppId3. Note that in the case of the *SubEntity* supplementary identifiers, it is not stipulated in which order or in which combination they are to be used. This is left as an implementation decision for any particular product/technology.

The performance measurement itself has a supplementary identifier – MeasureSuppId1. Both the *Table* element and *GroupOfValues* element also have a supplementary identifier – respectively TableSuppId1 and GroupSuppId1.

Some of these identifiers are mandatory and some are optional. See section [“Optionality” on page 138](#) for more information.

#### Example of Identifiers and Supplementary Identifiers



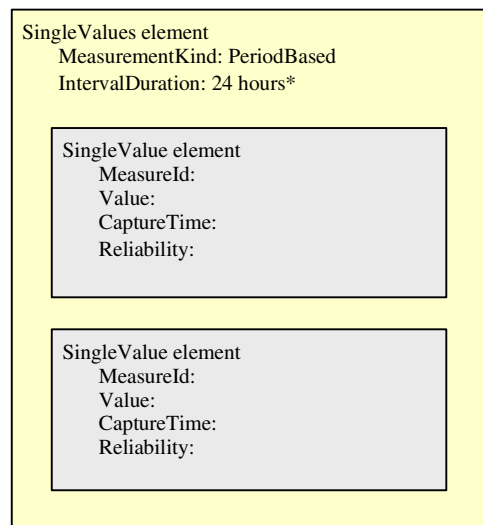
#### Measurement Elements

There are three ways to encode performance measurements in the common format – using a *SingleValues* approach, a *GroupOfValues* approach or a *Table* approach.

## Single Values Approach

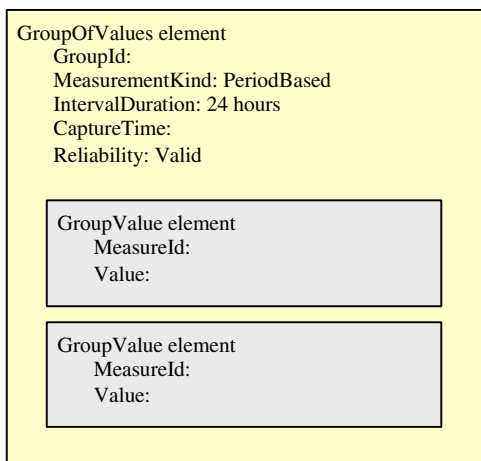
With this approach each performance measurement is considered as a standalone value with no explicit relationship to any other measurement value which may accompany it. Each measurement is encoded in a *SingleValue* element. One or more *SingleValue* elements are contained in a *SingleValues* element which specifies the kind of measurements contained within it (period-based or snapshot) and the interval duration for those measurements (for example, whether they are measurements for a 5-minute, 15-minute or 24-hour interval).

### A SingleValues element containing two values



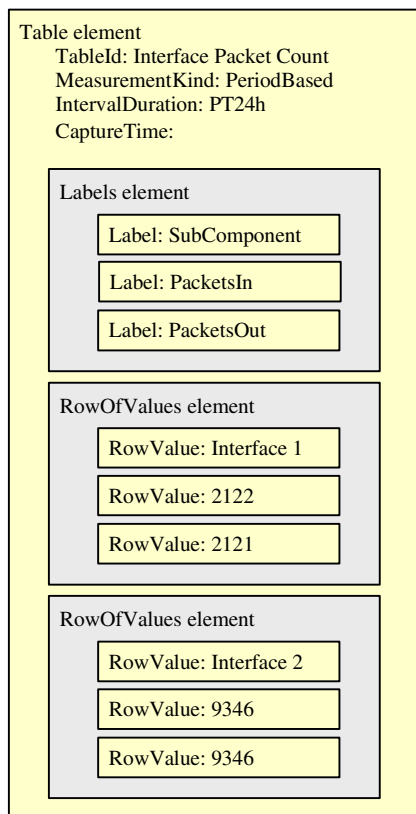
## Group Values Approach

Like the *SingleValues* element, the *GroupOfValues* element contains one or more individual measurements. However, there is an explicit relationship between the measurements in the element. They are part of a group of measurements with a collective identity. The *GroupId* value contains the identity of the group. As with the *SingleValues* element, the *GroupOfValues* element specifies the kind of measurements it contains and their interval duration. In addition, many of the individual measurement properties such as *CaptureTime* and *Reliability* are common to the group and these are encoded once in the *GroupOfValues* element itself rather than being encoded for each measurement in the individual *GroupValue* element.

**A GroupOfValues element containing two measurements****Table Approach**

The table approach encodes performance measurements in a tabular format. A Table element will contain a Labels element to hold the column headings for the table. The Table element will also contain one or more RowOfValues elements. Each RowOfValues element contains a row of individual data items with a one-to-one correspondence to the labels in the Labels element. One or more of the data items in a row may contain key information indicating the source of the measurements (that is, the data item will identify the sub-component from which the measurements were taken). This facet is indicated using the KeyOfRow property in the Label element.

A table may be explicitly identified using a TableId property or it may be an anonymous table with no name.

**A Table element containing two rows of values****Interface Packet Count Table**

| <u>SubComponent</u> | <u>PacketsIn</u> | <u>PacketsOut</u> |
|---------------------|------------------|-------------------|
| Interface 1         | ----             | ----              |

**Top Level Properties**

The performance measurements encoded in the common format constitute an XML string. This set of values will have high level properties in common. These are captured in the PMFile element. The term ‘file’ as used below is intended to designate the XML string containing the performance measurements.

MeasurementCategory: This property describes the type of measurements contained within the PM file (its value is always “PM” indicating the file contains performance measurements).

PMReportType: This describes the type of performance measurement report contained in the file (for example, this property could be used in the case where it is desired to distinguish between different types of PM reports).

FileCreationTime: This specifies the date/time when the PM file was created.

FileSchema: The FileSchema contains information which describes the format of a source non-CPR format PM file or the mapping file used to translate the source file into the common format.

FileSequenceNumber: The position of this file in some sequence of related PM files.

EarliestStartTime: This is set to the start time of the earliest measurement contained in the file.

LatestCaptureTime: This is set to the capture time of the latest measurement in the file.

#### PM File element contents

```
PMFile element
  MeasurementCategory:
  ReportType:
  FileCreationTime:
  FileSequenceNumber:
  EarliestStartTime:
  LatestCaptureTime:
  ValueTypeDefault:
  MaxValueDefault
  RegisterTypeDefault:
```

#### Default Values

ValueType, MaxValue and RegisterType are three properties which may be specified for a measurement (See Measurement Descriptors on page 11). It is possible to set defaults for these values in the file using the ValueTypeDefault, MaxValueDefault and RegisterTypeDefault properties in the top-level *PMFile* element. The scope of these default values is the entire PM file.

It is also possible to specify one or more of ValueType, MaxValue and RegisterType for each *SingleValue* element, each *GroupValue* element or each *Label* element (contained in a *Table* element). This local specification overrides the default value in *PMFile* for the particular element which contains the local specification.

If the property is not locally specified in the *SingleValue*, *GroupValue* or *Label* element, then the default value specified in the *PMFile* element is used.

If a default property is not specified in the *PMFile* element, then the following implicit default values are assumed. These implicit values function as if they were explicitly specified in *PMFile*.

RegisterTypeDefault: “counter”

ValueTypeDefault: “integer”

MaxValueDefault: 4,294,967,295 (that is,  $2^{32} - 1$ )

**Optionality**

It is possible to qualify a performance measurement with very many properties as shown above. Most of these properties are optional and are used in specific technologies or are needed to accommodate specific product performance management practices.

The following is the minimum set of properties required to identify a performance measurement. These are the required properties in a PM file:

**PMFile Element:** MeasurementCategory

**System Element:** SystemId

**Entity:** EntityId

**SubEntity:** SubEntityId

**SingleValues Element:** MeasurementKind

**SingleValue Element:** MeasureId; Value; CaptureTime

**GroupOfValues Element:** GroupId; CaptureTime; MeasurementKind

**GroupValue Element:** MeasureId; Value

**Table Element:** CaptureTime; MeasurementKind

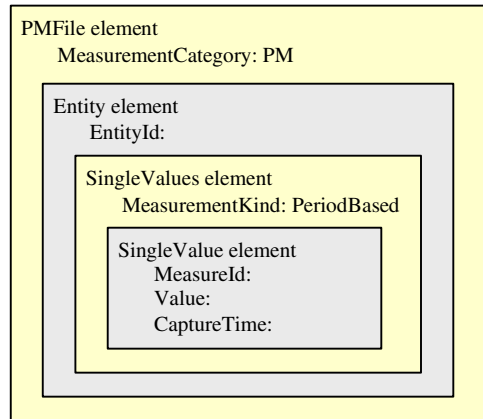
**Labels Element:** N/A

**Label Element:** N/A

**RowOfValues Element:** N/A

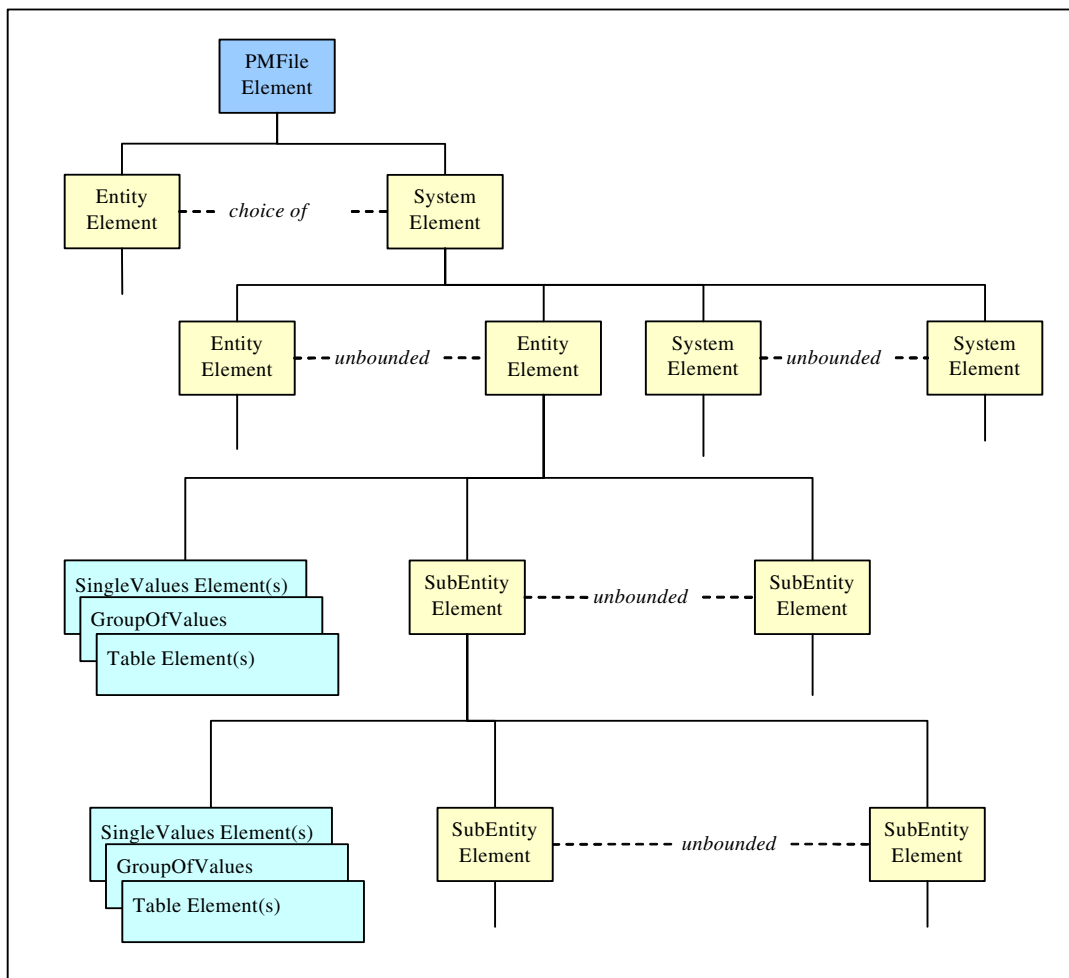
**RowValue Element:** Value

So a minimal CPR file would look like this:

**Minimal Common Record Performance Record file**

The figure below shows the hierarchical relationship of the major XML elements in the common performance record.

### Hierarchy of the major XML elements



### Attribute and Element Encoding

In the common performance record format some information is encoded as element data while other information is encoded using attributes. The approach followed is that attributes are used to encode metadata while elements are used for instance values.

Metadata is data which describes or qualifies some piece of information in terms of its class. So, in the common performance record, the *MeasurementKind* property differentiates between period-based measurements and snapshot measurements. This property is coded as an attribute.

Data which identifies or describes a specific instance of information rather than a class of information is encoded using an element. So the *CaptureTime*



property describes the time instant when a specific measurement was taken and so is not metadata. It is encoded as an element.

It also needs to be mentioned that the common performance record format adopts the approach of encoding the measurement name or label using an XML element. For instance:

**Example 1:** `<MeasureId> numberOfPackets </MeasureId>`

This is in contrast to the approach of directly coding the measurement name as an element tag:

**Example 2:** `<numberOfPackets> </numberOfPackets>`

The requirement for the common performance record format is to have standard fields for measurement information which could be used across all of Nortel (see the Performance Strategy requirements on page 5). This has been achieved using the current approach as shown in Example 1 above.

In order to use a direct coding of the measurement name as the element tag (Example 2 above) would require alignment across Nortel on the identification and semantics of all performance measurements which could possibly be encoded in the common performance record format. This alignment task has not been undertaken yet. It is envisaged that upon completion of such a convergence, the common performance record would be able to evolve to use measurement identifiers as tag names.

An additional concern is sometimes raised concerning the use of tables in the common performance record format. From a theoretical viewpoint, these tables are considered to constitute a lower quality of XML encoding than other means of encoding the data. However the common performance record format has opted to allow a tabular representation of data for pragmatic reasons. Tabular format measurement data has been the norm in most products for many years. Many operations systems expect their performance data to arrive in this customary format. In addition, industry standards for performance measurements such as 3GPP (Third Generation Partnership Project) mandate the use of tables for transporting performance data.

### **Layout of Elements and Attributes in the Common Format**

The two figures below indicate which properties are expressed as elements and which are expressed via attributes. The figures represent one of many combinations of element types which are possible in the common performance record format. (Attributes are shown as *blue italicized* text. Elements are represented as boxes).

**Layout of elements & attributes in the Common Performance Record****PMFile***MeasurementCategory= ;ReportType= ;*

|                            |
|----------------------------|
| <b>FileCreationTime</b>    |
| <b>FileSchema</b>          |
| <b>FileSequenceNumber</b>  |
| <b>EarliestStartTime</b>   |
| <b>LatestCaptureTime</b>   |
| <b>ValueTypeDefault</b>    |
| <b>MaxValueDefault</b>     |
| <b>RegisterTypeDefault</b> |

**System***Type= ; Vendor= ;*

|                      |
|----------------------|
| <b>SystemId</b>      |
| <b>SystemSuppId1</b> |
| <b>AuditSource</b>   |

**Entity***Type= ; Version= ; Vendor= ;*

|                      |
|----------------------|
| <b>EntityId</b>      |
| <b>EntitySuppId1</b> |
| <b>EntityAddress</b> |

**SubEntity***Type= ;*

|                         |
|-------------------------|
| <b>SubEntityId</b>      |
| <b>SubEntitySuppId1</b> |
| <b>SubEntitySuppId2</b> |
| <b>SubEntitySuppId3</b> |

**SingleValues****GroupOfValues****Table**

## Layout of elements &amp; attributes in the CPR-F (cont'd)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------|--------------------------------------------------------------------------|-------|-----------|
| <b>SubEntity</b><br><i>Type= ;</i> <table border="1"> <tr><td>SubEntityId</td></tr> <tr><td>SubEntitySuppId1</td></tr> <tr><td>SubEntitySuppId2</td></tr> <tr><td>SubEntitySuppId3</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                          | SubEntityId | SubEntitySuppId1                                                                                                                                                                                                                                                                                                                                                                      | SubEntitySuppId2 | SubEntitySuppId3 |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| SubEntityId                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| SubEntitySuppId1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| SubEntitySuppId2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| SubEntitySuppId3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>SingleValues</b><br><i>MeasurementKind= ; IntervalDuration= ;</i> <table border="1"> <tr><td>LastRecord</td></tr> </table> <table border="1"> <tr> <td colspan="2"> <b>SingleValue</b><br/> <i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td>MeasureId</td></tr> <tr><td>Value</td></tr> <tr><td>CaptureTime</td></tr> <tr><td>MeasureSuppId1</td></tr> </table> <table border="1"> <tr><td>Reliability</td></tr> <tr><td>ResetTime</td></tr> <tr><td>IntervalsCovered</td></tr> <tr><td>MonitoredTime</td></tr> </table> </td> </tr> </table>                                                                                 |                                                                          | LastRecord  | <b>SingleValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td>MeasureId</td></tr> <tr><td>Value</td></tr> <tr><td>CaptureTime</td></tr> <tr><td>MeasureSuppId1</td></tr> </table> <table border="1"> <tr><td>Reliability</td></tr> <tr><td>ResetTime</td></tr> <tr><td>IntervalsCovered</td></tr> <tr><td>MonitoredTime</td></tr> </table> |                  | MeasureId        | Value                                                                                                                                               | CaptureTime                                                                                                                                                                                                                                           | MeasureSuppId1   | Reliability                                                         | ResetTime                                                                                                                                                          | IntervalsCovered | MonitoredTime |                                                                          |       |           |
| LastRecord                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>SingleValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td>MeasureId</td></tr> <tr><td>Value</td></tr> <tr><td>CaptureTime</td></tr> <tr><td>MeasureSuppId1</td></tr> </table> <table border="1"> <tr><td>Reliability</td></tr> <tr><td>ResetTime</td></tr> <tr><td>IntervalsCovered</td></tr> <tr><td>MonitoredTime</td></tr> </table>                                                                                                                                                                                                                                                                               |                                                                          | MeasureId   | Value                                                                                                                                                                                                                                                                                                                                                                                 | CaptureTime      | MeasureSuppId1   | Reliability                                                                                                                                         | ResetTime                                                                                                                                                                                                                                             | IntervalsCovered | MonitoredTime                                                       |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| MeasureId                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| CaptureTime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| MeasureSuppId1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Reliability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| ResetTime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| IntervalsCovered                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| MonitoredTime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>GroupOfValues</b><br><i>MeasurementKind= ; IntervalDuration= ;</i> <table border="1"> <tr><td>GroupId</td></tr> <tr><td>GroupSuppId1</td></tr> <tr><td>CaptureTime</td></tr> <tr><td>LastRecord</td></tr> <tr><td>Reliability</td></tr> </table> <table border="1"> <tr> <td colspan="2"> <b>GroupValue</b><br/> <i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td>MeasureId</td></tr> <tr><td>Value</td></tr> </table> <table border="1"> <tr><td>MeasureSuppId1</td></tr> <tr><td>ResetTime</td></tr> </table> </td> </tr> </table>                                                                                           |                                                                          | GroupId     | GroupSuppId1                                                                                                                                                                                                                                                                                                                                                                          | CaptureTime      | LastRecord       | Reliability                                                                                                                                         | <b>GroupValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td>MeasureId</td></tr> <tr><td>Value</td></tr> </table> <table border="1"> <tr><td>MeasureSuppId1</td></tr> <tr><td>ResetTime</td></tr> </table> |                  | MeasureId                                                           | Value                                                                                                                                                              | MeasureSuppId1   | ResetTime     |                                                                          |       |           |
| GroupId                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| GroupSuppId1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| CaptureTime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| LastRecord                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Reliability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>GroupValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td>MeasureId</td></tr> <tr><td>Value</td></tr> </table> <table border="1"> <tr><td>MeasureSuppId1</td></tr> <tr><td>ResetTime</td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                          | MeasureId   | Value                                                                                                                                                                                                                                                                                                                                                                                 | MeasureSuppId1   | ResetTime        |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| MeasureId                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| MeasureSuppId1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| ResetTime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>Table</b><br><i>MeasurementKind= ; IntervalDuration= ;</i> <table border="1"> <tr><td>TableId</td></tr> <tr><td>CaptureTime</td></tr> <tr><td>LastRecord</td></tr> <tr><td>Reliability</td></tr> </table> <table border="1"> <tr> <td colspan="2"> <b>Labels</b><br/> <table border="1"> <tr> <td>Label</td> <td><i>KeyOfRow= ; Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i></td> </tr> </table> </td> </tr> </table> <table border="1"> <tr> <td colspan="2"> <b>RowOfValues</b><br/> <table border="1"> <tr> <td>RowValue</td> <td> <table border="1"> <tr> <td>Value</td> <td>ResetTime</td> </tr> </table> </td> </tr> </table> </td> </tr> </table> |                                                                          | TableId     | CaptureTime                                                                                                                                                                                                                                                                                                                                                                           | LastRecord       | Reliability      | <b>Labels</b><br><table border="1"> <tr> <td>Label</td> <td><i>KeyOfRow= ; Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i></td> </tr> </table> |                                                                                                                                                                                                                                                       | Label            | <i>KeyOfRow= ; Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> | <b>RowOfValues</b><br><table border="1"> <tr> <td>RowValue</td> <td> <table border="1"> <tr> <td>Value</td> <td>ResetTime</td> </tr> </table> </td> </tr> </table> |                  | RowValue      | <table border="1"> <tr> <td>Value</td> <td>ResetTime</td> </tr> </table> | Value | ResetTime |
| TableId                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| CaptureTime                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| LastRecord                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Reliability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                          |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>Labels</b><br><table border="1"> <tr> <td>Label</td> <td><i>KeyOfRow= ; Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i></td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                          | Label       | <i>KeyOfRow= ; Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i>                                                                                                                                                                                                                                                                                                                   |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Label                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <i>KeyOfRow= ; Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i>      |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| <b>RowOfValues</b><br><table border="1"> <tr> <td>RowValue</td> <td> <table border="1"> <tr> <td>Value</td> <td>ResetTime</td> </tr> </table> </td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                          | RowValue    | <table border="1"> <tr> <td>Value</td> <td>ResetTime</td> </tr> </table>                                                                                                                                                                                                                                                                                                              | Value            | ResetTime        |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| RowValue                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <table border="1"> <tr> <td>Value</td> <td>ResetTime</td> </tr> </table> | Value       | ResetTime                                                                                                                                                                                                                                                                                                                                                                             |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |
| Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ResetTime                                                                |             |                                                                                                                                                                                                                                                                                                                                                                                       |                  |                  |                                                                                                                                                     |                                                                                                                                                                                                                                                       |                  |                                                                     |                                                                                                                                                                    |                  |               |                                                                          |       |           |

## Common Performance Record Comma Separated Values (CSV) format

The following is an abbreviated generic description of the CPR CSV format. The CPR format is designed to be parsable into or from CPR XML format without loss of information.

The following elements are treated as 'blocks': PMFile, System, Entity, SubEntity, Table, GroupOfValues, SingleValues.

The start and end of these elements are marked or indicated in CSV with unique 'Begin' and 'End' markers. The format of an element block is as follows:

`{element_name}=Begin`

... CSV heading row for attributes & child text element nodes children of <element> ...

... CSV value row for attributes & child text element nodes of <element> ...

... recursive handling of all complex sub-elements (element children that are not text nodes) ...

`{element_name}=End`

For each element, a specific property (attribute or text element) has been selected as the identifier for that element. The identifier will always appear as the *first* of the comma separated values in the CSV representation of that element.

Values that contain commas are enclosed in double quotes in CSV format.

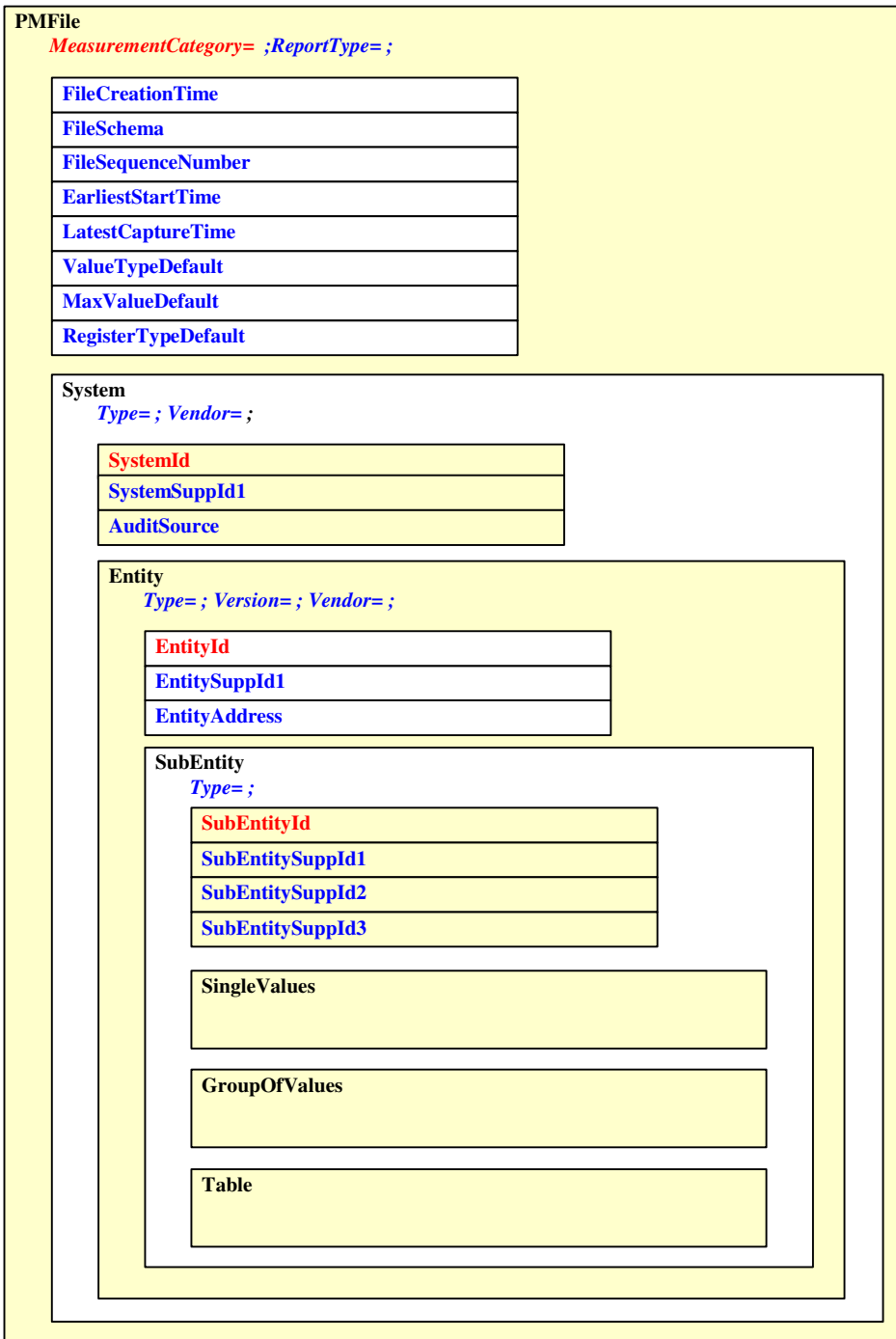
### Element blocks and identifiers

| Element     | Block? | Identifier          |
|-------------|--------|---------------------|
| PMFile      | Y      | MeasurementCategory |
| System      | Y      | SystemId            |
| Entity      | Y      | EntityId            |
| SubEntity   | Y      | SubEntityId         |
| Table       | Y      | TableId             |
| Labels      | N      | Label               |
| RowOfValues | N      | RowValue/Value      |

| Element       | Block? | Identifier      |
|---------------|--------|-----------------|
| GroupOfValues | Y      | GroupId         |
| GroupValue    | N      | MeasureId       |
| SingleValues  | Y      | MeasurementKind |
| SingleValue   | N      | MeasureId       |

As not all identifiers are in fact mandatory, when the identifier is not found in the XML being translated the value of `_Unnamed_` is used in the CSV output where the value of the identifier would normally appear.

For reference, “[Layout of elements & attributes in the Common Performance Record](#)” and “[Layout of elements & attributes in the CPR-F \(cont'd\)](#)” (which had been presented earlier) are shown below. The two figures indicate which properties are considered identifiers for each element, and therefore will always appear as the first comma separated value within a row. (Mandatory identifiers are shown in **red**. Optional identifiers are shown in **blue**. Attributes are shown as *italicized* text. Elements are represented as boxes.)

**Layout of Elements & Attributes in the CPR-F**

## Layout of elements &amp; attributes in the CPR-F (cont'd)

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------|------------------|
| <b>SubEntity</b><br><i>Type= ;</i> <table border="1"> <tr><td><b>SubEntityId</b></td></tr> <tr><td><b>SubEntitySuppId1</b></td></tr> <tr><td><b>SubEntitySuppId2</b></td></tr> <tr><td><b>SubEntitySuppId3</b></td></tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>SubEntityId</b>                                                                                                        | <b>SubEntitySuppId1</b>                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>SubEntitySuppId2</b> | <b>SubEntitySuppId3</b> |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>SubEntityId</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>SubEntitySuppId1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>SubEntitySuppId2</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>SubEntitySuppId3</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>SingleValues</b><br><i>MeasurementKind= ; IntervalDuration= ;</i> <table border="1"> <tr><td><b>LastRecord</b></td></tr> </table> <table border="1"> <tr> <td> <b>SingleValue</b><br/> <i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td><b>MeasureId</b></td></tr> <tr><td><b>Value</b></td></tr> <tr><td><b>CaptureTime</b></td></tr> <tr><td><b>MeasureSuppId1</b></td></tr> </table> <table border="1"> <tr><td><b>Reliability</b></td></tr> <tr><td><b>ResetTime</b></td></tr> <tr><td><b>IntervalsCovered</b></td></tr> <tr><td><b>MonitoredTime</b></td></tr> </table> </td></tr> </table>                                                                                                | <b>LastRecord</b>                                                                                                         | <b>SingleValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td><b>MeasureId</b></td></tr> <tr><td><b>Value</b></td></tr> <tr><td><b>CaptureTime</b></td></tr> <tr><td><b>MeasureSuppId1</b></td></tr> </table> <table border="1"> <tr><td><b>Reliability</b></td></tr> <tr><td><b>ResetTime</b></td></tr> <tr><td><b>IntervalsCovered</b></td></tr> <tr><td><b>MonitoredTime</b></td></tr> </table> | <b>MeasureId</b>        | <b>Value</b>            | <b>CaptureTime</b>                                                                                                                                         | <b>MeasureSuppId1</b>                                                                                                                                                                                                                                                             | <b>Reliability</b>                                                  | <b>ResetTime</b>                                                                                                                                                                                                           | <b>IntervalsCovered</b> | <b>MonitoredTime</b>                                                                                                      |              |                  |
| <b>LastRecord</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>SingleValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td><b>MeasureId</b></td></tr> <tr><td><b>Value</b></td></tr> <tr><td><b>CaptureTime</b></td></tr> <tr><td><b>MeasureSuppId1</b></td></tr> </table> <table border="1"> <tr><td><b>Reliability</b></td></tr> <tr><td><b>ResetTime</b></td></tr> <tr><td><b>IntervalsCovered</b></td></tr> <tr><td><b>MonitoredTime</b></td></tr> </table>                                                                                                                                                                                                                                                                                        | <b>MeasureId</b>                                                                                                          | <b>Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>CaptureTime</b>      | <b>MeasureSuppId1</b>   | <b>Reliability</b>                                                                                                                                         | <b>ResetTime</b>                                                                                                                                                                                                                                                                  | <b>IntervalsCovered</b>                                             | <b>MonitoredTime</b>                                                                                                                                                                                                       |                         |                                                                                                                           |              |                  |
| <b>MeasureId</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>CaptureTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>MeasureSuppId1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>Reliability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>ResetTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>IntervalsCovered</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>MonitoredTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>GroupOfValues</b><br><i>MeasurementKind= ; IntervalDuration= ;</i> <table border="1"> <tr><td><b>GroupId</b></td></tr> <tr><td><b>GroupSuppId1</b></td></tr> <tr><td><b>CaptureTime</b></td></tr> <tr><td><b>LastRecord</b></td></tr> <tr><td><b>Reliability</b></td></tr> </table> <table border="1"> <tr> <td> <b>GroupValue</b><br/> <i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td><b>MeasureId</b></td></tr> <tr><td><b>Value</b></td></tr> </table> <table border="1"> <tr><td><b>MeasureSuppId1</b></td></tr> <tr><td><b>ResetTime</b></td></tr> </table> </td></tr> </table>                                                                                                          | <b>GroupId</b>                                                                                                            | <b>GroupSuppId1</b>                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>CaptureTime</b>      | <b>LastRecord</b>       | <b>Reliability</b>                                                                                                                                         | <b>GroupValue</b><br><i>Unit= ; ValueType= ; MaxValue= ; RegisterType= ;</i> <table border="1"> <tr><td><b>MeasureId</b></td></tr> <tr><td><b>Value</b></td></tr> </table> <table border="1"> <tr><td><b>MeasureSuppId1</b></td></tr> <tr><td><b>ResetTime</b></td></tr> </table> | <b>MeasureId</b>                                                    | <b>Value</b>                                                                                                                                                                                                               | <b>MeasureSuppId1</b>   | <b>ResetTime</b>                                                                                                          |              |                  |
| <b>GroupId</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>GroupSuppId1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>CaptureTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>LastRecord</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>Reliability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
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| <b>MeasureId</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>MeasureSuppId1</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>ResetTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
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| <b>TableId</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>CaptureTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>LastRecord</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>Reliability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
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| <b>RowValue</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <table border="1"> <tr><td><b>Value</b></td></tr> </table> <table border="1"> <tr><td><b>ResetTime</b></td></tr> </table> | <b>Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>ResetTime</b>        |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>Value</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |
| <b>ResetTime</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |                         |                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |                                                                     |                                                                                                                                                                                                                            |                         |                                                                                                                           |              |                  |

## CSV Table example

```

PMFile=Begin
PM,commonFormat.xsd,2004-06-23T13:01:14EST

System=Begin
NortelNetworks/IEMS

Entity=Begin
47.165.168.120,CICM

Table=Begin
.iso.org.dod.internet.mgmt.mib-
  2.rmmon.usrHistory.usrHistoryControlTable.usrHistoryControlEntry,Snapshot,5
,2004-06-23T13:00:00EST
usrHistoryControlInterval,usrHistoryControlIndex,usrHistoryControlStatus,usrHi
storyControlOwner
900,5,1,CICM-120A
Table=End

Table=Begin
.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nortelPerfR
efMIB.nnPerfMetricReferenceTable.nnPerfMetricReferenceEntry,Snapshot,5,200
4-06-23T13:00:02EST
nnPerfMetricValue,nnPerfMetricSources,nnPerfMetricDataType,nnPerfMetricGroup,n
nPerfMetricName,nnPerfMetricRefIndex
0,2,1,CICM,ActiveConnections,5
0,2,1,CICM,PercentageCpuUsed,4
0,2,1,CICM,PercentageMemoryUsed,3
0,2,1,CICM,NumberOfLogs,2
0,2,1,CICM,ActiveSessions,1
Table=End
Entity=End
System=End
PMFile=End

```

|   |                                          |
|---|------------------------------------------|
| } | Table attributes & text elements values  |
| } | Labels attributes & text elements values |
| } | RowOfValues attributes & text elements   |

## CSV SingleValues example

```

PMFile=Begin
PM,commonFormat.xsd,2004-06-23T17:30:21EST

System=Begin
NortelNetworks/IEMS

Entity=Begin
47.174.74.179,Session Server

SingleValues=Begin
Snapshot,5
sysDescr,2004-06-23T17:26:20EST,.iso.org.dod.internet.mgmt.mib-2.system,Linux sp2k-1
2.4.22-samxts #1 Thu May 13 01:48:09 EDT 2004 i686,Valid
snmpOutPkts,2004-06-23T17:26:20EST,.iso.org.dod.internet.mgmt.mib-2.snmp,8639,Valid
snmpInBadVersions,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid
snmpInBadCommunityNames,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,1,Valid
snmpInTotalReqVars,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,9689,Valid
snmpOutTraps,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid
snmpInBadCommunityUses,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid
snmpInPkts,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-2.snmp,8652,Valid
snmpInTotalSetVars,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid
snmpInASNParseErrs,2004-06-23T17:26:21EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid
hrSystemDate,2004-06-23T17:26:22EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,0,Valid
hrSystemUptime,2004-06-23T17:26:22EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,1315598,Valid
hrSystemProcesses,2004-06-23T17:26:22EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,170,Valid
snmpSilentDrops,2004-06-23T17:26:22EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid
SingleValues=End

Entity=End
System=End
PMFile=End

```



## Note on CSV Examples

All CSV examples are with header information suppressed by default. This is the default behavior for all CSV performance reports in the SN08 release.

To have the header information included in the CSV performance reports, the user must change the “suppress-headers” option from “true” to “false”. The “suppress-headers” option is located in the `cprxml2csv.properties` file in the `/opt/nortel/iems/current/resources` directory.

CSV with header information example:

```
PMFile=Begin
MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime
PM,commonFormat.xsd,2004-06-23T12:45:04EST
System=Begin
SystemId
NortelNetworks/IEMS
Entity=Begin
EntityId,Type
47.165.168.120,CICM
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
.iso.org.dod.internet.mgmt.mib-
2.rmon.usrHistory.usrHistoryControlTable.usrHistoryControlEntry,Snapshot,5,2004-06-
23T12:40:00EST
Label,Label,Label,Label
usrHistoryControlInterval,usrHistoryControlIndex,usrHistoryControlStatus,usrHistoryContr
olOwner
Value,Value,Value,Value
900,5,1,CICM-120A
Table=End

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nortelPerfRefMIB.nnPerf
MetricReferenceTable.nnPerfMetricReferenceEntry,Snapshot,5,2004-06-23T12:40:01EST
Label,Label,Label,Label,Label,Label
nnPerfMetricValue,nnPerfMetricSources,nnPerfMetricDataType,nnPerfMetricGroup,nnPerf
MetricName,nnPerfMetricRefIndex
```

```
Value,Value,Value,Value,Value,Value
0,2,1,CICM,ActiveConnections,5
0,2,1,CICM,PercentageCpuUsed,4
0,2,1,CICM,PercentageMemoryUsed,3
0,2,1,CICM,NumberOfLogs,2
2662732,2,1,CICM,ActiveSessions,1
Table=End
Entity=End
System=End
PMFile=End
```

**Note:** Collected performance files (in CSV and XML format) can be forwarded from the IEMS server to an OSS system by configuring an IEMS transfer job. Transfer jobs can be configured to forward these files using FTP or the secure SFTP protocols.

## Inventory/Topology Interface

### Overview

The IEMS provides the ability to perform an ACSII dump of provisioned network inventory/topology information for use by 3rd party systems. The snapshot is initiated from the IEMS user interface and outputs full configuration details of the component hierarchy to the IEMS server as a text file. By default, the data is placed in the file */opt/nortel/iems/current/logs/inventoryData.txt*. This information can then be retrieved and processed by third parties. For a full description of the format and content of these topology listings see the section titled “Dumping Inventory Details” in:

NN10330-511 - Integrated EMS Configuration Management

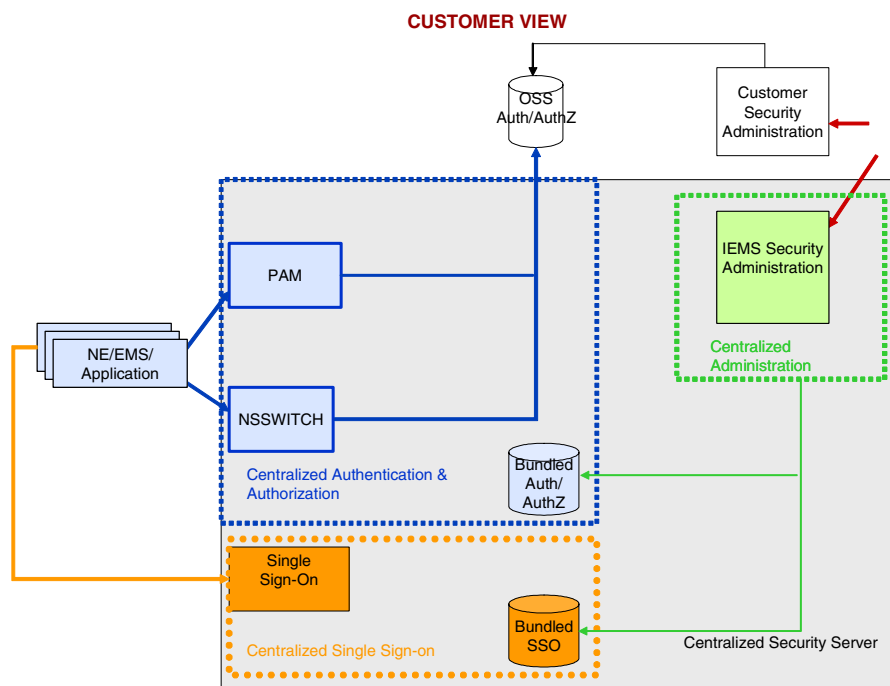
## Network Security

### Centralized Security Administration (Network Security)

#### Overview

The Integrated EMS provides a comprehensive security architecture based on PAM (Pluggable Authentication Module) and NSSwitch (Name Services Switch). The following figure shows the Nortel Networks VoIP Security Architecture.

## Centralized Security Architecture



### Features

This architecture provides the following features:

- Support for central administration of user accounts and user groups
- Support for central authentication: authentication of centrally administered user accounts is performed by the IEMS Security Server.
- Support for central authorization: authorization information needed to support user access control is securely managed and provided by the IEMS Security Server.
- Support for Single Sign-on (SSO)- This capability enables the user to access multiple network elements, applications, and features from a single login session. Session information for a user is shared between IEMS and network elements supporting SSO.
- Customer Plug-ability - provides the ability for third parties to plug-in its own Authentication/Authorization solutions on IEMS. Client authentication and authorization information are provided by the customer's security backend via the IEMS Security Server.

The following table lists the devices and applications supporting these features:

## Authentication and Authorization

### Central Security Administration -Supported Devices

| <b>Network Element/EMS Platforms</b>                                                                                                                                 | <b>Device Authentication Method</b> | <b>Device Reference Documentation</b>                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------|
| USP                                                                                                                                                                  | HTTPS                               | USP Security and Administration, NN10159-611                   |
| Ethernet Routing Switch 8600                                                                                                                                         | Radius                              | Configuring and Managing Security, 314724-B                    |
| SSPFS<br>CS 2000 Management Tools (ossgate, sam2em, gwcem, uasem, apsem, lmm, tmm, Audio Provisioning Server (APS)<br>Network Patch Manager (NPM)<br>MG 9000 Manager | Radius                              | ATM/IP Solution-level Security and Administration, NN10402-600 |
| Integrated EMS                                                                                                                                                       | HTTPS                               | Integrated EMS Security and Administration, NN10336-611        |
| GWC                                                                                                                                                                  | PAM Proxy                           | ?                                                              |
| Integrated EMS                                                                                                                                                       | HTTPS                               | Integrated EMS Security and Administration, NN10336-611        |
| CICM Manager                                                                                                                                                         | HTTPS                               | Integrated EMS Security and Administration, NN10336-611        |
| SDM                                                                                                                                                                  | Radius                              | ?                                                              |
| MDM and MDM Operator Client, PAM and Sun ONEIS                                                                                                                       | Radius                              | ?                                                              |
| MG15000 (previously PVG)                                                                                                                                             | Radius                              | ?                                                              |
| CEM                                                                                                                                                                  | PAM Proxy                           | ?                                                              |
| MG9K                                                                                                                                                                 | Radius                              | ?                                                              |

The following table lists Integrated EMS single sign-on launch points.

**Integrated EMS single sign-on launch points**

| <b>Network element/EMS platform/application</b> | <b>Integrated EMS launch point</b>         |
|-------------------------------------------------|--------------------------------------------|
| USP                                             | USP Command Line<br>USP Manager            |
| Ethernet Routing Switch 8600                    | PP8600 Command Line                        |
| SSPFS                                           | CS 2000 Management Tools                   |
| CS 2000 Management Tools                        |                                            |
| Audio Provisioning Server (APS)                 |                                            |
| Network Patch Manager (NPM)                     |                                            |
| MG 9000 Manager                                 |                                            |
| SAM21 Manager                                   | SAM21 Manager                              |
| UAS Manager                                     | UAS Manager                                |
| LMM                                             | LMM                                        |
| TMM                                             | TMM                                        |
| OSSGate                                         | OSSGate<br>BPT Servlet<br>BPT Command Line |
| MG9000 Manager                                  | MG9000 Manager                             |
| MG9000 Mid-Tier                                 |                                            |
| APS                                             | APS Manager<br>APS Application             |
| NPM                                             | NPM<br>NPM Command Line                    |
| QOS                                             | QOS Command Line                           |
| CEM                                             | CEM                                        |
| SSPFS                                           | SSPFS                                      |

Network Elements and Applications can be configured to use Centralized Security Administration. To enable a device to use Centralized Security Administration, the device must be configured to use the IEMS central security server to authenticate users and access user profile information.

The IEMS Central Security Server uses PAM (Pluggable Authentication Module) to process the authentication requests and NSSwitch (Name Services Switch) to return user privilege and user profile information to Network Elements and Applications.

### **PAM Services**

PAM provides authentication services for clients in the managed network. Customers have the option to use the PAM services that come pre-bundled with the security server or to provide their own. When customers use the PAM services provided by the IEMS Security Server, the user accounts are managed via the IEMS security and administration GUI.

When a request is forwarded to the IEMS PAM SPI (PAM Service Provider), then authentication is performed against data provisioned and administered by the Security Administration application on the IEMS client.

Conversely, when a PAM services are provided by a customer, incoming authentication requests are forwarded to the customer SPI for resolution against their remote database.

### **NSSwitch Services**

NSSwitch provides services to obtain group and profile information for users. Centralized access to network resources depends on the definition of a common set of user groups to map security access for each user. The Nortel Networks solution provides a number of predefined user groups to address the full range of OAM&P functions required across a managed network. For a full discussion of these user groups and their categorization, see *NN10281-600 - ATM/IP Administration and Security*.

Customers can configure NSSwitch to use the service pre-bundled with IEMS or, as with PAM services, provide their own service remotely. When the pre-bundled service is used, group and user profile information is administered via the IEMS security and administration GUI. See NN10336-611 - IEMS Administration and Security.

If NSSwitch services are configured on a third party system, it is important to note that this security solution supports *only* the NSSwitch group and password databases. Although other database types may be defined in NSSwitch, they are not used by the central security feature.

See the References section for additional information on PAM and NSSwitch.

### **Single Sign-on (SSO)**

The Single Sign-on feature allows users transparent access to multiple network elements and applications through a single login.

Once a user has been successfully authenticated for the first time (by user login), an SSO token is created by the IEMS security server that will be used to authenticate the same user on subsequent login attempts.

Network Elements and Applications use a Single Sign-On (SSO) interface on the Central Security Server to request SSO tokens whenever authentication is required.

For full details on the interface specification, see *NN10336-611 - IEMS Administration and Security*.

## Configuring Security Administration

### Managing Accounts

It is recommended practice that all user accounts be managed centrally with the following exceptions:

- accounts required to provide emergency access to a device.
- super user accounts (for example ‘root’ users)

For more information on adding a centrally managed user, refer to the “Adding New Users” section of *IEMS Administration and Security*.

**Note:** Detailed procedures for these steps can be found in *NN10336-611 - IEMS Administration and Security*.

### Configuring Centralized Security Administration on NEs and EMS Platforms

An OSS must configure NEs and EMS Platforms to use centralized security administration. To enable centralized security administration on a device, the OSS must follow the procedures outlined for the device. For security configuration information for a specific device, look for its listing in the “Supported Devices” section of this document.

**Note:** Detailed procedures for these steps can be found in *NN10336-611 - IEMS Administration and Security*.

# IEMS Supported Devices

The sections that follow contain a directory to provide customers a quick reference to device-specific information on faults, performance, interfaces, and other user documentation. The intended purpose is to allow customers to correlate IEMS Northbound interface events and behaviors with their originating source.

Each device in the listings below provide sample logs from all four Northbound fault streams: SCC2, NTSTD, Syslog, and SNMP. With the exception of the SNMP fault feed, these samples are shown as they appear from the Northbound interfaces.

## Understanding SNMP Fault samples

Since SNMP has no inherent display format, each event is presented in a format that displays the short name of the MIB variables populated by the event:

*<short MIB variable Name> => <value>*

for example:

**nnExtAlarmActiveResourceDescription =>**  
IEMS=nc0rtp2127.us.nortel.com-MS2000;

The following table provides a mapping of the displayed “short” variable name to its full form as well as its associated OID.

**OID Short Name Mapping in SNMP Log Samples**

|            |                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------|
| Short name | <b>sysUpTime</b>                                                                                 |
| Long name  | <b>system.sysUpTime.0</b>                                                                        |
| OID        | <b>.1.3.6.1.2.1.1.3</b>                                                                          |
| Short name | <b>snmpTrapOID.0</b>                                                                             |
| Long name  | <b>.iso.org.dod.internet.snmpV2.snmpModules.snmpMIB.snmpMIBObjects.snmpTrap.snmpTrapOID.0</b>    |
| OID        | <b>.1.3.6.1.6.3.1.1.4.1</b>                                                                      |
| Short name | <b>alarmActiveResourceId</b>                                                                     |
| Long name  | <b>alarmMIB.alarmObjects.alarmActive.alarmActiveTable.alarmActiveEntry.alarmActiveResourceId</b> |
| OID        | <b>.1.3.6.1.2.1.111.1.2.2.1.10</b>                                                               |
| Short name | <b>alarmActiveDateAndTime</b>                                                                    |



|            |                                                                                                                                                              |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Long name  | <b>alarmMIB.alarmObjects.alarmActive.alarmActiveTable.alarmActiveEntry.alarmActiveDateAndTime</b>                                                            |
| OID        | .1.3.6.1.2.1.111.1.2.2.1.2                                                                                                                                   |
| Short name | <b>alarmActiveDescription</b>                                                                                                                                |
| Long name  | <b>alarmMIB.alarmObjects.alarmActive.alarmActiveTable.alarmActiveEntry.alarmActiveDescription</b>                                                            |
| OID        | .1.3.6.1.2.1.111.1.2.2.1.11                                                                                                                                  |
| Short name | <b>nnExtAlarmActiveEventType</b>                                                                                                                             |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveEventType</b>            |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.1                                                                                                                                |
| Short name | <b>nnExtAlarmActiveProbableCause</b>                                                                                                                         |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveProbableCause</b>        |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.2                                                                                                                                |
| Short name | <b>nnExtAlarmActiveAdditionalText</b>                                                                                                                        |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveAdditionalText</b>       |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.3                                                                                                                                |
| Short name | <b>nnExtAlarmActiveDocumentationPointer</b>                                                                                                                  |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveDocumentationPointer</b> |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.4                                                                                                                                |
| Short name | <b>nnExtAlarmActiveResourceDescription</b>                                                                                                                   |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveResourceDescription</b>  |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.5                                                                                                                                |
| Short name | <b>nnExtAlarmActiveManualClear</b>                                                                                                                           |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveManualClear</b>          |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.6                                                                                                                                |

|            |                                                                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Short name | <b>nnExtAlarmActiveSequenceNumber</b>                                                                                                                                                        |
| Long name  | <b>enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmActiveTable.nnExtAlarmActiveEntry.nnExtAlarmActiveSequenceNumber</b>                                       |
| OID        | .1.3.6.1.4.1.562.29.6.1.1.1.7                                                                                                                                                                |
| Short name | <b>nnExtAlarmMessageResource</b>                                                                                                                                                             |
| Long name  | <b>.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmMessageTable.nnExtAlarmMessageEntry.nnExtAlarmMessageResource</b>            |
| OID        | .1.3.6.1.4.1.562.29.6.1.3.1.1                                                                                                                                                                |
| Short name | <b>nnExtAlarmMessageResourceDescription</b>                                                                                                                                                  |
| Long name  | <b>iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmMessageTable.nnExtAlarmMessageEntry.nnExtAlarmMessageResourceDescription</b>  |
| OID        | .1.3.6.1.4.1.562.29.6.1.3.1.2                                                                                                                                                                |
| Short name | <b>nnExtAlarmMessageDateAndTime</b>                                                                                                                                                          |
| Long name  | <b>iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmMessageTable.nnExtAlarmMessageEntry.nnExtAlarmMessageDateAndTime</b>          |
| OID        | .1.3.6.1.4.1.562.29.6.1.3.1.3                                                                                                                                                                |
| Short name | <b>nnExtAlarmMessageDocumentationPointer</b>                                                                                                                                                 |
| Long name  | <b>iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmMessageTable.nnExtAlarmMessageEntry.nnExtAlarmMessageDocumentationPointer</b> |
| OID        | .1.3.6.1.4.1.562.29.6.1.3.1.4                                                                                                                                                                |
| Short name | <b>nnExtAlarmMessageInfo</b>                                                                                                                                                                 |
| Long name  | <b>iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nnExtAlarmMIB.nnExtAlarmObjects.nnExtAlarmMessageTable.nnExtAlarmMessageEntry.nnExtAlarmMessageInfo</b>                 |
| OID        | .1.3.6.1.4.1.562.29.6.1.3.1.5                                                                                                                                                                |

## Call Agent Core

This section contains IEMS Northbound log samples and device documentation references for the Call Agent Core.

## Call Agent Core Fault Interface

### Fault documentation for Call Agent Core:

- NN10275-909 - Succession fault Management logs Reference
- NN10083-911 - Communication Server 2000 Fault Management

### DMS Standard (North America)

- 297-8021-840 - North American DMS100 Log Report Reference Manual Volumes 1 to 8

### International Succession

- 297-9051-8401 - DMS100 Log Report Reference Manual Volumes 1 to 7

### Fault Mapping for Call Agent Core

The following criteria can be used for looking up information on specific faults for Call Agent Core.

#### Fault Correlation for Call Agent Core

| NB format -><br>Device/EM | SCC2                    | NTSTD                   | SNMP                    | Syslog                  | Document Reference                                     |
|---------------------------|-------------------------|-------------------------|-------------------------|-------------------------|--------------------------------------------------------|
| <b>Call Agent Core</b>    | log name and log number | log name and log number | log name and log number | log name and log number | see section “Fault documentation for Call Agent Core:” |

### Northbound Fault Formats for Call Agent Core

#### SCC2

The following is an example of a Call Agent Core log in SCC2 format:

```
56 LINE138 3778 INFO TRMT
      SLOA 21 1 02 01      DN 2145202111
      TREATMENT SET = BUSY      CALLED NO =      5202111
      CALLID= 01BE 036D
```

#### NTSTD

The following is an example of a Call Agent Core log in NTSTD format:

```
RTPU07BR      LINE138 Jan23 16:56:30 3778 INFO TRMT
              SLOA 21 1 02 01      DN 2145202111
              TREATMENT SET = BUSY   CALLED NO =                5202111
              CALLID= 01BE 036D
```

## SNMP

The following is an example of a Call Agent Core log in SNMP format:

```
system.sysUpTime.0 => 19:51:46
snmpTrapOID.0 => nnExtAlarmMessage
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr;
nnExtAlarmMessageDateAndTime => 2004-1-23,11:56:30.0,
nnExtAlarmMessageDocumentationPointer => LINE138
nnExtAlarmMessageInfo => 56 LINE138 3778 INFO TRMT              SLOA 21 1 02 01
DN 2145202111
              TREATMENT SET = BUSY   CALLED NO =                5202111
              CALLID= 01BE 036D
```

## Syslog

The following is an example of a Call Agent Core log in Syslog format:

```
Feb 23 11:57:27 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=3835~~ LINE138 NONE INFO
TRMT^M      SLOA 21 1 02 01      DN 2145202111 ^M      TREATMENT SET = BUSY   CALLED
NO =                5202111 ^M      CALLID= 01BE 036D
```

## Performance

### OM and PM Documentation references for Call Agent Core

- NN10149-711 - Communications Server 2000 Performance Management

#### DMS Standard (North America)

- 297-8021-814P1 - North American DMS-100 Operational Measurements Reference Manual Volumes 1 to 6

#### International Succession

- 297-9051-8141 - DMS-100 Family Operational Measurements Reference Manual Volumes 1 to 6

## Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

Performance measurements for Call Agent Core are available from the CS2K Core Manager. See NN10149-711 - Communications Server 2000 Performance Management for more information.

### XML

The following is an example of Performance data for Call Agent Core in XML format:

***Note:** The IEMS northbound performance interface does not support this device.*

### CSV

The following is an example of Performance data for Call Agent Core in CSV format:

***Note:** The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for Call Agent Core

The Call Agent Core provides both command-line and MAP-based interfaces accessed through the CS2000 Core Manager.

### GUI/CLUI Launching and User procedures

- NN10018-111 - CS2000 Core Manager Basics  
see section “Accessing the Core”

### Related documents

- NN10197-111 - Communication Server 2000 Basics
- NN10193-511 - Communication Server 2000 Configuration Management
- NN10127-811 - Communication Server 2000 Accounting Management
- NN10171-611 - Communication Server 2000 Security and Administration
- 297-5051-921 - SuperNode Data Manager DDMS ASCII CI Gateway User Guide
- 297-5161-022P1 - Advanced Intelligent Network Service Enablers SIG Volumes 1 to 3
- 297-8021-350P1 - North American DMS-100 Translations Guide Volumes 1 to 25

- 297-8021-351P1 - DMS-100 Data Schema Reference Manual (volumes 1 to 12)
- 297-8021-801 - DMS-100 Feature Guide
- 297-8021-808P1 - DMS-100 SERVORD Reference Manual
- 297-8021-808P2 - DMS-100 SERVORD Reference Manual
- 297-8021-814P1 - DMS-100 Operational Measurements Reference Manual (volumes 1 to 6)
- 297-8021-840P1 - DMS-100 Logs Reference Manual (volumes 1 to 6)
- 297-8021-855P1 - DMS-100 Office Parameters Reference Manual (volumes 1 to 3)
- 297-8991-810 - XA-Core Reference Manual

## Call Agent Platform

This section contains IEMS Northbound log samples and device documentation references for the Call Agent Platform.

### Call Agent Platform Fault Interface

#### Fault documentation for Call Agent Platform:

- NN10087-911 - Call Agent Fault Management

#### Fault Mapping for Call Agent Platform

The following criteria can be used for looking up information on specific faults for Call Agent Platform.

**Fault Correlation for Call Agent Platform**

| NB format -><br>Device/EM  | SCC2               | NTSTD              | SNMP               | Syslog             | Document Reference                         |
|----------------------------|--------------------|--------------------|--------------------|--------------------|--------------------------------------------|
| <b>Call Agent Platform</b> | logname and number | logname and number | logname and number | logname and number | NN10087-911<br>Call Agent Fault Management |

### Northbound Fault Formats for Call Agent Platform

#### SCC2

The following is an example of a Call Agent Platform log in SCC2 format:

```
* 41 CCA 355 6064 FLT Jam Inactive Unit
Unit Number : 0, ACTIVE
Description : Inactive JAMMED
```

## NTSTD

The following is an example of a Call Agent Platform log in NTSTD format:

```
COMPACT06BT * CCA355 JAN21 18:41:14 1864 FLT Jam Inactive Unit
Unit Number : 0, ACTIVE
Description : Inactive JAMMED
```

## SNMP

The following is an example of a Call Agent Platform log in SNMP format:

```
system.sysUpTime.0 => 1 day, 4:49:05
snmpTrapOID.0 => nnExtAlarmMinor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.49.44.54.58.52.49.58.49.52.46.48.44.8995
alarmActiveDateAndTime => 2004-1-21,6:41:14.0,
alarmActiveDescription => The inactive unit is jammed.
Description : Inactive JAMMED
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => CCA 355
nnExtAlarmActiveResourceDescription => IEMS=47.142.128.16-CS2K-Mgr;
nnExtAlarmActiveManualClear => 3
nnExtAlarmActiveSequenceNumber => 9104
```

## Syslog

The following is an example of a Call Agent Platform log in Syslog format:

```
Jan 21 19:41:06 wnc0s0qh IEMS: _V2_~I=~H=wnc0s0qh~A=IEMS~S=2860~~ CCA355 MINOR FLT
Jam Inactive Unit^M Unit Number : 0, ACTIVE ^M Description : Inactive JAMMED
```

## Performance

### OM and PM Documentation references for Call Agent Platform

- NN10153-711 - Call Agent Performance Management

### Northbound OM/PM Formats

Performance measurements for Call Agent Platform are available only from the Call Agent Manager interface. See NN10153-711 - Call Agent Performance Management for more information.

#### XML

The following is an example of Performance data for Call Agent Platform in XML format:

***Note:** The IEMS northbound performance interface does not support this device.*

#### CSV

The following is an example of Performance data for Call Agent Platform in CSV format:

***Note:** The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for Call Agent Platform

### GUI Launching and User procedures

- NN10175-611 - Call Agent Administration and Security

### Related documents

- NN10023-111 - Call Agent Basics
- NN10109-511 - Call Agent Configuration Management

## Core Element Manager (CEM)

This section contains IEMS Northbound log samples and device documentation references for the Core Element Manager.



## CEM Fault Interface

This section will provide references to customer documentation for Fault, Performance, Topology, GUI/CLUI, and Security for CEM.

### Fault documentation for CEM:

The document that describes CEM faults is CEM Logs and OMs - Integrated EMS Fault Management, NN10334-911- I.

### Fault Mapping for CEM

The following criteria can be used for looking up information on specific faults for CEM.

**Table 1 Fault Correlation for CEM**

| NB format -> | SCC2                                | NTStd                               | SNMP                 | Syslog                              | Document Reference |
|--------------|-------------------------------------|-------------------------------------|----------------------|-------------------------------------|--------------------|
| Device/EM    |                                     |                                     |                      |                                     |                    |
| <b>CEM</b>   | Description log name and log number | Description log name and log number | Device specific info | Description log name and log number | NN10334-911- I     |

## Northbound Fault Formats for CEM

### SCC2

The following is an example of a CEM log in SCC2 format:

#### info event:

```
58 CSEM600 0069 INFO Log
Equip Id: 250Q C7SP
Notification Id: 0000042693
Category: communications
Cause: unableToSSTreply
ComponentId: C7SP
LogKey: CCS224
Description:
"RTPU08AZI | | ICCS224|JAN19|13:57:30|8844|INFO|No reply SST Invd CGPA

SSN = 100,
CGPA: VALID  ANSI7 43 0 1 ANSI7 252 050 006
GTNAME: INVALID UNKNOWN 208 164 94 00 OCTET
DIGITS:
I1106161126"
```

**alarm raise or clear:**

```
* 00 CSEM300 0083 TBL Alarm set
Equip Id: 250Q SDM-0
Notification Id: 0000042700
Category: processingError
Cause: applStatusChange
ComponentId: SDM-0
LogKey: SDM550
Description:
"RTPU08AZI |** | |SDM550|JAN19|13:59:04|8861|INFO|Node Status Change
Node: SDM 0
Status: ** ISTb from ** ISTb
Reason: DCE unavailable alarm
|1106161220"
```

**NTStd**

The following is an example of a CEM log in NTStd format:

**info event:**

```
znc0s0jh CSEM600 JAN19 13:58:58 0071 INFO Log
Equip Id: 250Q MPC-1
Notification Id: 0000042694
Category: equipment
Cause: mpcINFO
ComponentId: MPC-1
LogKey: MPC101
Description:
"RTPU08AZI | | |IMPC101|JAN19|13:57:43|8845|INFO|MPC_INFORMATION_REPORT
REASON = 19
UNABLE TO DOWNLOAD MPC. FILE-ID NOT FOUND.
MPC = 1

|1106161138"
```

**alarm raise or clear:**

```

znc0s0jh * CSEM300 JAN19 14:00:20 0083 TBL Alarm set
Equip Id: 250Q SDM-0
Notification Id: 0000042700
Category: processingError
Cause: applStatusChange
ComponentId: SDM-0
LogKey: SDM550
Description:
"RTPU08AZI|**| |SDM550|JAN19|13:59:04|8861|INFO|Node Status Change
Node: SDM 0
Status: ** ISTb from ** ISTb
Reason: DCE unavailable alarm
l1106161220"

```

## SNMP

The following is an example of a CEM log in SNMP format for **event**:

### info event:

sysUpTime. => 1:56:59

snmpTrapOID. => nnExtAlarmMessage

nnExtAlarmMessageResource => .0.0

nnExtAlarmMessageResourceDescription =>  
IEMS=250Q@rtpu@47.142.94.68;MPC-1

nnExtAlarmMessageDateAndTime => 2005-1-19,1:58:58.0

nnExtAlarmMessageDocumentationPointer => MPC101

nnExtAlarmMessageInfo => 58 CSEM600 0071 INFO Log

```

"RTPU08AZI| | |
|MPC101|JAN19|13:57:43|8845|INFO|MPC_INFORMATION_REPORT
REASON = 19

```

UNABLE TO DOWNLOAD MPC. FILE-ID NOT FOUND.

MPC = 1

l110616

**clear alarm:**

sysUpTime. => 4:50:21

snmpTrapOID. => nnExtAlarmClear

mib-2. =>

.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.11  
6.20.50.48.48.53.45.49.45.49.57.44.49.58.53.51.58.53.50.46.48.44.45906

mib-2. => 054

mib-2. => DeviceSpecificInfo="RTPU08AZ|\*\*|  
|SDM550|JAN19|13:52:37|8807|INFO|Node Status Change

Node: SDM 0

Status: \*\* ISTb from \*\* ISTb

Reason: DCE unavailable alarm

l1106160832"

nnExtAlarmActiveEventType => 3

nnExtAlarmActiveProbableCause => 118

nnExtAlarmActiveAdditionalText =>

nnExtAlarmActiveDocumentationPointer =>

nnExtAlarmActiveResourceDescription =>  
IEMS=250Q@rtpu@47.142.128.85;

nnExtAlarmActiveSequenceNumber => 4629

**minor alarm:**

sysUpTime. => 1:58:22

snmpTrapOID. => nnExtAlarmMinor

mib-2. =>

.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.11  
6.19.50.48.48.53.45.49.45.49.57.44.50.58.48.58.50.48.46.48.44.2

mib-2. => Õ

mib-2. => DeviceSpecificInfo=applStatusChange;"RTPU08AZI|\*\*|  
ISDM550|JAN19|13:59:04|8861|INFO|Node Status Change

Node: SDM 0

Status: \*\* ISTb from \*\* ISTb

Reason: DCE unavailable alarm

|1106161220"

nnExtAlarmActiveEventType => 3

nnExtAlarmActiveProbableCause => 118

nnExtAlarmActiveAdditionalText =>

nnExtAlarmActiveDocumentationPointer => SDM550

nnExtAlarmActiveResourceDescription =>  
IEMS=250Q@rtpu@47.142.94.68;SDM-0

nnExtAlarmActiveManualClear => 2

nnExtAlarmActiveSequenceNumber => 3

### **major alarm:**

sysUpTime. => 4:50:22

snmpTrapOID. => nnExtAlarmMajor

mib-2. =>

.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.11  
6.19.50.48.48.53.45.49.45.49.57.44.50.58.48.58.50.49.46.48.44.45917

mib-2. => Õ

mib-2. => DeviceSpecificInfo=sdmBaseMaintenance;"RTPU08AZI|\*\*|  
ISDM317|JAN19|14:00:19|8862|TBL|SDM Base Maintenance

DCE problem detected

Reason: sec client service failed: Waited for 5 minutes and DCED had  
not initialized

nnExtAlarmActiveEventType => 3

nnExtAlarmActiveProbableCause => 118

nnExtAlarmActiveAdditionalText =>

nnExtAlarmActiveDocumentationPointer => SDM317

nnExtAlarmActiveResourceDescription =>  
IEMS=250Q@rtpu@47.142.128.85;SDM-0

nnExtAlarmActiveManualClear => 4

nnExtAlarmActiveSequenceNumber => 4630

**critical alarm:**

## Syslog

The following is an example of a CEM log in Syslog format:

### info event:

```
Aug 1 18:30:17 znc0s0jh IEMS:
_V2_~I=~H=znc0s0jh~A=IEMS~S=0444~~ CSEM600 NONE INFO
Log^M Equip Id: 250Q C7SP^M Notification Id: 0000048176^M
Category: communications^M Cause: unableToSSTreply^M
ComponentId: C7SP^M LogKey: CCS224^M Description:^M
"RTPU08AZI| |CCS224|JAN20|00:32:43|8642|INFO|No reply SST Invd
CGPA^M ^M SSN = 100,^M CGPA: VALID ANSI7
43 0 1 ANSI7 252 050 006 ^M GTNAME: INVALID
UNKNOWN 208 164 94 00 OCTET ^M DIGITS: ^M
|1106199239"
```

### alarm raise or clear:

```
Aug 1 18:30:27 znc0s0jh IEMS:
_V2_~I=~H=znc0s0jh~A=IEMS~S=0451~~CSEM300 MINOR TBL Alarm
set^M Equip Id: 250Q SDM-0^M Notification Id: 0000048178^M
Category: processingError^M Cause: applStatusChange^M
ComponentId: SDM-0^M LogKey: SDM550^M Description:^M
"RTPU08AZ||**||SDM550|JAN20|00:32:53|8644|INFO|Node Status Change
^M Node: SDM 0^M Status: ** ISTb from ** ISTb
^M Reason: DCE unavailable alarm^M |1106199249"
```

## Performance

### OM and PM Documentation references for CEM

- Not supported in SN08

### Northbound OM/PM Formats

N/A

## GUI/CLUI Documentation for CEM

### GUI Launching and User procedures

- Adding a Core Element Manager - Integrated EMS Configuration Management NN10330-511
- Launching a Core Element Manager - Integrated EMS Basics, NN10329-111
- CEM Overview and GUI description - Integrated EMS Basics, NN10329-111

### Related documents

- Adding a Core Element Manager - Integrated EMS Configuration Management NN10330-511
- Launching a Core Element Manager - Integrated EMS Basics, NN10329-111
- CEM Logs and OMs - Integrated EMS Fault Management, NN10334-911-
- CEM Overview and GUI description - Integrated EMS Basics, NN10329-111 and Solution-level Configuration or Solution-level Overview (number tbd)
- CEM Restore - Solution level Security and Administration, NN10402-600
- Synchronous Backup Manager procedures - Solution level Security and Administration, NN10402-600

## Centrex IP Call Manager (CICM)

This section contains IEMS Northbound log samples and device documentation references for the CICM.

### CICM Fault Interface

#### Fault documentation for CICM:

- NN10334-911-- IEMS Fault Management

#### Fault Mapping for CICM

The following criteria can be used for looking up information on specific faults for CICM.

##### Fault Correlation for CICM

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                     |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------------------|
| CICM                      | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10334-911<br>- IEMS Fault<br>Management |

### Northbound Fault Formats for CICM

#### SCC2

The following is an example of a CICM log in SCC2 format:

\* 02 CICM359 0001 FLT CICM Fault

Location: 47.165.168.120

Notification Id: 7

State: Raised

Category: equipment

Cause: equipmentMalfunction(15)

Time: Jun 17 09:02:08 2004

Component Id: CICM=CICM-120A;NodeType=Cicm;Component=Card;Card=7

Specific Problem: Card 7 has an alarm.

Description: Card Alarm

?

\*\*02 CICM500 0002 FLT CICM Fault



Location: 47.165.168.120

Notification Id: 5

State: Raised

Category: equipment

Cause: unspecifiedReason(118)

Time: Jun 17 09:02:08 2004

Component Id: CICM=CICM-120A;NodeType=Cicm;Component=Chassis

Specific Problem: Chassis card state change report for slot 7 in state

1

Description: Chassis Card State Change

?

**\*\*02 CICM339 0003 FLT CICM Fault**

Location: 47.165.168.120

Notification Id: 6

State: Raised

Category: equipment

Cause: IANError(25)

Time: Jun 17 09:02:13 2004

Component Id: CICM=CICM-120A;NodeType=Cicm

Specific Problem: Have not received a message from Node B for 1.5\*ALARM

\_POLL\_PERIOD Seconds. CPU\_CARD\_DOMAIN\_A

Description: No Message Received From B

### NTSTD

The following is an example of a CICM log in NTSTD format:

```
test * CICM359 JUN17 09:02:08 0004 FLT CICM Fault
      Location: 47.165.168.120
      Notification Id: 7
      State: Raised
      Category: equipment
      Cause: equipmentMalfunction(15)
      Time: Jun 17 09:02:08 2004
      Component Id: CICM=CICM-120A;NodeType=Cicm;Component=Card;Card=7
```

Specific Problem: Card 7 has an alarm.

Description: Card Alarm

```
test ** C1CM500 JUN17 09:02:08 0005 FLT C1CM Fault
Location: 47.165.168.120
Notification Id: 5
State: Raised
Category: equipment
Cause: unspecifiedReason(118)
Time: Jun 17 09:02:08 2004
Component Id: C1CM=C1CM-120A;NodeType=C1cm;Component=Chassis
Specific Problem: Chassis card state change report for slot 7 in state
1
Description: Chassis Card State Change
```

```
test ** C1CM339 JUN17 09:02:13 0006 FLT C1CM Fault
Location: 47.165.168.120
Notification Id: 6
State: Raised
Category: equipment
Cause: lANError(25)
Time: Jun 17 09:02:13 2004
Component Id: C1CM=C1CM-120A;NodeType=C1cm
Specific Problem: Have not received a message from Node B for 1.5*ALARM
_POLL_PERIOD Seconds. CPU_CARD_DOMAIN_A
Description: No Message Received From B
```

## SNMP

The following is an example of a C1CM log in SNMP format:

```
sysUpTime. => 19:40:37
snmpTrapOID. => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
20.50.48
.48.52.45.54.45.50.57.44.49.48.58.50.57.58.48.46.52.44.11925
alarmActiveDateAndTime => 2004-6-29,10:29:0.4
```

```
alarmActiveDescription => DeviceSpecificInfo=softwareProgramError(48);Backup
Fail.
nnExtAlarmActiveEventType => 4
nnExtAlarmActiveProbableCause => 1024
nnExtAlarmActiveAdditionalText => Scheduled/on-demand backup failed during
last iteration.
nnExtAlarmActiveDocumentationPointer => CICM341
nnExtAlarmActiveResourceDescription => IEMS=47.142.86.95-CICM-
Mgr_Card_A;CICM=CICMEM-000-A;NodeType=Platform
nnExtAlarmActiveSequenceNumber => 1
```

### Syslog

The following is an example of a CICM log in Syslog format:

```
Jun 29 10:40:34 2004      ComponentId: 47.165.168.74-CICM-Mgr_Card_B      Specific
Problem: Connection Lost      Description: IEMS Unable to communicate with managed device
Jun 29 10:50:40 2004      ComponentId: 47.165.168.120-CICM_Card_A      Description: IEMS
regained communication with the managed device
```

## Performance

### OM and PM Documentation references for CICM

- N10327-711 - IEMS Performance Management

### Northbound OM/PM Formats

Performance measurements for CICM are available only from the CICM Manager interface. See NN10327-711 - IEMS Performance Management for more information.

### XML

The following is an example of Performance data for CICM in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
  <FileCreationTime>2005-03-27T23:30:03EST</FileCreationTime>
- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="CICM">
  <EntityId>47.165.168.120</EntityId>
- <Table MeasurementKind="Snapshot" IntervalDuration="30">
```

```
<TableId>.iso.org.dod.internet.mgmt.mib-
2.rmon.usrHistory.usrHistoryControlTable.usrHistoryControlEntry</TableId>
  <CaptureTime>2005-03-27T23:30:00EST</CaptureTime>
- <Labels>
  <Label>usrHistoryControlIndex</Label>
  <Label>usrHistoryControlInterval</Label>
  <Label>usrHistoryControlOwner</Label>
  <Label>usrHistoryControlStatus</Label>
</Labels>
- <RowOfValues>
- <RowValue>
  <Value>5</Value>
</RowValue>
- <RowValue>
  <Value />
</RowValue>
- <RowValue>
  <Value>CICM-120A</Value>
</RowValue>
- <RowValue>
  <Value>1</Value>
</RowValue>
</RowOfValues>
</Table>
- <Table MeasurementKind="Snapshot" IntervalDuration="30">

<TableId>.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.
nortelPerfRefMIB.nnPerfMetricReferenceTable.nnPerfMetricReferenceEntry</TableId>
  <CaptureTime>2005-03-27T23:30:01EST</CaptureTime>
- <Labels>
  <Label>nnPerfMetricRefIndex</Label>
  <Label>nnPerfMetricName</Label>
  <Label>nnPerfMetricGroup</Label>
  <Label>nnPerfMetricDataType</Label>
  <Label>nnPerfMetricSources</Label>
  <Label>nnPerfMetricValue</Label>
```

```
</Labels>
- <RowOfValues>
- <RowValue>
  <Value>5</Value>
</RowValue>
- <RowValue>
  <Value>ActiveConnections</Value>
</RowValue>
- <RowValue>
  <Value>CICM</Value>
</RowValue>
- <RowValue>
  <Value>1</Value>
</RowValue>
- <RowValue>
  <Value>2</Value>
</RowValue>
- <RowValue>
  <Value>0</Value>
</RowValue>
</RowOfValues>
- <RowOfValues>
- <RowValue>
  <Value>4</Value>
</RowValue>
- <RowValue>
  <Value>PercentageCpuUsed</Value>
</RowValue>
- <RowValue>
  <Value>CICM</Value>
</RowValue>
- <RowValue>
  <Value>1</Value>
</RowValue>
- <RowValue>
  <Value>2</Value>
```

```
</RowValue>
- <RowValue>
  <Value>0</Value>
</RowValue>
</RowOfValues>
- <RowOfValues>
- <RowValue>
  <Value>3</Value>
</RowValue>
- <RowValue>
  <Value>PercentageMemoryUsed</Value>
</RowValue>
- <RowValue>
  <Value>CICM</Value>
</RowValue>
- <RowValue>
  <Value>1</Value>
</RowValue>
- <RowValue>
  <Value>2</Value>
</RowValue>
- <RowValue>
  <Value>0</Value>
</RowValue>
</RowOfValues>
- <RowOfValues>
- <RowValue>
  <Value>2</Value>
</RowValue>
- <RowValue>
  <Value>NumberOfLogs</Value>
</RowValue>
- <RowValue>
  <Value>CICM</Value>
</RowValue>
- <RowValue>
```

```
<Value>1</Value>
</RowValue>
- <RowValue>
  <Value>2</Value>
</RowValue>
- <RowValue>
  <Value>0</Value>
</RowValue>
</RowOfValues>
- <RowOfValues>
- <RowValue>
  <Value>1</Value>
</RowValue>
- <RowValue>
  <Value>ActiveSessions</Value>
</RowValue>
- <RowValue>
  <Value>CICM</Value>
</RowValue>
- <RowValue>
  <Value>1</Value>
</RowValue>
- <RowValue>
  <Value>2</Value>
</RowValue>
- <RowValue>
  <Value>2662732</Value>
</RowValue>
</RowOfValues>
</Table>
</Entity>
</System>
</PMFile>
```

## CSV

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime

PM,commonFormat.xsd,2005-03-27T23:30:03EST

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

47.165.168.120,CICM

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

.iso.org.dod.internet.mgmt.mib-

2.rmon.usrHistory.usrHistoryControlTable.usrHistoryControlEntry,Snapshot,30,  
2005-03-27T23:30:00EST

Label,Label,Label,Label

usrHistoryControlIndex,usrHistoryControlInterval,usrHistoryControlOwner,usrH  
istoryControlStatus

Value,Value,Value,Value

5,900,CICM-120A,1

Table=End

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nortelPer  
fRefMIB.nnPerfMetricReferenceTable.nnPerfMetricReferenceEntry,Snapshot,30,20  
05-03-27T23:30:01EST

Label,Label,Label,Label,Label,Label

nnPerfMetricRefIndex,nnPerfMetricName,nnPerfMetricGroup,nnPerfMetricDataType  
,nnPerfMetricSources,nnPerfMetricValue

Value,Value,Value,Value,Value,Value

5,ActiveConnections,CICM,1,2,0

4,PercentageCpuUsed,CICM,1,2,0



3,PercentageMemoryUsed,CICM,1,2,0

2,NumberOfLogs,CICM,1,2,0

1,ActiveSessions,CICM,1,2,2662732

Table=End

Entity=End

System=End

PMFile=End

## **GUI/CLUI Documentation for CICM**

### **GUI Launching and User procedures**

### **Related documents**

## **Ethernet Routing Switch 8600 (formerly Passport 8600)**

This section contains IEMS Northbound log samples and device documentation references for the the Ethernet Routing Switch, formerly Passport 8600.

### **Ethernet Routing Switch 8600 Fault Interface**

#### **Fault documentation for Ethernet Routing Switch 8600:**

- 241-6001-502 MDM Device Alarms Reference Guide
- 241-6003-110 - Ethernet Routing Switch 8600 Device Integration Cartridge User Guide

#### **Fault Mapping for Ethernet Routing Switch 8600**

The following criteria can be used for looking up information on specific faults for Ethernet Routing Switch 8600.

**Fault Correlation for Ethernet Routing Switch 8600**

| <b>NB format -&gt;</b>              | <b>SCC2</b>        | <b>NTSTD</b>       | <b>SNMP</b>        | <b>Syslog</b>      | <b>Document Reference</b>                                                           |
|-------------------------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------------------------------------------------------------|
| <b>Device/EM</b>                    |                    |                    |                    |                    |                                                                                     |
| <b>Ethernet Routing Switch 8600</b> | logname and number | logname and number | logname and number | logname and number | 241-6003-110 - Ethernet Routing Switch 8600 Device Integration Cartridge User Guide |

**Northbound Fault Formats for Ethernet Routing Switch 8600****SCC2**

The following is an example of a Ethernet Routing Switch 8600 log in SCC2 format:

```

**59 PP  330 0010 TBL  PP Fault
      Location: pp8600;47.142.106.1
      State: Raised
      Category: equipment
      Cause: Link Oscillation detected
      Time: Aug 09 15:59:14 2004
      Component ID: PP8600=47.142.106.1; portIndex=198
      Specific Problem: RC Link Oscillation
      Description: LinkOscillation: portIndex = 198
      .1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.4.1.2272.1.21.0.8
      .1.3.6.1.2.1.1.3.0: 50 days, 17 hours, 4 minutes, 39 seconds.

03 PP  318 0011 INFO PP Fault
      Location: pp8600;47.142.106.1
      State: Cleared
      Category: communications
      Cause: communication regained
      Time: Aug 09 16:03:38 2004
      Component ID: PP8600=47.142.106.1; ifIndex=89
      Specific Problem: Generic Link Status
      Description: Link Up: ifIndex = 89( AdminStatus = up OperationStatus = u
p)
      .1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.4.0
      .1.3.6.1.2.1.1.3.0: 50 days, 17 hours, 9 minutes, 3 seconds

```

## NTSTD

The following is an example of a Ethernet Routing Switch 8600 log in NTSTD format:

```
MY_OFFICE  **    PP330 AUG09 15:59:14 0010 TBL  PP Fault
Location: pp8600;47.142.106.1
State: Raised
Category: equipment
Cause: Link Oscillation detected
Time: Aug 09 15:59:14 2004
Component ID: PP8600=47.142.106.1; portIndex=198
Specific Problem: RC Link Oscillation
Description: LinkOscillation: portIndex = 198
.1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.4.1.2272.1.21.0.8
.1.3.6.1.2.1.1.3.0: 50 days, 17 hours, 4 minutes, 39 seconds.

MY_OFFICE      PP318 AUG09 16:03:38 0011 INFO PP Fault
Location: pp8600;47.142.106.1
State: Cleared
Category: communications
Cause: communication regained
Time: Aug 09 16:03:38 2004
Component ID: PP8600=47.142.106.1; ifIndex=89
Specific Problem: Generic Link Status
Description: Link Up: ifIndex = 89(AdminStatus = up OperationStatus = u
p)
.1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.4.0
.1.3.6.1.2.1.1.3.0: 50 days, 17 hours, 9 minutes, 3 seconds.
```

## SNMP

The following is an example of a Ethernet Routing Switch 8600 log in SNMP format:

```
sysUpTime.0 => 2:55:28
snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.19.50.48
.48.52.45.50.45.52.44.53.58.53.56.58.52.54.46.54.44.90024
```

```

alarmActiveDateAndTime => 2004-2-4,5:58:46.6
alarmActiveDescription => A link is down.
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => PP 398
nnExtAlarmActiveResourceDescription => IEMS=47.142.130.66-PP8600;3
nnExtAlarmActiveSequenceNumber => 2709

```

## Syslog

The following is an example of a Ethernet Routing Switch 8600 log in Syslog format:

```

Aug 9 15:58:57 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=3342~~ PP317 MAJOR TBL
PP Fault^M Location: pp8600;47.142.106.1^M State: Raised^M Category:
com
munications^M Cause: loss of communication^M Time: Aug 09 15:58:56 2004^M
Component ID: PP8600=47.142.106.1; ifIndex=89^M Specific Problem: Generic Li
nk Status^M Description: Link Down: ifIndex = 89( AdminStatus = down
OperationStatus^M = down)^M .1.3.6.1.6.3.1.1.4.1.0:
.1.3.6.1.6.3.1.1.5.3.0^M .1.
3.6.1.2.1.1.3.0: 50 days, 17 hours, 4 minutes, 22 seconds.

Aug 9 15:59:14 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=3343~~ PP318 NONE INFO
PP Fault^M Location: pp8600;47.142.106.1^M State: Cleared^M Category:
co
mmunications^M Cause: communication regained^M Time: Aug 09 15:59:14
2004^M Component ID: PP8600=47.142.106.1; ifIndex=198^M Specific Problem:
Generic
Link Status^M Description: Link Up: ifIndex = 198( AdminStatus = up
OperationStatus = ^M up)^M .1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.4.0^M
.1.3.
6.1.2.1.1.3.0: 50 days, 17 hours, 4 minutes, 39 seconds.

```

## Performance

### OM and PM Documentation references for Ethernet Routing Switch 8600

*Not available at time of publication*

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

## XML

The following is an example of Performance for Ethernet Routing Switch 8600 in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
_ <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM
```

```
<CaptureTime>2004-06-23T17:30:01EST</CaptureTime>
<MeasureId>snmpInTotalSetVars</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>15</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:30:02EST</CaptureTime>
<MeasureId>snmpInPkts</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>320467</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:30:03EST</CaptureTime>
<MeasureId>snmpInTotalReqVars</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>1412075</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:30:03EST</CaptureTime>
<MeasureId>snmpInASNParseErrs</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>2</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:30:03EST</CaptureTime>
<MeasureId>snmpInBadVersions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:30:04EST</CaptureTime>
```

```

<MeasureId>snmpInBadCommunityUses</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>

```

## CSV

The following is an example of Performance for Ethernet Routing Switch 8600 in CSV format:

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime  
PM,commonFormat.xsd,2005-04-29T16:03:27EST

System=Begin

SystemId  
NortelNetworks/IEMS

Entity=Begin

EntityId,Type  
47.142.106.1,ERS 8600

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime  
.iso.org.dod.internet.mgmt.mib-  
2.interfaces.ifTable.ifEntry,Snapshot,60,2005-04-29T16:03:25EST  
Label,Label,Label,Label,Label,Label,Label,Label  
ifIndex,ifInOctets,ifInDiscards,ifInErrors,ifOutOctets,ifOutDiscards,ifDescr  
,ifOutErrors  
Value,Value,Value,Value,Value,Value,Value,Value  
99,3519556990,,,2843839675,,10BaseTX Port 1/36 Name RTPU SDM,  
98,1892551806,,,2939876487,,10BaseTX Port 1/35 Name ,  
97,0,,,0,,10/100BaseTX Port 1/34 Name ,

96,2607035364,,,1156091781,,100BaseTX Port 1/33 Name RTPU EIOP,  
95,585000400,,,3333348300,,100BaseTX Port 1/32 Name ,  
94,0,,,0,,10/100BaseTX Port 1/31 Name ,  
93,0,,,0,,10/100BaseTX Port 1/30 Name ? on port status,  
92,0,,,0,,10/100BaseTX Port 1/29 Name ,  
91,0,,,0,,10/100BaseTX Port 1/28 Name ,  
90,692189368,,,1918881709,,100BaseTX Port 1/27 Name RTPU IEMS,  
139,0,,,0,,10/100BaseTX Port 2/12 Name ,  
138,0,,,0,,10/100BaseTX Port 2/11 Name ,  
137,0,,,0,,10/100BaseTX Port 2/10 Name ,  
136,0,,,0,,10/100BaseTX Port 2/9 Name ,  
135,0,,,0,,10/100BaseTX Port 2/8 Name ,  
134,0,,,0,,10/100BaseTX Port 2/7 Name ,  
199,742043178,,,2204480142,,1000GbicSx Port 3/8 Name RTPU-RTPH MLT Link 1,  
133,0,,,0,,10/100BaseTX Port 2/6 Name ,  
198,3024541849,,,147000570,,1000GbicSx Port 3/7 Name MG9K C410,  
132,0,,,0,,10/100BaseTX Port 2/5 Name ,  
197,3067630249,,,4072781420,,1000GbicSx Port 3/6 Name MG9K MG16,  
131,0,,,0,,10/100BaseTX Port 2/4 Name ,  
196,267713923,,,1565959639,,1000GbicSx Port 3/5 Name MG9K CO22,  
130,0,,,0,,10/100BaseTX Port 2/3 Name ,  
195,3664,,,192888860,,1000GbicSx Port 3/4 Name ,  
194,0,,,0,,1000GbicSx Port 3/3 Name MG9K HW3,  
193,2648170775,,,1114208656,,1000GbicSx Port 3/2 Name MG9K UD16,  
192,1881433572,,,3766840280,,1000GbicSx Port 3/1 Name RTPU IP IW SPM4 ,  
89,2393684118,,,1734992991,,100BaseTX Port 1/26 Name ,  
88,0,,,0,,10/100BaseTX Port 1/25 Name ,  
87,0,,,3921817024,,100BaseTX Port 1/24 Name ,  
86,244245726,,,4058571199,,100BaseTX Port 1/23 Name ,  
85,2400959711,,,2195841459,,100BaseTX Port 1/22 Name RTPU CS2M,  
84,1800636,,,25853284,,10/100BaseTX Port 1/21 Name ,  
83,317573162,,,91399040,,100BaseTX Port 1/20 Name Test Port,  
82,0,,,0,,10/100BaseTX Port 1/19 Name Test Port,  
81,2579864907,,,1099267363,,100BaseTX Port 1/18 Name RTPU GWC7 Unit 0,  
80,1316890489,,,2166234394,,100BaseTX Port 1/17 Name RTPU GWC7 Unit 1,  
129,0,,,0,,10/100BaseTX Port 2/2 Name ,



128,0,,,0,,10/100BaseTX Port 2/1 Name ,  
79,1357807862,,,1141374711,,100BaseTX Port 1/16 Name RTPU GWC6 Unit 0,  
78,3315302032,,,783265118,,100BaseTX Port 1/15 Name RTPU GWC6 Unit 1,  
77,2492825486,,,1466290424,,100BaseTX Port 1/14 Name RTPU GWC5 Unit 0,  
76,1474662523,,,2148003140,,100BaseTX Port 1/13 Name RTPU GWC5 Unit 1,  
75,3468717706,,,2408425514,,100BaseTX Port 1/12 Name RTPU GWC4 Unit 0,  
74,2223654205,,,2620590791,,100BaseTX Port 1/11 Name RTPU GWC4 Unit 1,  
73,4232774182,,,3276379595,,100BaseTX Port 1/10 Name RTPU GWC3 Unit 0,  
72,1979511439,,,2755663000,,100BaseTX Port 1/9 Name RTPU GWC3 Unit 1,  
71,2117328003,,,3779464870,,100BaseTX Port 1/8 Name RTPU GWC2 Unit 0,  
70,1411219792,,,3395507222,,100BaseTX Port 1/7 Name RTPU GWC2 Unit 1,  
111,890693112,,,454582540,,100BaseTX Port 1/48 Name To RTPU\_BS450 1 & 2,  
110,222680327,,,1712847940,,100BaseTX Port 1/47 Name Uplink to Cisco PIX and  
Corwan,  
175,0,,,0,,10/100BaseTX Port 2/48 Name ,  
174,0,,,0,,10/100BaseTX Port 2/47 Name ,  
173,0,,,0,,10/100BaseTX Port 2/46 Name ,  
172,0,,,0,,10/100BaseTX Port 2/45 Name ,  
171,0,,,0,,10/100BaseTX Port 2/44 Name ,  
170,0,,,0,,10/100BaseTX Port 2/43 Name ,  
69,2523957761,,,978312068,,100BaseTX Port 1/6 Name RTPU GWC1 Unit 0,  
68,1230452356,,,2093299274,,100BaseTX Port 1/5 Name RTPU GWC1 Unit 1,  
67,2004590554,,,1447660543,,100BaseTX Port 1/4 Name RTPU GWC0 Unit 0,  
66,1822773443,,,1710305771,,100BaseTX Port 1/3 Name RTPU GWC0 Unit 1,  
65,2337429088,,,1861141968,,100BaseTX Port 1/2 Name RTPU GWC SC Unit 1,  
64,3169371581,,,2444974653,,100BaseTX Port 1/1 Name RTPU GWC SC Unit 0,  
109,0,,,0,,10/100BaseTX Port 1/46 Name ,  
108,1749105803,,,4259656198,,10BaseTX Port 1/45 Name RTPU\_MG9KEM,  
107,1044800,,,96018816,,10BaseTX Port 1/44 Name Backbone B,  
106,3920056,,,1105156687,,100BaseTX Port 1/43 Name Backbone A,  
105,0,,,0,,10/100BaseTX Port 1/42 Name ,  
263,4070227425,,,1056151913,,1000GbicSx Port 4/8 Name RTPU-RTPH MLT Link 2,  
104,0,,,0,,10/100BaseTX Port 1/41 Name ,  
169,0,,,0,,10/100BaseTX Port 2/42 Name ,  
262,0,,,0,,1000Gbic Port 4/7 Name ,  
168,0,,,0,,10/100BaseTX Port 2/41 Name ,

103,0,,,0,,10/100BaseTX Port 1/40 Name ,  
261,0,,,0,,1000Gbic Port 4/6 Name ,  
102,0,,,0,,10/100BaseTX Port 1/39 Name ,  
167,0,,,0,,10/100BaseTX Port 2/40 Name ,  
260,0,,,0,,1000Gbic Port 4/5 Name ,  
101,0,,,0,,10/100BaseTX Port 1/38 Name ,  
166,0,,,0,,10/100BaseTX Port 2/39 Name ,  
100,0,,,0,,10/100BaseTX Port 1/37 Name ,  
165,0,,,0,,10/100BaseTX Port 2/38 Name ,  
164,0,,,0,,10/100BaseTX Port 2/37 Name ,  
163,0,,,0,,10/100BaseTX Port 2/36 Name ,  
162,0,,,0,,10/100BaseTX Port 2/35 Name ,  
161,0,,,0,,10/100BaseTX Port 2/34 Name ,  
160,0,,,0,,10/100BaseTX Port 2/33 Name ,  
259,0,,,0,,1000Gbic Port 4/4 Name ,  
258,0,,,0,,1000Gbic Port 4/3 Name ,  
257,0,,,0,,1000GbicSx Port 4/2 Name MG9K CO24,  
256,1976538350,,,3582672036,,1000GbicSx Port 4/1 Name RTPU IP IW SPM4,  
159,953365301,,,1219438157,,100BaseTX Port 2/32 Name ,  
158,244956300,,,2666151542,,100BaseTX Port 2/31 Name ,  
157,448168415,,,2799200531,,100BaseTX Port 2/30 Name ,  
156,451154192,,,2893074267,,100BaseTX Port 2/29 Name ,  
155,148226724,,,2572168254,,100BaseTX Port 2/28 Name ,  
154,1032287162,,,1263107257,,100BaseTX Port 2/27 Name ,  
153,0,,,0,,10/100BaseTX Port 2/26 Name ,  
152,0,,,0,,10/100BaseTX Port 2/25 Name ,  
151,0,,,0,,10/100BaseTX Port 2/24 Name ,  
150,0,,,0,,10/100BaseTX Port 2/23 Name ,  
149,0,,,0,,10/100BaseTX Port 2/22 Name ,  
148,0,,,0,,10/100BaseTX Port 2/21 Name ,  
147,0,,,0,,10/100BaseTX Port 2/20 Name ,  
146,0,,,0,,10/100BaseTX Port 2/19 Name ,  
145,0,,,0,,10/100BaseTX Port 2/18 Name ,  
144,0,,,0,,10/100BaseTX Port 2/17 Name ,  
143,0,,,0,,10/100BaseTX Port 2/16 Name ,  
142,0,,,0,,10/100BaseTX Port 2/15 Name ,

```
141,0,,,0,,10/100BaseTX Port 2/14 Name ,
140,0,,,0,,10/100BaseTX Port 2/13 Name ,
Table=End

SingleValues=Begin
MeasurementKind,IntervalDuration
Snapshot,60
MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability
ipOutRequests,2005-04-29T16:03:26EST,.iso.org.dod.internet.mgmt.mib-
2.ip,51086849,Valid
ipInReceives,2005-04-29T16:03:26EST,.iso.org.dod.internet.mgmt.mib-
2.ip,474055521,Valid
SingleValues=End

Entity=End

System=End

PMFile=End
```

## **GUI/CLUI Documentation for Ethernet Routing Switch 8600**

### **GUI Launching and User procedures**

- 316341-B Rev 00 - Installing and Using Device Manager
- 314723-B - Configuring Network Management

### **Related documentation**

- 314724-B - Configuring and Managing Security
- 314997-B - Read Me for Security
- 316341-A - Installing and Using Device Manager
- 313189-C - Getting Started
- 315545-B - Managing Platform Operations and Using Diagnostics Tools
- 314723-B - Configuring Network Management
- 314721-B - Configuring BGP Services
- 316433-B - Configuring QoS and IP Filtering

- 314720-C - Configuring IP Routing Operations
- 314725-B - Configuring Layer 2 Operations: “VLANs,” Spanning “Tree,” Multilink Trunking
- 314719-B - Configuring IP Multicast Routing Protocols
- 316343-A - Configuring IGMP for User Authentication (IGAP)
- 314722-A - Configuring IPX Routing Operations
- 314995-A - Configuring the Web Switching Module with Device Manager
- 316350-A - Using the SSL acceleration module with the Web switching module for the 8600 Series switch
- 315015-B - System Messaging Platform Reference Guide
- 315023-B - Using the Packet Capture Tool

## Gateway Controller (GWC)

This section contains IEMS Northbound log samples and device documentation references for the GWC.

### GWC Fault Interface

#### Fault documentation for GWC:

- NN10090-911 - GWC Fault Management

#### Fault Mapping for GWC

The following criteria can be used for looking up information on specific faults for GWC.

#### Fault Correlation for GWC

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                  |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------------------|
| GWC                       | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10090-911<br>GWC Fault<br>Management |

## Northbound Fault Formats for GWC

### SCC2

The following is an example of a GWC log in SCC2 format:

```
**14 GWC 307 7250 TBL GWC Fault
Location: GWC-2-UNIT-0
NotificationID: 4
State: Raise
Category: Communications
Cause: Communications subsystem failure
Time: Jan 23 15:15:59 2004
Component Id: GWC=GWC-2-UNIT-0;Version=PGC92BA;Unit=unit_0;Software=NODE
MTC
Specific Problem: EM not responding, provisioned data loaded from local
Flash
Description: Element Manager communication failure.
```

### NTSTD

The following is an example of a GWC log in NTSTD format:

```
COMPACT06BT ** GWC307 Jan23 20:14:38 7250 TBL GWC Fault
Location: GWC-2-UNIT-0
NotificationID: 4
State: Raise
Category: Communications
Cause: Communications subsystem failure
Time: Jan 23 15:15:59 2004
Component Id: GWC=GWC-2-UNIT-0;Version=PGC92BA;Unit=unit_0;Software=NODE
MTC
Specific Problem: EM not responding, provisioned data loaded from local
Flash
Description: Element Manager communication failure.
```

### SNMP

The following is an example of a GWC log in SNMP format:

```
system.sysUpTime.0 => 23:10:15
```

```

snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
20.50.48
.48.52.45.49.45.50.51.44.51.58.49.52.58.51.56.46.48.44.42848
alarmActiveDateAndTime => 2004-1-23,3:14:38.0,
alarmActiveDescription => Communication with a gateway is down.
nnExtAlarmActiveEventType => 2
nnExtAlarmActiveProbableCause => 554
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => GWC304
nnExtAlarmActiveResourceDescription => IEMS=0x00000063000000a1ac101127-GWC-
19-UNIT-1;GWC=GWC-19-UNIT-1;Version=GN090CD;Unit=unit_1;Software=SSC
nnExtAlarmActiveManualClear => 0
nnExtAlarmActiveSequenceNumber => 9028

```

## Syslog

The following is an example of a GWC log in Syslog format:

```

Feb 23 15:15:56 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=7307~~ GWC307 MAJOR TBL
GWC Fault^M      Location: GWC-2-UNIT-0^M      NotificationID: 4^M      State:
Raise^M          Category: Communications^M      Cause: Communications subsystem
failure^M         Time: Jan 23 15:15:59 2004^M      Component Id: GWC=GWC-2-UNIT-
0;Version=PGC92BA;Unit=unit_0;Software=NODE^M      MTC^M      Specific Problem: EM
not responding, provisioned data loaded from local^M      Flash^M      Description:
Element Manager communication failure.^M

```

## Performance

### OM and PM Documentation references for GWC

- NN10156-711 - GWC Performance Management

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

## XML

The following is an example of performance data for GWC in XML format:

```

<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">

```

```
<FileCreationTime>2005-02-04T14:30:30EST</FileCreationTime>
- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="GWC">
  <EntityId>172.17.40.52</EntityId>
- <SingleValues MeasurementKind="Snapshot" IntervalDuration="30">

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.legacyCallServer.lcsGateWayController.dptMeasurements</MeasureS
uppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-04T14:30:01EST</CaptureTime>
  <MeasureId>norUnitActivity</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.legacyCallServer.lcsGateWayController.gwcUnitStatusMIB.gwcUnitO
bjects.gwcUnitStatus</MeasureSuppId1>
  <Value>1</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-04T14:30:01EST</CaptureTime>
  <MeasureId>norUnitAdminStatus</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.legacyCallServer.lcsGateWayController.gwcUnitStatusMIB.gwcUnitO
bjects.gwcUnitStatus</MeasureSuppId1>
  <Value>1</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-04T14:30:01EST</CaptureTime>
  <MeasureId>norUnitOperStatus</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.legacyCallServer.lcsGateWayController.apgMeasurements</MeasureS
uppId1>
```

```

    <Value>0</Value>
    <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
    <CaptureTime>2005-02-04T14:30:03EST</CaptureTime>
    <MeasureId>dptCallAttempts</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.legacyCallServer.lcsGateWayController.dptMeasurements</MeasureS
uppId1>
    <Value>0</Value>
    <Reliability>Valid</Reliability>
  </SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>

```

## CSV

The following is an example of performance data for GWC in CSV format:

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime

PM,commonFormat.xsd,2005-02-04T14:30:30EST

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

172.17.40.52,GWC

SingleValues=Begin

MeasurementKind,IntervalDuration

Snapshot,30

MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability

norUnitActivity,2005-02-

04T14:30:01EST,.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser



```
viceControl.legacyCallServer.lcsGateWayController.gwcUnitStatusMIB.gwcUnitOb  
jects.gwcUnitStatus,1,Valid
```

```
norUnitAdminStatus,2005-02-  
04T14:30:01EST,.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser  
viceControl.legacyCallServer.lcsGateWayController.gwcUnitStatusMIB.gwcUnitOb  
jects.gwcUnitStatus,1,Valid
```

```
norUnitOperStatus,2005-02-  
04T14:30:01EST,.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser  
viceControl.legacyCallServer.lcsGateWayController.gwcUnitStatusMIB.gwcUnitOb  
jects.gwcUnitStatus,1,Valid
```

```
dptCallAttempts,2005-02-  
04T14:30:03EST,.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser  
viceControl.legacyCallServer.lcsGateWayController.dptMeasurements,0,Valid
```

```
SingleValues=End
```

```
Entity=End
```

```
System=End
```

```
PMFile=End
```

## **GUI/CLUI Documentation for GWC**

### **GUI Launching and User procedures**

- NN10026-111 - GWC Basics
- NN10112-511 - GWC Configuration Management
- NN10178-611 - GWC Security and Administration

### **Related documents**

## Integrated EMS (IEMS)

### IEMS Fault Interface

This section will provide references to customer documentation for Fault, Performance, Topology, GUI/CLUI, and Security for the IEMS managed object.

#### Fault documentation for IEMS:

- NN10275-909v3: Succession Fault Management Logs Reference Vol. 3
- NN10334-911: Integrated EMS Fault Management

#### Fault Mapping for IEMS

The following criteria can be used for looking up information on specific faults for IEMS.

**Table 1 Fault Correlation for IEMS**

| NB format -> | SCC2                                                     | NTStd                                                    | SNMP                                                     | Syslog                                                   | Document Reference |
|--------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|--------------------|
| Device/EM    |                                                          |                                                          |                                                          |                                                          |                    |
| <b>IEMS</b>  | Log name and log number<br>(Log Names: EMSS, IEMS, EMJS) | Log name and log number<br>(Log Names: EMSS, IEMS, EMJS) | Log name and log number<br>(Log Names: EMSS, IEMS, EMJS) | Log name and log number<br>(Log Names: EMSS, IEMS, EMJS) | NN10275-909v3      |

### Northbound Fault Formats for IEMS

#### SCC2

The following is an example of a IEMS log in SCC2 format:

##### Sample Raise:

```
*C55 IEMS398 0006 FLT Communication Lost
Location: 47.142.94.68
NotificationID: 0
State: Raised
Category: Communications
Cause: Communications subsystem failure
Time: Dec 13 13:55:15 2004
ComponentId: znc0s0jh-SSPFS-Unit-0
Specific Problem: Connection Lost
Description: IEMS Unable to communicate with managed device
```

##### Sample Clear:

**55 IEMS399 0007 FLT Communication Regained**

Location: 47.142.94.68

NotificationID: 0

State: Cleared

Category: Communications

Time: Dec 13 13:55:22 2004

ComponentId: znc0s0jh-SSPFS-Unit-0

Description: IEMS regained communication with the managed device

**NTStd**

The following is an example of a IEMS log in NTStd format:

**Sample Raise:**

office\_name \*\*\* IEMS398 DEC13 13:55:15 0006 FLT Communication Lost

Location: 47.142.94.68

NotificationID: 0

State: Raised

Category: Communications

Cause: Communications subsystem failure

Time: Dec 13 13:55:15 2004

ComponentId: znc0s0jh-SSPFS-Unit-0

Specific Problem: Connection Lost

Description: IEMS Unable to communicate with managed device

**Sample Clear:**

office\_name IEMS399 DEC13 13:55:22 0007 FLT Communication Regained

Location: 47.142.94.68

NotificationID: 0

State: Cleared

Category: Communications

Time: Dec 13 13:55:22 2004

ComponentId: znc0s0jh-SSPFS-Unit-0

Description: IEMS regained communication with the managed device

**SNMP**

The following is an example of a IEMS log in SNMP format:

**Sample Raise:**

system.sysUpTime.0 =&gt; 7:01:55

snmpTrapOID.0 =&gt; nnExtAlarmMajor

alarmActiveResourceId =&gt;

.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.19.50.48  
.48.52.45.49.50.45.49.51.44.50.58.52.58.56.46.51.44.649

alarmActiveDateAndTime =&gt; 2004-12-13,2:4:8.3,

alarmActiveDescription =&gt; IEMS Unable to communicate with managed device

nnExtAlarmActiveEventType =&gt; 1

nnExtAlarmActiveProbableCause =&gt; 6

```

nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => IEMS398
nnExtAlarmActiveResourceDescription => IEMS=IEMS-Mgr;znc0s0jh-SSPFS-Unit-0
nnExtAlarmActiveManualClear => 2
nnExtAlarmActiveSequenceNumber => 7

```

### Sample Clear:

```

system.sysUpTime.0 => 7:01:55
snmpTrapOID.0 => nnExtAlarmClear
alarmActiveResourceId =>
.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48.48.52.45.49.50.45.49.51.44.50.58.52.5
8.50.50.46.48.44.649
alarmActiveDateAndTime => 2004-12-13,2:4:22.0,
alarmActiveDescription => IEMS regained communication with the managed device
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => IEMS399
nnExtAlarmActiveResourceDescription => IEMS=IEMS-Mgr;znc0s0jh-SSPFS-Unit-0
nnExtAlarmActiveSequenceNumber => 8

```

### Syslog

The following is an example of a IEMS log in Syslog format:

#### Sample Raise:

```

Dec 13 13:55:15 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=4093~~ IEMS398 CRIT
FLT Communication Lost^M Location: 47.142.94.68^M NotificationID: 0^M State:
Raised^M Category: Communications^M Cause: Communications subsystem failure^M
Time: Dec 13 13:55:15 2004^M ComponentId: znc0s0jh-SSPFS-Unit-0^M Specific
Problem: Connection Lost^M Description: IEMS Unable to communicate with managed
device

```

#### Sample Clear:

```

Dec 13 13:55:22 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=4094~~ IEMS399
NONE FLT Communication Regained^M Location: 47.142.94.68^M NotificationID:
0^M State: Cleared^M Category: Communications^M Time: Dec 13 13:55:22
2004^M ComponentId: znc0s0jh-SSPFS-Unit-0^M Description: IEMS regained
communication with the managed device

```

## Performance

### OM and PM Documentation references for IEMS

•

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

## CSV

The following is an example of Performance data for IEMS in CSV format:

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime

PM,commonFormat.xsd,2005-03-17T13:00:02EST

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

47.142.128.115,IEMS

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

fiveMinCollectionJobTable,Snapshot,5,2005-03-17T13:00:02EST

Label,Label,Label,Label

fiveMinCollectionJobID,fiveMinCollectionJobName,fiveMinCollectionJobStartTime,fiveMinCollectionJobExecutionTime

Value,Value,Value,Value

1,IEMS5minCollection,1111082100898,2233

Table=End

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

tableSpaceTable,Snapshot,5,2005-03-17T13:00:01EST

Label,Label,Label

tableSpaceName,usedTableSpaceInBytes,usedTableSpaceInPercent

Value,Value,Value

IEMS\_TS,45875200,44

IEMS\_EVENT\_TS,134610944,16

IEMS\_PERF\_TS,13238272,2

Table=End

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

fiveMinTransferJobTable, Snapshot, 5, 2005-03-17T13:00:02EST

Label, Label, Label, Label

fiveMinTransferJobID, fiveMinTransferJobName, fiveMinTransferJobStartTime, fiveMinTransferJobExecutionTime

Value, Value, Value, Value

1, IEMS5minTransfer, 1111082103882, 453

Table=End

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

deviceEventRateTable, Snapshot, 5, 2005-03-17T13:00:01EST

Label, Label, Label, Label

deviceID, deviceName, eventRate, eventRateDetails

Value, Value, Value, Value

3, rtpo-mg9kem.us.nortel.com-MG9K-Mgr\_7.0, 0, 106 events received in 298170 milliseconds.

2, wnc0s0pe.us.nortel.com-MG9K-Mgr\_9.0, 0, 14 events received in 298170 milliseconds.

1, SYSLOG, 0, 6 events received in 298170 milliseconds.

Table=End

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

fiveMinReportJobTable, Snapshot, 5, 2005-03-17T13:00:02EST

Label, Label, Label, Label

fiveMinReportJobID, fiveMinReportJobName, fiveMinReportJobStartTime, fiveMinReportJobExecutionTime

Value, Value, Value, Value

1, IEMS5minReport, 1111082100898, 733

Table=End

SingleValues=Begin

MeasurementKind, IntervalDuration

Snapshot, 5

MeasureId, CaptureTime, MeasureSuppId1, Value, Reliability

```
systemRestartCount,2005-03-
17T13:00:00EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.system,2,
Valid

numOfActiveClients,2005-03-
17T13:00:00EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.client,6,
Valid

numOfEventsFromUnknownCustlogDevices,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,6,Valid

eventQueueSize,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,0,Valid

numOfEventsFromUnknownSNMPDevices,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,0,Valid

avgEventThroughputRate,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,0,Valid

numOfEventsFromUnknownDevices,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,6,Valid

maxEventThroughputRate,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,2,Valid

numOfDiscardedEvents,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,0,Valid

numOfEvents,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,150735,Valid

numOfEventsAdded,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.eve
nt,137,Valid

numOfAlarmsCleared,2005-03-
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala
rms,73,Valid
```

numOfMajorAlarms, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala  
rms, 263, Valid

numOfWarningAlarms, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala  
rms, 75, Valid

numOfCriticalAlarms, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala  
rms, 36, Valid

numOfAlarmsAdded, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala  
rms, 47, Valid

numOfMinorAlarms, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala  
rms, 74, Valid

numOfActiveAlarms, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ala  
rms, 448, Valid

numOfDBCcleanUpPolicyExecutions, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.database,  
1, Valid

applicationHeapSize, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.memory, 10  
1923064, Valid

maxApplicationHeapSize, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.memory, 13  
9169296, Valid

numOfAttributesCollected, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce, 19411, Valid

numOfReportsJobsProvisioned, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce, 0, Valid

numOfTransferJobsProvisioned, 2005-03-  
17T13:00:01EST, .iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce, 0, Valid



numOfCollectionJobsProvisioned,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce,0,Valid

numOfAttributesCollectedOverThisInterval,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce,176,Valid

numOfFailedReportJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce,0,Valid

numOf24HrSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.successfulCollectionJobs,0,Valid

numOf30MinSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.successfulCollectionJobs,0,Valid

numOf12HrSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.successfulCollectionJobs,0,Valid

numOf15MinSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.successfulCollectionJobs,0,Valid

numOf60MinSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.successfulCollectionJobs,0,Valid

numOf5MinSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.successfulCollectionJobs,1,Valid

numOf15MinPartialSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.partialSuccessfulCollectionJobs,0,Valid

numOf60MinPartialSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.partialSuccessfulCollectionJobs,0,Valid

numOf5MinPartialSuccessfulJobs,2005-03-  
17T13:00:01EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.partialSuccessfulCollectionJobs,0,Valid

numOf24HrPartialSuccessfulJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.partialSuccessfulCollectionJobs,0,Valid

numOf30MinPartialSuccessfulJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.partialSuccessfulCollectionJobs,0,Valid

numOf12HrPartialSuccessfulJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.partialSuccessfulCollectionJobs,0,Valid

numOf24HrFailedCollectionJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedCollectionJobs,0,Valid

numOf30MinFailedCollectionJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedCollectionJobs,0,Valid

numOf12HrFailedCollectionJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedCollectionJobs,0,Valid

numOf15MinFailedCollectionJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedCollectionJobs,0,Valid

numOf60MinFailedCollectionJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedCollectionJobs,0,Valid

numOf5MinFailedCollectionJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedCollectionJobs,0,Valid

numOf24HrFailedTransferJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedTransferJobs,0,Valid

numOf30MinFailedTransferJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedTransferJobs,0,Valid

numOf12HrFailedTransferJobs,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan  
ce.failedTransferJobs,0,Valid

```
numOf15MinFailedTransferJobs,2005-03-
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cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan
ce.failedTransferJobs,0,Valid

numOf60MinFailedTransferJobs,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan
ce.failedTransferJobs,0,Valid

numOf5MinFailedTransferJobs,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.performan
ce.failedTransferJobs,0,Valid

numOfManagedObjects,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
345,Valid

numOfDevicesInUnManagedState,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
4,Valid

numOfAddedManagedObjects,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
0,Valid

numOfDevicesInUnKnownState,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
9,Valid

numOfUnKnownDeviceStateTransistions,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
0,Valid

numOfdeletedManagedObjects,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
0,Valid

numOfThrottledDeviceStateTransistions,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
0,Valid

numOfDevicesInThrottledState,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
0,Valid

numOfSystemUnManagedDeviceStateTransistions,2005-03-
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,
0,Valid
```

```
numOfDevicesInSystemUnManagedState,2005-03-  
17T13:00:02EST,.iso.org.dod.internet.private.enterprises.nortel.nortelGeneri  
cMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.topology,  
0,Valid
```

```
SingleValues=End
```

```
Entity=End
```

```
System=End
```

```
PMFile=End
```

## XML

The following is an example of Performance data for IEMS in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>  
<PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"  
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">  
<FileCreationTime>2004-12-13T13:06:04EST</FileCreationTime>  
<System>  
<SystemId>NortelNetworks/IEMS</SystemId>  
<Entity Type="IEMS">  
<EntityId>47.142.94.68</EntityId>  
<Table MeasurementKind="Snapshot" IntervalDuration="30">  
<TableId>fiveMinCollectionJobTable</TableId>  
<CaptureTime>2004-12-13T13:05:54EST</CaptureTime>  
<Labels>  
<Label>fiveMinCollectionJobID</Label>  
<Label>fiveMinCollectionJobName</Label>  
<Label>fiveMinCollectionJobStartTime</Label>  
<Label>fiveMinCollectionJobExecutionTime</Label>  
</Labels>  
<RowOfValues>  
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<Value>1</Value>
```

```
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<Value>storm_collect</Value>
</RowValue>
<RowValue>
<Value>1102961130856</Value>
</RowValue>
<RowValue>
<Value>4586</Value>
</RowValue>
</RowOfValues>
</Table>
<Table MeasurementKind="Snapshot" IntervalDuration="30">
<TableId>thirtyMinCollectionJobTable</TableId>
<CaptureTime>2004-12-13T13:05:54EST</CaptureTime>
<Labels>
<Label>thirtyMinCollectionJobID</Label>
<Label>thirtyMinCollectionJobName</Label>
<Label>thirtyMinCollectionJobStartTime</Label>
<Label>thirtyMinCollectionJobExecutionTime</Label>
</Labels>
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</RowValue>
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<Value>1102961120556</Value>
</RowValue>
<RowValue>
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</RowValue>
</RowOfValues>
</Table>
```

```
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<Label>usedTableSpaceInPercent</Label>
</Labels>
<RowOfValues>
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<RowValue>
<Value>IEMS_EVENT_TS</Value>
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<RowValue>
<Value>5963776</Value>
</RowValue>
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</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>IEMS_PERF_TS</Value>
</RowValue>
<RowValue>
<Value>1835008</Value>
```

```
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
</Table>
<SingleValues MeasurementKind="Snapshot" IntervalDuration="30">
<SingleValue>
<CaptureTime>2004-12-13T13:05:50EST</CaptureTime>
<MeasureId>systemRestartCount</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.nortelGener
icMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.system</
MeasureSuppId1>
<Value>3</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-13T13:05:50EST</CaptureTime>
<MeasureId>numOfActiveClients</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.nortelGener
icMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.client</
MeasureSuppId1>
<Value>3</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-13T13:05:50EST</CaptureTime>
<MeasureId>numOfEventsFromUnknownCustlogDevices</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.nortelGener
icMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ev
ent</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-13T13:05:50EST</CaptureTime>
<MeasureId>eventQueueSize</MeasureId>
```

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<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.nortelGener  
icMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ev  
ent</MeasureSuppId1>  
<Value>0</Value>  
<Reliability>Valid</Reliability>  
</SingleValue>  
<SingleValue>  
<CaptureTime>2004-12-13T13:05:50EST</CaptureTime>  
<MeasureId>numOfEventsFromUnknownSNMPDevices</MeasureId>  
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.nortelGener  
icMIBs.nortelNetworkManagementInterfaceMIBs.operationalMeasurements.fault.ev  
ent</MeasureSuppId1>  
<Value>0</Value>  
<Reliability>Valid</Reliability>  
</SingleValue>  
<SingleValue>  
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## **GUI/CLUI Documentation for IEMS**

### **GUI Launching and User procedures**

- NN10329-111: Integrated EMS Basics

#### **Related documents**

- NN10334-911: Integrated EMS Fault Management
- NN10330-511: Integrated EMS Configuration Management
- NN10327-711: Integrated EMS Performance Management
- NN10336-611: Integrated EMS Security and Administration

## **Media Application Server (MAS)**

### **MAS Fault Interface**

This section will provide references to customer documentation for Fault, Performance, Topology, GUI/CLUI, and Security for MAS.

#### **Fault documentation for MAS:**

- NN10303-111 - MCP 2.0 MAS Meetme Basics
- NN10297-111 - MCP 2.0 MAS Adhoc Basics

#### **Fault Mapping for MAS**

The following criteria can be used for looking up information on specific faults for MAS.

**Fault Correlation for MAS**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>                               | <b>NTSTD</b>                              | <b>SNMP</b>                               | <b>Syslog</b>                             | <b>Document Reference</b>                                                                        |
|--------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------|
| <b>MAS</b>                           | Event Id<br><br>Logname and<br>Log number | Event Id<br><br>Logname and<br>Log number | Event Id<br><br>Logname and<br>Log number | Event Id<br><br>Logname and<br>Log number | NN10303-111<br>MCP 2.0 MAS<br>Meetme<br>Basics<br><br>NN10297-111<br>MCP 2.0 MAS<br>Adhoc Basics |

**Northbound Fault Formats for MAS****SCC2**

The following is an example of a MAS log in SCC2 format:

```
*C00 MAS 330 2515 FLT Fault
Location: 47.104.11.120
Notification Id: 1001
State: Raised
Category: processingError
Cause: applicationSubsystemFailure
Time: Mar 23 10:46:51 2004
Component Id: MediaServer_CStore
Specific Problem: MAS;330
Description: Component Shutdown
```

**NTSTD**

The following is an example of a MAS log in NTSTD format:

```
RTPU07CAPT *** MAS330 MAR23 17:00:18 2310 FLT Fault
Location: 47.104.11.120
Notification Id: 1001
State: Raised
Category: processingError
Cause: applicationSubsystemFailure
Time: Mar 23 10:46:51 2004
Component Id: MediaServer_CStore
Specific Problem: MAS;330
Description: Component Shutdown
```

## SNMP

The following is an example of a MAS log in SNMP format:

```
sysUpTime.0 => 1:52:16
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.19.50.48
.48.52.45.51.45.50.51.44.48.58.48.58.49.56.46.54.44.
2572
alarmActiveDateAndTime => 2004-3-23,0:0:18.6
alarmActiveDescription => Component Shutdown
nnExtAlarmActiveEventType => 3
nnExtAlarmActiveProbableCause => 2
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => MAS330
nnExtAlarmActiveResourceDescription => IEMS=47.104.11.120-MAS;MediaServer_CStore
nnExtAlarmActiveManualClear => 1
```

## Syslog

The following is an example of a MAS log in Syslog format:

```
Mar 23 12:00:19 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=3629~~ MAS330 CRIT FLT
Fault^M      Location: 47.104.11.120^M      Notification Id: 1001^M      State:
Raised^M      Category: processingError^M Cause: applicationSubsystemFailure^M
Time: Mar 23 10:46:51 2004^M      Component Id: MediaServer_CStore^M      Specific
Problem: MAS;330^M      Description: Component Shutdown
```

## Performance

### OM and PM Documentation references for MAS

- NN10303-111 - MCP 2.0 MAS Meetme Basics
- NN10297-111 - MCP 2.0 MAS Adhoc Basics

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

## XML

The following is an example of Performance data for MAS in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
```

```
<FileCreationTime>2004-04-12T23:30:57GMT+05:30</FileCreationTime>
- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="MAS">
  <EntityId>192.168.110.136</EntityId>
- <SingleValues MeasurementKind="Snapshot" IntervalDuration="15">
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>ActiveConferenceParties</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>ActiveConferences</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>ActiveServices</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>ActiveSessions</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
```



```
<CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
<MeasureId>AllocatedSessions</MeasureId>
<MeasureSuppId1>MediaController</MeasureSuppId1>
<Value>1</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>AvailableServices</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFAddPartyRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFCreateConferenceRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFDeleteConferenceRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
```

```
<MeasureId>CFGlobalMFConferencePortRequests</MeasureId>
<MeasureSuppId1>MediaController</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFMessagesReceived</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>1</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFMessagesSent</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>1</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFModifyPartyRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFPartyMFConferencePortRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CFRemovePartyRequests</MeasureId>
```

```
<MeasureSuppId1>MediaController</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:19:08GMT+05:30</CaptureTime>
  <MeasureId>CSAdminRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
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  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CSDeliverRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CSIngestRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CSMessagesReceived</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>1</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>CSMessagesSent</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
```

```
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- <SingleValue>
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  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  <MeasureId>CSQueryRequests</MeasureId>
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  <MeasureSuppId1>MediaController</MeasureSuppId1>
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- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
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  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>InstantMessageResponsesReceived</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
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```

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- <SingleValue>
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- <SingleValue>
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  <Reliability>Valid</Reliability>
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- <SingleValue>
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```

```
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- <SingleValue>  
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```
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  <MeasureId>OriginatingAcks</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  </SingleValue>
- <SingleValue>
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  <MeasureId>OriginatingByes</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  <Reliability>Valid</Reliability>
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- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>OriginatingInvites</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>OriginatingNotifies</MeasureId>
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  <Value>0</Value>
  <Reliability>Valid</Reliability>
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  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
```



```
<MeasureId>OriginatingRefers</MeasureId>
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<Value>0</Value>
<Reliability>Valid</Reliability>
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  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>OriginatingStatus200</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>OriginationStatus400</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>RegisterRequest</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
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- <SingleValue>
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  <MeasureId>SignaledDigit</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
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- <SingleValue>
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  <MeasureId>TerminatingAcks</MeasureId>
```

```
<MeasureSuppId1>MediaController</MeasureSuppId1>
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<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
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  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  <Reliability>Valid</Reliability>
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  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  <Reliability>Valid</Reliability>
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- <SingleValue>
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  <MeasureId>TerminatingRefers</MeasureId>
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  <MeasureSuppId1>MediaController</MeasureSuppId1>
```

```
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<Reliability>Valid</Reliability>
</SingleValue>
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  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlCStoreRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
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  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlDocumentStarted</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlDocumentStopped</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlIvrMPAdjustRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlIvrMPAsrRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
```

```

    <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlIvrMPCollectRequests</MeasureId>
  <MeasureSuppId1>MediaController</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability> </DIV>

```

The XML page cannot be displayed

Cannot view XML input using XSL style sheet. Please correct the error and then click the Refresh button, or try again later.

End tag 'SingleValues' does not match the start tag 'SingleValue'. Error processing resource 'file:///D:/Profiles/yuenglin/...

```

</SingleValues>
--^
>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2004-04-12T23:18:53GMT+05:30</CaptureTime>
  <MeasureId>VxmlIvrMPEvents</MeasureId>

```

## CSV

The following is an example of Performance data for MAS in CSV format:

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime

PM,commonFormat.xsd,2005-03-24T17:40:24EST

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

47.104.11.120,MAS

SingleValues=Begin  
MeasurementKind,IntervalDuration  
Snapshot,5  
MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability  
Interrupts/sec,2005-03-24T17:45:30EST,Processor(\_Total),1111.6441874632208,Valid  
Alignment Errors,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Buffer Overrun Errors,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Bytes Received,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Bytes Received/Sec,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Bytes Transmitted,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Bytes Transmitted/Sec,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
CRC Errors,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Frames Received.,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Frames Received/Sec,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Frames Transmitted,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Frames Transmitted/Sec,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Percent Compression In,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Percent Compression Out,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Serial Overrun Errors,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Timeout Errors,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Total Errors,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Total Errors/Sec,2005-03-24T17:45:30EST,RAS Port(VPN3-0),0,Valid  
Alignment Errors,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Buffer Overrun Errors,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Bytes Received,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Bytes Received/Sec,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Bytes Transmitted,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Bytes Transmitted/Sec,2005-03-24T17:45:30EST,RAS Total,0,Valid  
CRC Errors,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Frames Received.,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Frames Received/Sec,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Frames Transmitted,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Frames Transmitted/Sec,2005-03-24T17:45:30EST,RAS Total,0,Valid  
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Percent Compression Out,2005-03-24T17:45:30EST,RAS Total,0,Valid

Serial Overrun Errors,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Timeout Errors,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Total Connections,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Total Errors/Sec,2005-03-24T17:45:30EST,RAS Total,0,Valid  
Bytes Received/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Bytes Total/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Bytes Transmitted/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Connects Core,2005-03-24T17:45:30EST,Redirector,0,Valid  
Connects Lan Manager 2.0,2005-03-24T17:45:30EST,Redirector,0,Valid  
Connects Windows NT,2005-03-24T17:45:30EST,Redirector,0,Valid  
Current Commands,2005-03-24T17:45:30EST,Redirector,0,Valid  
File Data Operations/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
File Read Operations/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
File Write Operations/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Network Errors/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Packets Received/sec,2005-03-  
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Packets Transmitted/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
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Read Bytes Cache/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Read Bytes Network/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Read Bytes Non-Paging/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Read Bytes Paging/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Read Operations Random/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Read Packets Small/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Read Packets/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
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Reads Large/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
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Server Reconnects,2005-03-24T17:45:30EST,Redirector,0,Valid  
Server Sessions,2005-03-24T17:45:30EST,Redirector,0,Valid  
Server Sessions Hung,2005-03-24T17:45:30EST,Redirector,0,Valid  
Write Bytes Cache/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
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Write Bytes Paging/sec,2005-03-24T17:45:30EST,Redirector,0,Valid

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Writes Denied/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
Writes Large/sec,2005-03-24T17:45:30EST,Redirector,0,Valid  
ActiveIvrMPConnections,2005-03-24T17:45:30EST,StreamSource,1,Valid  
AllocatedAudioBuffers,2005-03-24T17:45:30EST,StreamSource,4,Valid  
BytesProcessedPerSecond,2005-03-24T17:45:30EST,StreamSource,17216,Valid  
BytesStreamedPerSecond,2005-03-24T17:45:30EST,StreamSource,17216,Valid  
ExternalProviderConnection,2005-03-24T17:45:30EST,StreamSource,0,Valid  
PendingIvrMPConnections,2005-03-24T17:45:30EST,StreamSource,0,Valid  
TotalFilesTranscoded,2005-03-24T17:45:30EST,StreamSource,6,Valid  
% Registry Quota In Use,2005-03-  
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Alignment Fixups/sec,2005-03-24T17:45:30EST,System,0,Valid  
Context Switches/sec,2005-03-24T17:45:30EST,System,3625.1744688565486,Valid  
Exception Dispatches/sec,2005-03-24T17:45:30EST,System,0,Valid  
File Control Bytes/sec,2005-03-  
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File Control Operations/sec,2005-03-  
24T17:45:30EST,System,180.19758174010488,Valid  
File Data Operations/sec,2005-03-  
24T17:45:30EST,System,78.996104536011089,Valid  
File Read Bytes/sec,2005-03-24T17:45:30EST,System,33872.822197239737,Valid  
File Read Operations/sec,2005-03-  
24T17:45:30EST,System,43.624714445259855,Valid  
File Write Bytes/sec,2005-03-24T17:45:30EST,System,23679.57360397614,Valid  
File Write Operations/sec,2005-03-  
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Floating Emulations/sec,2005-03-24T17:45:30EST,System,0,Valid  
Processes,2005-03-24T17:45:30EST,System,63,Valid  
Processor Queue Length,2005-03-24T17:45:30EST,System,0,Valid  
System Calls/sec,2005-03-24T17:45:30EST,System,5671.4093856065074,Valid  
System Up Time,2005-03-24T17:45:30EST,System,5226.140625,Valid  
Threads,2005-03-24T17:45:30EST,System,629,Valid  
Connection Failures,2005-03-24T17:45:30EST,TCP,208,Valid  
Connections Active,2005-03-24T17:45:30EST,TCP,306,Valid  
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System=End

PMFile=End

## **GUI/CLUI Documentation for MAS**

### **GUI Launching and User procedures**

- NN10303-111 - MCP 2.0 MAS Meetme Basics

### **Related Documents**

None

## **Multimedia Communication Server (MCS)**

### **MCS Fault Interface**

This section will provide references to customer documentation for Fault, Performance, Topology, GUI/CLUI, and Security for MCS.

### **Fault documentation for MCS:**

- NN10030-111 - Multimedia Communication Server 5200 Management Module Basics
- NN10303-111 - MCP 2.0 MAS Meetme Basics
- NN10297-111 - MCP 2.0 MAS Adhoc Basics

### **Fault Mapping for MCS**

The following criteria can be used for looking up information on specific faults for MCS.



**Fault Correlation for MCS**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>            | <b>NTSTD</b>           | <b>SNMP</b>            | <b>Syslog</b>          | <b>Document Reference</b>                                                                                  |
|--------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------------------------------------------------------------------------------------------|
| <b>MCS</b>                           | logname and log number | logname and log number | logname and log number | logname and log number | NN10247-111<br>Multimedia<br>Communication<br>Server 5200<br>System<br>Management<br>Console User<br>Guide |

**Northbound Fault Formats for MCS****SCC2**

The following is an example of a MCS log in SCC2 format:

```

**55 LAM 102 0447 FLT  Fault
    Location: 47.104.23.117
    Notification Id: 1199
    State: Raised
    Category: communications
    Cause: communicationsSubsystemFailure
    Time: Mar 23 11:55:13 2004
    Component Id: Site=MgmtSite;Server=AppSvr;System.Sites.MgmtSite.Servers.
    Appsvr.Services.appsvr.BillingTransferAgent.BtaPrimaryConnectToAmLost
    Specific Problem: LAM;102
    Description: severity=MAJOR;probableCause=communications subsystem failure;
    addedText=Communication Error : Primary stream cannot connect to CAM;

```

**NTSTD**

The following is an example of a MCS log in NTSTD format:

```

RTPU07CAPT  **  LAM102 MAR23 16:55:13 0242 FLT  Fault
    Location: 47.104.23.117
    Notification Id: 1199
    State: Raised
    Category: communications
    Cause: communicationsSubsystemFailure
    Time: Mar 23 11:55:13 2004
    Component Id: Site=MgmtSite;Server=AppSvr;System.Sites.MgmtSite.Servers.
    Appsvr.Services.appsvr.BillingTransferAgent.BtaPrimaryConnectToAmLost

```

Specific Problem: LAM;102

Description: severity=MAJOR;probableCause=communications subsystem failure;  
addedText=Communication Error : Primary stream cannot connect to CAM;

## SNMP

The following is an example of a MCS log in SNMP format:

```
sysUpTime.0 => 2:19:58
snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
21.50.48
.48.52.45.51.45.50.51.44.49.49.58.53.53.58.49.51.46.
48.44.2616
alarmActiveDateAndTime => 2004-3-23,11:55:13.0
alarmActiveDescription => severity=MAJOR;probableCause=communications
subsystem
failure;addedText=Communication Error : Primary stream cannot connect to CAM;
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 6
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => LAM 102
nnExtAlarmActiveResourceDescription => IEMS=47.104.23.117-
CSE;Site=MgmtSite;Server=AppSvr;System.Sites.MgmtSite.Servers.Appsvr.Service
s.appsvr
.BillingTransferAge
nt.BtaPrimaryConnectToAmLost
nnExtAlarmActiveManualClear => 1
nnExtAlarmActiveSequenceNumber => 533
```

## Syslog

The following is an example of a MCS log in Syslog format:

```
Mar 23 12:17:08 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=1558~~ LAM102 MAJOR FLT
Fault^M      Location: 47.104.23.117^M      Notification Id: 1199^M      State:
Raised^M      Category: communications^M      Cause: communicationsSubsystemFailure^M
Time: Mar 23 11:55:13 2004^M      Component Id:
Site=MgmtSite;Server=AppSvr;System.Sites.MgmtSite.Servers.^M
Appsvr.Services.appsvr.BillingTransferAgent.BtaPrimaryConnectToAmLost^M
Specific Problem: LAM;102^M      Description:
severity=MAJOR;probableCause=communications subsystem failure^M
re;addedText=Communication Error : Primary stream cannot connect to CAM;
```

## Performance

### OM and PM Documentation references for MCS

- NN10030-111 - Multimedia Communication Server 5200 Management Module Basics
- NN10247-111 - Multimedia Communication Server 5200 System

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of Performance data for MCS in XML format:

*Not available at time of publication*

#### CSV

The following is an example of Performance data for MCS in CSV format:

*Not available at time of publication*

## GUI/CLUI Documentation for MCS

### GUI Launching and User procedures

- NN10247-111 - Multimedia Communication Server 5200 System Management Console User Guide

### Related Documents

None

## Media Gateway 9000 (MG9000)

This section contains IEMS Northbound log samples and device documentation references for the MG9000.

## MG 9000 Fault Interface

### Fault documentation for MG 9000:

- NN10074-911 MG9000 Fault Management
- NN10325-900 ATM/IP Fault Management

## Fault Mapping for MG 9000

The following criteria can be used for looking up information on specific faults for MG 9000.

### Fault Correlation for MG 9000

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                        |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------------------------|
| MG 9000                   | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10325-900<br>ATM/IP<br>Fault<br>Management |

## Northbound Fault Formats for MG 9000

### SCC2

The following is an example of a MG 9000 log in SCC2 format:

```
* 37 SWLN302 4259 TBL MG9K NorLineFault
Location: Port.frame0.shelf1.slot5.WL32.port21
Notification Id: 330712652810
State: UnAcknowledged
Category: processingError
Cause: Underlying Resource Unavailable
      NorLineFault - Line Protection Fault
Component Id: Port.frame0.shelf1.slot5.WL32.port21
specificProblem: NorLineFault - Line Protection Fault
Description: Line Protection HighVoltageError      : 0,1,5,21 [suspect b
ad LineCard]
```

### NTSTD

The following is an example of a MG 9000 log in NTSTD format:

```
RTPU07BU * SWLN302 Jan23 17:37:31 4259 TBL MG9K NorLineFault
Location: Port.frame0.shelf1.slot5.WL32.port21
Notification Id: 330712652810
State: UnAcknowledged
Category: processingError
```

```

Cause: Underlying Resource Unavailable
      NorLineFault - Line Protection Fault
Component Id: Port.frame0.shelf1.slot5.WL32.port21
specificProblem: NorLineFault - Line Protection Fault
Description: Line Protection HighVoltageError      : 0,1,5,21 [suspect b
ad LineCard]

```

## SNMP

The following is an example of a MG 9000 log in SNMP format:

```

system.sysUpTime.0 => 17:59:11
snmpTrapOID.0 => nnExtAlarmClearalarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.19.50.48
.48.52.45.49.45.50.51.44.49.48.58.52.58.50.46.54.44.41817
alarmActiveDateAndTime => 2004-1-23,10:4:2.6,
alarmActiveDescription => A Line Protection HighVoltageError has occurred.
nnExtAlarmActiveEventType => 3
nnExtAlarmActiveProbableCause => 56
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => SWLN302
nnExtAlarmActiveResourceDescription => IEMS=CC07;Port.frame0.shelf1.slot5.WL32.port21
nnExtAlarmActiveSequenceNumber => 7240

```

## Syslog

The following is an example of a MG 9000 log in Syslog format:

```

Feb 23 12:40:26 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=4323~~ SWLN302 NONE TBL
MG9K NorLineFault^M      Location: Port.frame0.shelf1.slot5.WL32.port21^M
Notification Id: 330712652810^M      State: Cleared^M      Category:
processingError^M      Cause: Underlying Resource Unavailable^M
NorLineFault - Line Protection Fault^M      Component Id:
Port.frame0.shelf1.slot5.WL32.port21^M      specificProblem: NorLineFault - Line
Protection Fault^M      Description: Line Protection HighVoltageError      : 0,1,5,21
[suspect b^M      ad LineCard]

```

## Performance

### OM and PM Documentation references for MG 9000

- NN10140-711 MG9000 Performance Management

## Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

### XML

The following is an example of Performance data for MG 9000 in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
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## CSV

The following is an example of Performance data for MG 9000 in CSV format (using GIGE):

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PM,commonFormat.xsd,2005-02-03T13:31:16EST

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SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId,Type

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172.21.4.13, MG9K Mgr

SubEntity=Begin

SubEntityId

172.21.4.13

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nnMegacoOMECANIntervalTable, Snapshot, 30, 2005-02-03T13:30:00EST

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Source, nnMegacoOMECANnumResrceReq, nnMegacoOMECANnumResrceReqFail

Value, Value, Value

Frame004.Shelf2.Slot19, 0, 0

Frame004.Shelf2.Slot21, 0, 0

Frame004.Shelf2.Slot18, 0, 0

Frame004.Shelf2.Slot20, 0, 0

Frame004.Shelf3.Slot13, 0, 0

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Frame004.Shelf3.Slot12, 0, 0

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nnMegacoQoSIntervalTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label,Label,Label,Label
Source,nnMegacoQoSIntervalBadCalls,nnMegacoQoSIntervalCalls,nnMegacoQoSIntervalJitter,nnMegacoQoSIntervalLatency,nnMegacoQoSIntervalPktLossPct,nnMegacoQoSIntervalPktsLost,nnMegacoQoSIntervalPktsRcvd
Value,Value,Value,Value,Value,Value,Value,Value
Frame004.Shelf2.Slot20.Port1,0,0,0,0,0,0,0
Frame004.Shelf2.Slot18.Port1,0,0,0,0,0,0,0
Frame004.Shelf3.Slot12.Port1,0,0,0,0,0,0,0
Frame004.Shelf2.Slot2.Port1,0,0,0,0,0,0,0
Frame004.Shelf2.Slot12.Port1,0,0,0,0,0,0,0
Frame004.Shelf2.Slot6.Port1,0,0,0,0,0,0,0
Table=End
```

Table=Begin

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnIpsecOmIntervalTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label,Label,Label,Label
Source,nnIpsecConfigInterfaceId,nnIpsecConfigSecLinkId,nnIpsecOmIntervalPacketsDiscardedIn,nnIpsecOmIntervalPacketsDiscardedOut,nnIpsecOmIntervalPacketsRx,nnIpsecOmIntervalPacketsTx
```



Value, Value, Value, Value, Value, Value, Value  
Frame004.Shelf2.Slot21,1,1,0,0,0,5453  
Frame004.Shelf2.Slot19,1,1,0,0,0,5452  
Frame004.Shelf2.Slot18,1,1,0,180,10956,10851  
Frame004.Shelf2.Slot20,1,1,0,180,10954,10849  
Frame004.Shelf3.Slot13,1,1,0,0,0,0  
Frame004.Shelf2.Slot7,1,1,0,180,13803,10851  
Frame004.Shelf3.Slot12,1,1,0,104,4711,5048  
Frame004.Shelf2.Slot6,1,1,0,0,0,8001  
Frame004.Shelf2.Slot13,1,1,0,126,4904,5308  
Frame004.Shelf2.Slot3,1,1,0,0,0,7082  
Frame004.Shelf2.Slot12,1,1,0,0,0,0  
Frame004.Shelf2.Slot11,1,1,0,0,0,0  
Frame004.Shelf2.Slot2,1,1,0,0,14411,11971  
Frame004.Shelf2.Slot10,1,1,0,0,1358,1369  
Table=End

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

nnPmOvldRscIntervTable, Snapshot, 30, 2005-02-03T13:30:00EST

Label, Label, Label, Label, Label, Label, Label, Label, Label

Source, nnPmOvldRscIntervCbvMsgRAvg, nnPmOvldRscIntervCbvMsgRPeak, nnPmOvldRscIntervConQDelAvg, nnPmOvldRscIntervConQDelPeak, nnPmOvldRscIntervCpuUtilAvg, nnPmOvldRscIntervCpuUtilPeak, nnPmOvldRscIntervPduRateAvg, nnPmOvldRscIntervPduRatePeak

Value, Value, Value, Value, Value, Value, Value, Value, Value

Frame004.Shelf2.Slot21,0,0,0,0,365,450,4,6  
Frame004.Shelf2.Slot19,0,0,0,0,373,463,4,6  
Frame004.Shelf2.Slot18,0,0,0,0,425,527,7,10  
Frame004.Shelf2.Slot20,0,0,0,0,397,496,6,9  
Frame004.Shelf3.Slot13,0,0,0,0,378,564,2,2  
Frame004.Shelf2.Slot7,0,0,0,0,387,521,6,10  
Frame004.Shelf3.Slot12,0,0,0,0,404,497,3,3  
Frame004.Shelf2.Slot6,0,0,0,0,313,486,3,5  
Frame004.Shelf2.Slot13,0,0,0,0,387,536,3,6  
Frame004.Shelf2.Slot3,0,0,0,0,360,500,4,5

```
Frame004.Shelf2.Slot12,0,0,0,0,356,456,2,2
Frame004.Shelf2.Slot11,0,0,0,0,402,534,22,35
Frame004.Shelf2.Slot2,0,0,0,0,408,505,5,8
Frame004.Shelf2.Slot10,0,0,0,0,724,1185,22,36
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnBwShelfIntervalSloaBandwResrvdTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label
Source,nnBwShelfIntervalSloaBandwReserved
Value,Value
Frame004.Shelf3,0
Frame004.Shelf2,259488
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnBwAbiIntervalBandwResrvdEntry,Snapshot,30,2005-02-03T13:30:00EST
Label,Label
Source,nnBwAbiIntervalBandwReserved
Value,Value
Frame004.Shelf2.Slot3,2544000
Frame004.Shelf2.Slot2,2544000
Frame004.Shelf2.Slot21,2544000
Frame004.Shelf2.Slot20,2544000
Frame004.Shelf2.Slot19,2544000
Frame004.Shelf2.Slot18,2544000
Frame004.Shelf2.Slot7,2544000
Frame004.Shelf2.Slot6,2673744
Table=End
```

```
Table=Begin
```

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
etherHistoryHighCapacityTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label
Source,etherHistoryHighCapacityOctets,etherHistoryHighCapacityOverflowOctets
,etherHistoryHighCapacityOverflowPkts,etherHistoryHighCapacityPkts
Value,Value,Value,Value,Value
Frame004.Shelf2.Slot10.Port3,0,0,0,0
Frame004.Shelf2.Slot10.Port2,0,0,0,0
Frame004.Shelf2.Slot10.Port1,109813501,0,0,756205
Frame004.Shelf2.Slot11.Port4,0,0,0,0
Frame004.Shelf2.Slot11.Port3,0,0,0,0
Frame004.Shelf2.Slot11.Port2,0,0,0,0
Frame004.Shelf2.Slot11.Port1,26340641,0,0,381439
Frame004.Shelf2.Slot10.Port4,0,0,0,0
Table=End
```

Table=Begin

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnPmUtilOmIntervTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label
Source,nnPmUtilIntervChanAvg,nnPmUtilIntervChanPeak,nnPmUtilIntervCpuAvg,nnP
mUtilIntervCpuPeak,nnPmUtilIntervFlashAvg,nnPmUtilIntervFlashPeak,nnPmUtilIn
tervRamAvg,nnPmUtilIntervRamPeak
Value,Value,Value,Value,Value,Value,Value,Value,Value,Value
Frame004.Shelf2.Slot21,0,0,3,5,14,17,27,32
Frame004.Shelf2.Slot19,0,0,3,5,14,17,27,32
Frame004.Shelf2.Slot20,0,0,4,5,14,17,27,32
Frame004.Shelf2.Slot18,0,0,4,5,14,17,27,32
Frame004.Shelf3.Slot13,0,0,4,6,23,27,56,67
Frame004.Shelf2.Slot7,0,0,5,5,17,17,32,32
Frame004.Shelf3.Slot12,0,0,4,5,21,25,56,67
Frame004.Shelf2.Slot6,0,0,4,5,14,17,27,32
Frame004.Shelf2.Slot15,0,0,3,7,16,19,29,35
Frame004.Shelf2.Slot14,0,0,3,3,25,30,29,35
Frame004.Shelf2.Slot13,0,0,4,5,20,24,55,66
Frame004.Shelf2.Slot3,0,0,3,5,26,31,27,32
```

```
Frame004.Shelf2.Slot12,0,0,3,5,20,24,55,66
Frame004.Shelf2.Slot2,0,0,4,5,14,17,27,32
Frame004.Shelf2.Slot11,0,0,4,5,9,11,33,39
Frame004.Shelf2.Slot10,0,0,7,12,9,11,33,39
Table=End
```

Table=Begin

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnRelMsgSctpAssocOmIntervTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label
Source,nnRelMsgSctpAscIntervAbort,nnRelMsgSctpAscIntervClosed,nnRelMsgSctpAscIntervCongCleared,nnRelMsgSctpAscIntervCongCount,nnRelMsgSctpAscIntervDiscPacks,nnRelMsgSctpAscIntervInPacks,nnRelMsgSctpAscIntervOutPacks,nnRelMsgSctpAscIntervRetranPacks,nnRelMsgSctpAscIntervT1expires,nnRelMsgSctpAscIntervT2expires,nnRelMsgSctpAscIntervT3expires
Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value
Frame004.Shelf2.Slot3,0,0,0,0,0,0,1095,917,0,0,0,0
Frame004.Shelf2.Slot2,0,0,0,0,0,0,1408,1308,0,0,0,0
Frame004.Shelf2.Slot21,0,0,0,0,0,0,1474,1154,0,0,0,0
Frame004.Shelf2.Slot20,0,0,0,0,0,0,1499,1595,0,0,0,0
Frame004.Shelf2.Slot19,0,0,0,0,0,0,1670,1194,0,0,0,0
Frame004.Shelf2.Slot18,0,0,0,0,0,0,3340,3159,0,0,0,0
Frame004.Shelf2.Slot7,0,0,0,0,0,0,1725,1652,0,0,0,0
Frame004.Shelf2.Slot6,0,0,0,0,0,0,975,877,0,0,0,0
Table=End
```

Table=Begin

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnMegacoOMCESIntervalTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label
Source,nnMegacoOMCESnumChnlAllocInter,nnMegacoOMCESnumChnlAllocInterFail,nnMegacoOMCESnumChnlAllocIntra,nnMegacoOMCESnumChnlAllocIntraFail
Value,Value,Value,Value,Value
Frame004.Shelf2.Slot21,0,0,0,0
Frame004.Shelf2.Slot19,0,0,0,0
Frame004.Shelf2.Slot18,0,0,0,0
```

```
Frame004.Shelf2.Slot20,0,0,0,0
Frame004.Shelf3.Slot13,0,0,0,0
Frame004.Shelf2.Slot7,0,0,0,0
Frame004.Shelf3.Slot12,0,0,0,0
Frame004.Shelf2.Slot6,0,0,0,0
Frame004.Shelf2.Slot13,0,0,0,0
Frame004.Shelf2.Slot3,0,0,0,0
Frame004.Shelf2.Slot12,0,0,0,0
Frame004.Shelf2.Slot11,0,0,0,0
Frame004.Shelf2.Slot2,0,0,0,0
Frame004.Shelf2.Slot10,0,0,0,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnBwAbiCurrentBandwResrvdTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label
Source,nnBwAbiCapacityBandwReserved
Value,Value
Frame004.Shelf2.Slot3,0
Frame004.Shelf2.Slot2,0
Frame004.Shelf2.Slot21,0
Frame004.Shelf2.Slot20,0
Frame004.Shelf2.Slot19,0
Frame004.Shelf2.Slot18,0
Frame004.Shelf2.Slot7,0
Frame004.Shelf2.Slot6,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnClkSyncRefTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label
```

Source, nnClkSyncRefId, nnClkSyncRefLossOfFrameCount, nnClkSyncRefLossOfSignalCount

Value, Value, Value, Value

Frame004.Shelf2.Slot12, 7, 0, 0

Frame004.Shelf2.Slot13, 7, 0, 0

Table=End

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

nnBwShelfCurrentSloaBandwResrvdTable, Snapshot, 30, 2005-02-03T13:30:00EST

Label, Label

Source, nnBwShelfCapacitySloaBandwReserved

Value, Value

Frame004.Shelf3, 20759040

Frame004.Shelf2, 20759040

Table=End

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

nnGLinkOmIntervTable, Snapshot, 30, 2005-02-03T13:30:00EST

Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label, Label

Source, nnGLinkIntervESS, nnGLinkIntervOPR, nnGLinkIntervOPT, nnGLinkIntervRxBadOpCntlFrames, nnGLinkIntervRxControlFrames, nnGLinkIntervRxFcsFail, nnGLinkIntervRxGoodPause, nnGLinkIntervRxLenTypeFail, nnGLinkIntervSESS, nnGLinkIntervTBC, nnGLinkIntervTEMP, nnGLinkIntervTxBytes, nnGLinkIntervTxBytesOverflow, nnGLinkIntervTx Fifo Overruns, nnGLinkIntervTx Fifo Underruns, nnGLinkIntervUASS, nnGLinkIntervVCC

Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value, Value

Frame004.Shelf2.Slot10.Port3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

Frame004.Shelf2.Slot10.Port2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

Frame004.Shelf2.Slot10.Port1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 108616246, 0, 0, 0, 0, 0

Frame004.Shelf2.Slot11.Port4, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

Frame004.Shelf2.Slot11.Port3, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

Frame004.Shelf2.Slot11.Port2, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

Frame004.Shelf2.Slot11.Port1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 23321822, 0, 0, 0, 0, 0

```
Frame004.Shelf2.Slot10.Port4,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Table=End
```

```
Table=Begin
```

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
```

```
etherHistoryTable,Snapshot,30,2005-02-03T13:30:00EST
```

```
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label
```

```
Source,etherHistoryBroadcastPkts,etherHistoryCRCAlignErrors,etherHistoryCollisions,etherHistoryDropEvents,etherHistoryFragments,etherHistoryJabbers,etherHistoryMulticastPkts,etherHistoryOctets,etherHistoryOversizePkts,etherHistoryPkts,etherHistoryUndersizePkts,etherHistoryUtilization
```

```
Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value
```

```
Frame004.Shelf2.Slot10.Port3,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Frame004.Shelf2.Slot10.Port2,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Frame004.Shelf2.Slot10.Port1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,4
```

```
Frame004.Shelf2.Slot11.Port4,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Frame004.Shelf2.Slot11.Port3,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Frame004.Shelf2.Slot11.Port2,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Frame004.Shelf2.Slot11.Port1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Frame004.Shelf2.Slot10.Port4,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0
```

```
Table=End
```

```
Table=Begin
```

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
```

```
nnPmOvldConnDenyIntervTable,Snapshot,30,2005-02-03T13:30:00EST
```

```
Label,Label
```

```
Source,nnPmOvldConnDenyIntervCount
```

```
Value,Value
```

```
Frame004.Shelf2.Slot21,0
```

```
Frame004.Shelf2.Slot19,0
```

```
Frame004.Shelf2.Slot18,0
```

```
Frame004.Shelf2.Slot20,0
```

```
Frame004.Shelf3.Slot13,0
```

```
Frame004.Shelf2.Slot7,0
```

```
Frame004.Shelf3.Slot12,0
Frame004.Shelf2.Slot6,0
Frame004.Shelf2.Slot13,0
Frame004.Shelf2.Slot3,0
Frame004.Shelf2.Slot12,0
Frame004.Shelf2.Slot11,0
Frame004.Shelf2.Slot2,0
Frame004.Shelf2.Slot10,0
Table=End
```

```
Table=Begin
```

```
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnMegacoOMMedGwyIntervalTable,Snapshot,30,2005-02-03T13:30:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label
Source,nnMegacoOMMedGwyAvrgInMsgRate,nnMegacoOMMedGwyAvrgOutMsgRate,nnMegaco
OMMedGwyMaxInMsgRate,nnMegacoOMMedGwyMaxOutMsgRate,nnMegacoOMMedGwyNumInMess
ages,nnMegacoOMMedGwyNumInOctets,nnMegacoOMMedGwyNumOutMessages,nnMegacoOMMe
dGwyNumOutOctets
Value,Value,Value,Value,Value,Value,Value,Value,Value
Frame004.Shelf2.Slot20.Port1,24,24,0,0,709,41423,709,50655
Frame004.Shelf2.Slot18.Port1,21,21,0,0,618,35152,618,43381
Frame004.Shelf3.Slot12.Port1,10,10,0,0,304,13502,304,17684
Frame004.Shelf2.Slot2.Port1,0,0,0,0,0,0,0,0
Frame004.Shelf2.Slot12.Port1,10,10,0,0,311,13922,311,18800
Frame004.Shelf2.Slot6.Port1,27,27,0,0,819,47329,819,57626
Table=End
```

```
SingleValues=Begin
```

```
MeasurementKind,IntervalDuration
Snapshot,30
MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability
snmpInvalidMsgs,2005-02-03T13:30:00EST,Miscellaneous,0,Valid
snmpInBadCommunityNames,2005-02-03T13:30:00EST,Miscellaneous,0,Valid
snmpInPkts,2005-02-03T13:30:00EST,Miscellaneous,22953,Valid
nnPmSnmpIntervReqPeak,2005-02-03T13:30:00EST,nnPmSnmpOmIntervTable,40,Valid
```



```
nnPmSnmPIntervReqAvg, 2005-02-03T13:30:00EST, nnPmSnmPOmIntervTable, 129, Valid
nnPmSnmPIntervNotifPeak, 2005-02-03T13:30:00EST, nnPmSnmPOmIntervTable, 3, Valid
nnPmSnmPIntervNotifAvg, 2005-02-03T13:30:00EST, nnPmSnmPOmIntervTable, 5, Valid
nnClkSyncSignalId, 2005-02-03T13:30:00EST, nnClkSyncSignalTable, 7, Valid
nnClkSyncSignalLossOfSignalCount, 2005-02-
03T13:30:00EST, nnClkSyncSignalTable, 0, Valid
nnClkSyncSignalLossOfFrameCount, 2005-02-
03T13:30:00EST, nnClkSyncSignalTable, 0, Valid
nnBwBandwUtilIntervalInCellRate, 2005-02-
03T13:30:00EST, nnBwIntervalBandwUtilTable, 45811, Valid
nnBwBandwUtilIntervalOutCellRate, 2005-02-
03T13:30:00EST, nnBwIntervalBandwUtilTable, 45318, Valid
nnBwBandwUtilIntervalInDslCellRate, 2005-02-
03T13:30:00EST, nnBwIntervalBandwUtilTable, 0, Valid
nnBwBandwUtilIntervalOutDslCellRate, 2005-02-
03T13:30:00EST, nnBwIntervalBandwUtilTable, 0, Valid
nnBwQueueFillIntervalTotal, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalCbr, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalRtVbr, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalNrtVbr, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalUbr, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalUbrPlus, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalControl, 2005-02-
03T13:30:00EST, nnBwIntervalQueueFillTable, 0, Valid
SingleValues=End
```

SubEntity=End

Entity=End

System=End

PMFile=End

## CSV

The following is an example of Performance data for MG 9000 in CSV format

```
PMFile=Begin
MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime
PM,commonFormat.xsd,2005-01-18T15:45:34EST

System=Begin
SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId,Type
172.31.125.226,MG9K Mgr

SubEntity=Begin
SubEntityId
172.31.125.226

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnMegacoOMECANIntervalTable,Snapshot,15,2005-01-18T15:45:00EST
Label,Label,Label
Source,nnMegacoOMECANNumResrceReq,nnMegacoOMECANNumResrceReqFail
Value,Value,Value
Frame008.Shelf1.Slot17,0,0
Frame008.Shelf1.Slot16,0,0
Frame008.Shelf1.Slot5,0,0
Frame008.Shelf1.Slot4,0,0
Frame008.Shelf1.Slot13,0,0
Frame008.Shelf1.Slot12,0,0
Table=End

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnMegacoOMDSPIntervalTable,Snapshot,15,2005-01-18T15:45:00EST
Label,Label,Label,Label,Label,Label,Label,Label
Source,nnMegacoOMDSPnumCMRmodemReq,nnMegacoOMDSPnumCMRmodemReqFail,nnMegacoO
MDSPnumToneGenReq,nnMegacoOMDSPnumToneGenReqFail,nnMegacoOMDSPnumToneRcvrReq
,nnMegacoOMDSPnumToneRcvrReqFail
Value,Value,Value,Value,Value,Value,Value,Value
Frame008.Shelf1.Slot17,0,0,0,0,0,0,0
Frame008.Shelf1.Slot16,0,0,0,0,0,0,0
Frame008.Shelf1.Slot5,0,0,0,0,0,0,0
Frame008.Shelf1.Slot4,0,0,0,0,0,0,0
Frame008.Shelf1.Slot13,0,0,0,0,0,0,0
Frame008.Shelf1.Slot12,0,0,0,0,0,0,0
Table=End

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnMegacoQoSIntervalTable,Snapshot,15,2005-01-18T15:45:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label
Source,nnMegacoQoSIntervalBadCalls,nnMegacoQoSIntervalCalls,nnMegacoQoSInter
valJitter,nnMegacoQoSIntervalLatency,nnMegacoQoSIntervalPktLossPct,nnMegacoQ
oSIntervalPktsLost,nnMegacoQoSIntervalPktsRecv
```

```
Value, Value, Value, Value, Value, Value, Value, Value
Frame008.Shelf1.Slot4.Port1, 0, 0, 0, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot16.Port1, 0, 0, 0, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot12.Port1, 0, 0, 0, 0, 0, 0, 0, 0
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
nnIpsecOmIntervalTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label, Label, Label, Label, Label
Source, nnIpsecConfigInterfaceId, nnIpsecConfigSecLinkId, nnIpsecOmIntervalPack
etsDiscardedIn, nnIpsecOmIntervalPacketsDiscardedOut, nnIpsecOmIntervalPackets
Rx, nnIpsecOmIntervalPacketsTx
Value, Value, Value, Value, Value, Value, Value, Value
Frame008.Shelf1.Slot17, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot16, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot5, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot4, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot13, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot12, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot11, 1, 1, 0, 0, 0, 0, 0
Frame008.Shelf1.Slot10, 1, 1, 0, 0, 0, 0, 0
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
nnPmOvldRscIntervTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label, Label, Label, Label, Label, Label, Label
Source, nnPmOvldRscIntervCbvMsgRAvg, nnPmOvldRscIntervCbvMsgRPeak, nnPmOvldRscI
ntervConQDelAvg, nnPmOvldRscIntervConQDelPeak, nnPmOvldRscIntervCpuUtilAvg, nnP
mOvldRscIntervCpuUtilPeak, nnPmOvldRscIntervPduRateAvg, nnPmOvldRscIntervPduRa
tePeak
Value, Value, Value, Value, Value, Value, Value, Value, Value, Value
Frame008.Shelf1.Slot17, 0, 0, 0, 0, 514, 552, 5, 6
Frame008.Shelf1.Slot16, 0, 0, 0, 0, 494, 498, 5, 5
Frame008.Shelf1.Slot5, 0, 1, 0, 0, 435, 449, 5, 6
Frame008.Shelf1.Slot4, 0, 0, 0, 0, 451, 476, 6, 8
Frame008.Shelf1.Slot13, 0, 2, 0, 3, 545, 567, 5, 6
Frame008.Shelf1.Slot12, 0, 0, 0, 0, 591, 649, 6, 9
Frame008.Shelf1.Slot11, 0, 0, 0, 0, 428, 483, 17, 27
Frame008.Shelf1.Slot10, 0, 2, 0, 0, 554, 995, 17, 25
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
nnBwShelfIntervalSloaBandwResrvdTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label
Source, nnBwShelfIntervalSloaBandwReserved
Value, Value
Frame008.Shelf1, 897
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
sonetPathIntervalTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label, Label
```

```
Source,sonetPathIntervalCVs,sonetPathIntervalESs,sonetPathIntervalSEs,sonet
PathIntervalUASs
Value,Value,Value,Value,Value
Frame008.Shelf1.Slot11.Port1,0,0,0,0
Frame008.Shelf1.Slot10.Port1,0,0,0,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnBwAbiIntervalBandwResrvdEntry,Snapshot,15,2005-01-18T15:45:00EST
Label,Label
Source,nnBwAbiIntervalBandwReserved
Value,Value
Frame008.Shelf1.Slot17,6000
Frame008.Shelf1.Slot16,7000
Frame008.Shelf1.Slot5,6612
Frame008.Shelf1.Slot4,7000
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnPmUtilOmIntervTable,Snapshot,15,2005-01-18T15:45:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label
Source,nnPmUtilIntervChanAvg,nnPmUtilIntervChanPeak,nnPmUtilIntervCpuAvg,nnP
mUtilIntervCpuPeak,nnPmUtilIntervFlashAvg,nnPmUtilIntervFlashPeak,nnPmUtilIn
tervRamAvg,nnPmUtilIntervRamPeak
Value,Value,Value,Value,Value,Value,Value,Value,Value
Frame008.Shelf1.Slot5,0,0,4,4,17,17,32,32
Frame008.Shelf1.Slot4,0,0,5,5,17,17,32,32
Frame008.Shelf1.Slot17,0,0,5,6,17,17,32,32
Frame008.Shelf1.Slot16,0,0,5,5,17,17,32,32
Frame008.Shelf1.Slot15,0,0,2,2,19,19,36,36
Frame008.Shelf1.Slot14,0,0,2,2,18,18,36,36
Frame008.Shelf1.Slot13,0,0,5,6,24,24,32,32
Frame008.Shelf1.Slot12,0,0,6,6,24,24,32,32
Frame008.Shelf1.Slot11,0,0,4,5,47,47,37,37
Frame008.Shelf1.Slot10,0,1,6,10,23,23,38,38
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
nnRelMsgSctpAssocOmIntervTable,Snapshot,15,2005-01-18T15:45:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label
Source,nnRelMsgSctpAscIntervAbort,nnRelMsgSctpAscIntervClosed,nnRelMsgSctpAs
cIntervCongCleared,nnRelMsgSctpAscIntervCongCount,nnRelMsgSctpAscIntervDiscP
acks,nnRelMsgSctpAscIntervInPacks,nnRelMsgSctpAscIntervOutPacks,nnRelMsgSctp
AscIntervRetranPacks,nnRelMsgSctpAscIntervT1expires,nnRelMsgSctpAscIntervT2e
xpires,nnRelMsgSctpAscIntervT3expires
Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value
Frame008.Shelf1.Slot17,0,0,0,0,0,0,467,487,0,0,0,0
Frame008.Shelf1.Slot16,0,0,0,0,0,0,465,485,0,0,0,0
Frame008.Shelf1.Slot5,0,0,0,0,0,0,761,697,0,0,0,0
Frame008.Shelf1.Slot4,0,0,0,0,0,0,792,726,0,0,0,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
```

```
sonetLineIntervalTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label, Label
Source, sonetLineIntervalCVs, sonetLineIntervalESS, sonetLineIntervalSESS, sonet
LineIntervalUASS
Value, Value, Value, Value, Value
Frame008.Shelf1.Slot11.Port1, 0, 0, 0, 0
Frame008.Shelf1.Slot10.Port1, 0, 0, 0, 0
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
nnMegacoOMCESIntervalTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label, Label
Source, nnMegacoOMCESnumChnlAllocInter, nnMegacoOMCESnumChnlAllocInterFail, nnM
egacoOMCESnumChnlAllocIntra, nnMegacoOMCESnumChnlAllocIntraFail
Value, Value, Value, Value, Value
Frame008.Shelf1.Slot17, 0, 0, 0, 0
Frame008.Shelf1.Slot16, 0, 0, 0, 0
Frame008.Shelf1.Slot5, 0, 0, 0, 0
Frame008.Shelf1.Slot4, 0, 0, 0, 0
Frame008.Shelf1.Slot13, 0, 0, 0, 0
Frame008.Shelf1.Slot12, 0, 0, 0, 0
Frame008.Shelf1.Slot11, 3, 0, 0, 0
Frame008.Shelf1.Slot10, 3, 0, 0, 0
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
nnBwAbiCurrentBandwResrvdTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label
Source, nnBwAbiCapacityBandwReserved
Value, Value
Frame008.Shelf1.Slot17, 0
Frame008.Shelf1.Slot16, 0
Frame008.Shelf1.Slot5, 0
Frame008.Shelf1.Slot4, 0
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
sonetSectionIntervalTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label, Label
Source, sonetSectionIntervalCVs, sonetSectionIntervalESS, sonetSectionIntervals
EFSS, sonetSectionIntervalSESS
Value, Value, Value, Value, Value
Frame008.Shelf1.Slot11.Port1, 0, 0, 0, 0
Frame008.Shelf1.Slot10.Port1, 0, 0, 0, 0
Table=End
```

```
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime
nnClkSyncRefTable, Snapshot, 15, 2005-01-18T15:45:00EST
Label, Label, Label, Label
Source, nnClkSyncRefId, nnClkSyncRefLossOfFrameCount, nnClkSyncRefLossOfSignalC
ount
Value, Value, Value, Value
Frame008.Shelf1.Slot13, 3, 0, 1
```

```
Frame008.Shelf1.Slot12,3,0,3  
Table=End
```

```
Table=Begin  
TableId,MeasurementKind,IntervalDuration,CaptureTime  
nnBwShelfCurrentSloaBandwResrvdTable,Snapshot,15,2005-01-18T15:45:00EST  
Label,Label  
Source,nnBwShelfCapacitySloaBandwReserved  
Value,Value  
Frame008.Shelf1,48960  
Table=End
```

```
Table=Begin  
TableId,MeasurementKind,IntervalDuration,CaptureTime  
norCarrSonetMediumIntervalTable,Snapshot,15,2005-01-18T15:45:00EST  
Label,Label,Label  
Source,nnorCarrSonetMedIntervalLBC,norCarrSonetMedIntervalOpt  
Value,Value,Value  
Frame008.Shelf1.Slot11.Port1,106,99  
Frame008.Shelf1.Slot10.Port1,103,100  
Table=End
```

```
Table=Begin  
TableId,MeasurementKind,IntervalDuration,CaptureTime  
nnPmOvldConnDenyIntervTable,Snapshot,15,2005-01-18T15:45:00EST  
Label,Label  
Source,nnPmOvldConnDenyIntervCount  
Value,Value  
Frame008.Shelf1.Slot17,0  
Frame008.Shelf1.Slot16,0  
Frame008.Shelf1.Slot5,0  
Frame008.Shelf1.Slot4,0  
Frame008.Shelf1.Slot13,0  
Frame008.Shelf1.Slot12,0  
Frame008.Shelf1.Slot11,0  
Frame008.Shelf1.Slot10,0  
Table=End
```

```
Table=Begin  
TableId,MeasurementKind,IntervalDuration,CaptureTime  
apsChanStatusTable,Snapshot,15,2005-01-18T15:45:00EST  
Label,Label,Label,Label  
Source,apsChanSignalDegrades,apsChanSignalFailures,apsChanSwitchovers  
Value,Value,Value,Value  
Frame008.Shelf1.Slot11.Port1,0,0,0  
Frame008.Shelf1.Slot10.Port1,0,0,0  
Table=End
```

```
Table=Begin  
TableId,MeasurementKind,IntervalDuration,CaptureTime  
nnMegacoOMMedGwyIntervalTable,Snapshot,15,2005-01-18T15:45:00EST  
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label  
Source,nnMegacoOMMedGwyAvrgInMsgRate,nnMegacoOMMedGwyAvrgOutMsgRate,nnMegaco  
OMMedGwyMaxInMsgRate,nnMegacoOMMedGwyMaxOutMsgRate,nnMegacoOMMedGwyNumInMess  
ages,nnMegacoOMMedGwyNumInOctets,nnMegacoOMMedGwyNumOutMessages,nnMegacoOMMe  
dGwyNumOutOctets
```

```
Value, Value, Value, Value, Value, Value, Value, Value, Value, Value
Frame008.Shelf1.Slot4.Port1, 29, 29, 0, 0, 438, 25752, 438, 36018
Frame008.Shelf1.Slot16.Port1, 29, 29, 0, 0, 440, 25867, 440, 33229
Frame008.Shelf1.Slot12.Port1, 53, 53, 0, 0, 805, 50834, 805, 52001
Table=End
```

```
SingleValues=Begin
MeasurementKind, IntervalDuration
Snapshot, 15
MeasureId, CaptureTime, MeasureSuppId1, Value, Reliability
snmpInvalidMsgs, 2005-01-18T15:45:00EST, Miscellaneous, 0, Valid
snmpInBadCommunityNames, 2005-01-18T15:45:00EST, Miscellaneous, 0, Valid
snmpInPkts, 2005-01-18T15:45:00EST, Miscellaneous, 124921, Valid
nnPmSnmpIntervReqPeak, 2005-01-18T15:45:00EST, nnPmSnmpOmIntervTable, 40, Valid
nnPmSnmpIntervReqAvg, 2005-01-18T15:45:00EST, nnPmSnmpOmIntervTable, 126, Valid
nnPmSnmpIntervNotifPeak, 2005-01-18T15:45:00EST, nnPmSnmpOmIntervTable, 0, Valid
nnPmSnmpIntervNotifAvg, 2005-01-18T15:45:00EST, nnPmSnmpOmIntervTable, 0, Valid
nnClkSyncSignalId, 2005-01-18T15:45:00EST, nnClkSyncSignalTable, 5, Valid
nnClkSyncSignalLossOfSignalCount, 2005-01-
18T15:45:00EST, nnClkSyncSignalTable, 3, Valid
nnClkSyncSignalLossOfFrameCount, 2005-01-
18T15:45:00EST, nnClkSyncSignalTable, 0, Valid
nnBwBandwUtilIntervalInCellRate, 2005-01-
18T15:45:00EST, nnBwIntervalBandwUtilTable, 878, Valid
nnBwBandwUtilIntervalOutCellRate, 2005-01-
18T15:45:00EST, nnBwIntervalBandwUtilTable, 936, Valid
nnBwBandwUtilIntervalInDslCellRate, 2005-01-
18T15:45:00EST, nnBwIntervalBandwUtilTable, 0, Valid
nnBwBandwUtilIntervalOutDslCellRate, 2005-01-
18T15:45:00EST, nnBwIntervalBandwUtilTable, 0, Valid
nnBwQueueFillIntervalTotal, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalCbr, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalRtVbr, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalNrtVbr, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalUbr, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalUbrPlus, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
nnBwQueueFillIntervalControl, 2005-01-
18T15:45:00EST, nnBwIntervalQueueFillTable, 0, Valid
SingleValues=End

SubEntity=End

Entity=End

System=End

PMFile=End
```

## GUI/CLUI Documentation for MG 9000

### GUI Launching and User procedures

- NN10096-511 MG9000 Configuration Management

### Related documents

- NN10276-500 ATM/IP Configuration Management

## MultiService Switch 7400, 15000, 20000

This section contains IEMS Northbound log samples and device documentation references for the MSS 7400, 15000, 20000.

Information for this device is covered in MDM documentation. *Please refer to Section “ Multi-Service Data Manager (MDM)” on page 608.* for more details.

### MSS 7400, 15000, 20000 Fault Interface

#### Fault documentation for MSS 7400, 15000, 20000 :

*Please refer to Section “ Fault documentation for MDM:” on page 608.*

#### Fault Mapping for MSS 7400, 15000, 20000

*Please refer to Section “ Fault Mapping for MDM” on page 608.*

### Northbound Fault Formats for MSS 7400, 15000, 20000

#### SCC2

The following is an example of a MSS 7400, 15000, 20000 log in SCC2 format:

```
19 PPEM302 8013 TBL
time: 2004 01 27 14 19 53
event: message
compId: EM PP04 LP 8
severity: indeterminate
faultcode: 70560000
alarmType: other
```



```
commentData: 1-7-200
0000
1;DBG_WARNING:R:21-L:18 stats timeout.
```

## NTSTD

The following is an example of a MSS 7400, 15000, 20000 log in NTSTD format:

```
RTPU07BU      PPEM302 Jan27 19:19:53 7467 TBL
time: 2004 01 27 14 19 53
event: message
compId: EM PP04 LP 8
severity: indeterminate
faultcode: 70560000
alarmType: other
commentData: 1-7-200
0000
1;DBG_WARNING:R:21-L:18 stats timeout.
```

## SNMP

The following is an example of a MSS 7400, 15000, 20000 log in SNMP format:

```
sysUpTime. => 0:28:39
snmpTrapOID. => nnExtAlarmMinor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
20.50.48
.48.52.45.54.45.50.52.44.51.58.53.51.58.52.49.46.48.44.5248
alarmActiveDateAndTime => 2004-6-24,3:53:41.0
alarmActiveDescription => Far end has raised a Line Remote Failure Indication
alarm (rxRfiAlarm).
Check the operational attributes of the far-end.
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => 70115203
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0m3.us.nortel.com-MDM-
Mgr;EM MANTEO
```

LP 3 SONET 2

nnExtAlarmActiveManualClear => 1

nnExtAlarmActiveSequenceNumber => 1375

### Syslog

The following is an example of a MSS 7400, 15000, 20000 log in Syslog format:

```
Feb 27 13:19:58 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=2202~~ PPEM302 NONE TBL ^M
time: 2004 01 27 14 19 53^M          event: message^M          compId: EM PP04 LP 8^M
severity: indeterminate^M          faultcode: 70560000^M          alarmType: other^M
commentData: 1-7-200^M          0000 ^M          1;DBG_WARNING:R:21-L:18 stats timeout.
```

## Performance

### OM and PM Documentation references for MSS 7400, 15000, 20000

*Please refer to Section “ OM and PM Documentation references for MDM” on page 611.*

### Northbound OM/PM Formats

Performance measurements for MSS 7400, 15000, 20000 are available only from the MDM directly. *Please refer to Section “ Northbound OM/PM Formats” on page 611.*

### XML

The following is an example of Performance data for MSS 7400, 15000, 20000 in XML format:

**Note:** *The IEMS northbound performance interface does not support this device.*

### CSV

The following is an example of Performance data for MSS 7400, 15000, 20000 in CSV format:

**Note:** *The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for MSS 7400, 15000, 20000

### GUI Launching and User procedures

Please refer to *[“GUI/CLUI Documentation for MDM” on page 615.](#)*

- NN10600-030 - Nortel Networks Multiservice Switch 7400/15000/20000 Overview
- 241-5701-045 - Passport “7400,” “15000,” 20000 Management System User Interface Guide
- NN10600-050 - Nortel Networks Multiservice Switch 7400/15000/20000 Commands Reference
- NN10600-053 - Nortel Networks Multiservice Switch 7400/15000/20000 Commands Job Aid

### Related documents

Please refer to *[“Related documents” on page 615.](#)*

- NN10600-001 - Nortel Networks Multiservice Switch 7400/15000/20000 Using the Documentation
- NN10600-002 - Nortel Networks Multiservice Switch 7400/15000/20000 Using Task-based Documentation Job Aid
- NN10600-005 - Nortel Networks Multiservice Switch 7400/15000/20000 Terminology
- NN10600-030 - Nortel Networks Multiservice Switch 7400/15000/20000 Overview
- NN10600-270 - Nortel Networks Multiservice Switch 7400/15000/20000 Software Installation
- NN10600-271 - Nortel Networks Multiservice Switch 7400/15000/20000 Network Management Connectivity
- NN10600-272 - Nortel Networks Multiservice Switch 7400/15000/20000 Upgrading Software
- NN10600-300 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: SNMP
- 241-5701-400 - Passport “7400,” “15000,” 20000 Networking Overview
- NN10600-405 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Call Server
- NN10600-410 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Call Redirection Server
- NN10600-415 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Hunt Group Server

- NN10600-420 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Trunking
- NN10600-425 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Dynamic Packet Routing System
- NN10600-435 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Path-Oriented Routing System
- NN10600-440 - Nortel Networks Multiservice Switch 7400 Operations: Frame Relay Managed Cut-through Switching
- NN10600-445 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Multiprotocol Label Switching
- NN10600-500 - Nortel Networks Multiservice Switch 7400/15000/20000 Alarms Reference
- NN10600-510 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Trace System
- NN10600-520 - Nortel Networks Multiservice Switch 7400/15000/20000 Fault and Performance Management: Troubleshooting
- NN10600-581 - Nortel Networks Multiservice Switch 7400/15000/20000 IP VPN Technology Fundamentals
- NN10600-582 - Nortel Networks Multiservice Switch 7400/15000/20000 IP VPN Configuration Management
- NN10600-550 - Nortel Networks Multiservice Switch 7400/15000/20000 Common Configuration Procedures
- NN10600-561 - Nortel Networks Multiservice Switch 7400/15000/20000 Data Management
- NN10600-551 - Nortel Networks Multiservice Switch 7400/15000/20000 FP Configuration Reference
- NN10600-560 - Nortel Networks Multiservice Switch 7400/15000/20000 Accounting
- NN10600-700 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Technology Fundamentals
- NN10600-702 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Routing and Signaling Fundamentals
- NN10600-705 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Traffic Management Fundamentals
- NN10600-706 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Traffic Shaping and Policing Fundamentals
- NN10600-707 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Queuing and Scheduling Fundamentals

- NN10600-708 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM CAC and Bandwidth Fundamentals
- NN10600-710 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Configuration Management
- NN10600-715 - Nortel Networks Multiservice Switch 7400/15000/20000 ATM Fault and Performance Management
- NN10600-720 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: AAL1 Circuit Emulation
- NN10600-730 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Inverse Multiplexing for ATMe
- NN10600-780 - Nortel Networks Media Gateway 7480/15000 Technology Fundamentals
- NN10600-781 - Nortel Networks Media Gateway 7480/15000 Non-switched Service Configuration Management
- NN10600-782 - Nortel Networks Media Gateway 7480/15000 Switched Service Configuration Management
- NN10600-800 - Nortel Networks Multiservice Switch 7400/15000/20000 IP Technology Fundamentals
- NN10600-801 - Nortel Networks Multiservice Switch 7400/15000/20000 IP Configuration Management
- NN10600-580 - Nortel Networks Multiservice Switch 7400/15000/20000 Operations: Ethernet Service
- NN10600-120 - Nortel Networks Multiservice Switch 15000/20000 Hardware Description
- NN10600-130 - Nortel Networks Multiservice Switch 15000/20000 Hardware Installation, Maintenance, and Upgrade
- NN10600-170 - Nortel Networks Multiservice Switch 7400 Hardware Description
- NN10600-130 - Nortel Networks Multiservice Switch 15000/20000 Hardware Installation, Maintenance, and Upgrade
- NN10600-172 - Nortel Networks Multiservice Switch 7400 FP Cabling Reference
- NN10600-745 - Nortel Networks Multiservice Switch 7400 Operations: MPANL
- NN10600-750 - Nortel Networks Multiservice Switch 7400 Operations: Voice Transport
- NN10600-755 - Nortel Networks Multiservice Switch 7400 Operations: Voice Networking

- NN10600-765 - Nortel Networks Multiservice Switch 7400 Operations: Remote Server Agent
- NN10600-605 - Passport MDM Network Security: Operations
- NN10600-606 - Passport MDM Network Security: User Access Configuration
- NN10600-607 - Passport MDM Network Security: Secure Communications Configuration
- 241-6001-309 - MDM Management Data Provider User Guide
- 241-6001-806 - MDM MDP Data Formats Reference Guide
- NN10600-060 - Nortel Networks Multiservice Switch 7400/15000/20000 Components Reference

## MS2000 Series Node

This section contains IEMS Northbound log samples and device documentation references for the MS2000 Series Node.

### MS2000 Series Node Fault Interface

#### Fault documentation for MS2000 Series Node:

- NN10328-911 MS2000 Fault Management

#### Fault Mapping for MS2000 Series Node

The following criteria can be used for looking up information on specific faults for MS2000 Series Node.

##### Fault Correlation for MS2000 Series Node

| NB format -><br>Device/EM     | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                     |
|-------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------------------|
| <b>MS2000<br/>Series Node</b> | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10328-911<br>MS2000 Fault<br>Management |

### Northbound Fault Formats for MS2000 Series Node

#### SCC2

The following is an example of a MS2000 Series Node log in SCC2 format:

34 AMS 501 0035 INFO MS2000 FAULT

Location: 47.142.134.127

State: Cleared

Time: 1086806097963

\*\*34 AMS 501 0036 FLT MS2000 FAULT

Location: 47.142.134.127

State: Raised

Category: processingError

Cause: 71

Time: 1086806097964

Component Id: System#0

Trap Name: 6

Description: Network element admin state change alarm. Gateway is locked

### NTSTD

The following is an example of a MS2000 Series Node log in NTSTD format:

```
Nortel-JH ** AMS501 JUN10 09:21:12 5707 FLT MS2000 FAULT
```

```
Location: 47.142.134.127
```

```
State: Raised
```

```
Category: processingError
```

```
Cause: 71
```

```
Time: 1086873672171
```

```
Component Id: System#0
```

```
Trap Name: 6
```

```
Description: Network element admin state change alarm. Gateway is shuttingDown
```

```
Nortel-JH AMS501 JUN10 09:21:12 5708 INFO MS2000 FAULT
```

```
Location: 47.142.134.127
```

```
State: Cleared
```

```
Time: 1086873672172
```

Nortel-JH \*\* AMS501 JUN10 09:21:12 5709 FLT MS2000 FAULT

Location: 47.142.134.127

State: Raised

Category: processingError

Cause: 71

Time: 1086873672174

Component Id: System#0

Trap Name: 6

Description: Network element admin state change alarm. Gateway is locked

Nortel-JH AMS501 JUN10 09:21:25 5710 INFO MS2000 FAULT

Location: 47.142.134.127

State: Cleared

Time: 1086873685240

## SNMP

The following is an example of a MS2000 Series Node log in SNMP format:

sysUpTime. => 1 day, 19:19:22

snmpTrapOID. => nnExtAlarmMessage

nnExtAlarmMessageResource => .0.0

nnExtAlarmMessageResourceDescription => IEMS=Unknown Device;

nnExtAlarmMessageDateAndTime => 2004-6-9,3:4:5.0

nnExtAlarmMessageDocumentationPointer => IEMS601

nnExtAlarmMessageInfo => 04 IEMS601 3350 INFO

Location: 10.5.0.17

Event: .1.3.6.1.6.3.1.1.5.3

Varbind0: .1.3.6.1.2.1.2.2.1.1.0: 132

Varbind1: .1.3.6.1.2.1.2.2.1.7.0: 1

Varbind2: .1.3.6.1.2.1.2.2.1.8.0: 2



```

sysUpTime. => 1 day, 19:19:25
snmpTrapOID. => nnExtAlarmMessage
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=Unknown Device;
nnExtAlarmMessageDateAndTime => 2004-6-9,3:4:7.9
nnExtAlarmMessageDocumentationPointer => IEMS601
nnExtAlarmMessageInfo => 04 IEMS601 3351 INFO

```

Location: 10.5.0.17

Event: .1.3.6.1.6.3.1.1.5.4

Varbind0: .1.3.6.1.2.1.2.2.1.1.0: 132

Varbind1: .1.3.6.1.2.1.2.2.1.7.0: 1

Varbind2: .1.3.6.1.2.1.2.2.1.8.0: 1

## Syslog

The following is an example of a MS2000 Series Node log in Syslog format:

```

Jun  9 14:31:41 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=9643~~ AMS501 MAJOR FLT
MS2000 FAULT      Location: 47.142.134.127      State: Raised      Category:
processingError   Cause: 71      Time: 1086805901311      Component Id: System#0
Trap Name: 6      Description: Network element admin state change alarm. Gateway is
shuttingDown

```

```

Jun  9 14:31:41 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=9644~~ AMS501 NONE INFO
MS2000 FAULT      Location: 47.142.134.127      State: Cleared      Time:
1086805901313

```

```

Jun  9 14:31:41 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=9645~~ AMS501 MAJOR FLT
MS2000 FAULT      Location: 47.142.134.127      State: Raised      Category:
processingError   Cause: 71      Time: 1086805901314      Component Id: System#0
Trap Name: 6      Description: Network element admin state change alarm. Gateway is
locked

```

```

Jun  9 14:31:41 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=9646~~ IEMS601 NONE

```

Resetting board

## Performance

### OM and PM Documentation references for MS2000 Series Node

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided.

#### XML

The following is an example of Performance data for MS2000 Series Node in XML format (5-minute collection):

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
  <FileCreationTime>2005-03-24T11:00:02EST</FileCreationTime>
- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="MS2000">
  <EntityId>172.17.40.230</EntityId>
- <SingleValues MeasurementKind="Snapshot" IntervalDuration="5">
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>sysDescr</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.system</MeasureSuppId1>
  <Value>Product: IPmedia 2000;SW Version: 4.60B.003</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpOutPkts</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>144</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
<MeasureId>snmpInBadVersions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInBadCommunityNames</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInTotalReqVars</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>460</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpOutTraps</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>4</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInBadCommunityUses</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInPkts</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>141</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInTotalSetVars</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInASNParseErrs</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>tcpOutSegs</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.tcp</MeasureSuppId1>
  <Value>24</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>tcpInSegs</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.tcp</MeasureSuppId1>
  <Value>7100</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>udpOutDatagrams</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.udp</MeasureSuppId1>
```

```
<Value>156</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>udpInDatagrams</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.udp</MeasureSuppId1>
  <Value>5</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpSilentDrops</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfCpMessageSendErrors</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfCpNumDupsForCompletedTransactions</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
<MeasureId>acPerfCpMessageMaxRetransmissionsExceeded</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>

  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfCpMessageReceiveErrors</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>

  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfCpMessageRetransmissions</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>

  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfCpNumDupsForOutstandingTransactions</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>

  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfCpMessagesFromUntrustedSources</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
```

```
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
<CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
<MeasureId>acPerfCpProtocolSyntaxErrors</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
```

```
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
<CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
<MeasureId>acPerfRtpRcvrLostPackets</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaGateway.acPerfRtp</MeasureSuppId1>
```

```
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
<CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
<MeasureId>acPerfRtpFailedDueToLackOfResources</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaGateway.acPerfRtp</MeasureSuppId1>
```

```
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
<CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
<MeasureId>acPerfIvrPlayCollectRequests</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
```

```
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrPlayRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrPlayCollectFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrPlayFailedDueToProvMismatch</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrContDigitCollectRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
```



```
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrPlayFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrPlayCollectFailedDueToProvMismatch</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfIvrContDigitCollectFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfBctFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfBct</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfBctRequests</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfBct</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
  <MeasureId>acPerfConfRequests</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
  <MeasureId>acPerfConfPortsUsed</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
  <MeasureId>acPerfConfAddFailedDueToLackOfResources</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
```

```
  <MeasureId>acPerfConfFailedDueToLackOfResources</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
```

```

    <Value>0</Value>
    <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfTtFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfTt</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfTtRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfTt</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>acPerfSystemPacketEndpointsInUse</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfSystem</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>

```

## XML

The following is an example of Performance data for MS2000 Series Node in XML format (30-minute collection):

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
  <FileCreationTime>2005-03-24T11:00:04EST</FileCreationTime>
- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="MS2000">
  <EntityId>172.17.40.230</EntityId>
- <SingleValues MeasurementKind="Snapshot" IntervalDuration="30">
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>sysDescr</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.system</MeasureSuppId1>
  <Value>Product: IPmedia 2000;SW Version: 4.60B.003</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpOutPkts</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>145</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInBadVersions</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInBadCommunityNames</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInTotalReqVars</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>469</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpOutTraps</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>4</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInBadCommunityUses</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInPkts</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>142</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>
  <MeasureId>snmpInTotalSetVars</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
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```

- <SingleValue>  
    <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>  
    <MeasureId>snmpInASNParseErrs</MeasureId>  
    <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>  
    <Value>0</Value>  
    <Reliability>Valid</Reliability>  
  </SingleValue>
- <SingleValue>  
    <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>  
    <MeasureId>tcpOutSegs</MeasureId>  
    <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.tcp</MeasureSuppId1>  
    <Value>24</Value>  
    <Reliability>Valid</Reliability>  
  </SingleValue>
- <SingleValue>  
    <CaptureTime>2005-03-24T11:00:01EST</CaptureTime>  
    <MeasureId>tcpInSegs</MeasureId>  
    <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.tcp</MeasureSuppId1>  
    <Value>7100</Value>  
    <Reliability>Valid</Reliability>  
  </SingleValue>
- <SingleValue>  
    <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>  
    <MeasureId>udpOutDatagrams</MeasureId>  
    <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.udp</MeasureSuppId1>  
    <Value>166</Value>  
    <Reliability>Valid</Reliability>  
  </SingleValue>
- <SingleValue>  
    <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>  
    <MeasureId>udpInDatagrams</MeasureId>  
    <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.udp</MeasureSuppId1>  
    <Value>5</Value>  
    <Reliability>Valid</Reliability>  
  </SingleValue>
- <SingleValue>

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<CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
<MeasureId>snmpSilentDrops</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpMessageSendErrors</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpNumDupsForCompletedTransactions</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpMessageMaxRetransmissionsExceeded</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpMessageReceiveErrors</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
```

```
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpMessageRetransmissions</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpNumDupsForOutstandingTransactions</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
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- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpMessagesFromUntrustedSources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfCpProtocolSyntaxErrors</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfCp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
```



```
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfRtpRcvrLostPackets</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfRtp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
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- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfRtpFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfRtp</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfIvrPlayCollectRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfIvrPlayRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
  <MeasureId>acPerfIvrPlayCollectFailedDueToLackOfResources</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
```

```
  <MeasureId>acPerfIvrPlayFailedDueToProvMismatch</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
```

```
  <MeasureId>acPerfIvrContDigitCollectRequests</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
```

```
  <MeasureId>acPerfIvrPlayFailedDueToLackOfResources</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
```

```
  <Value>0</Value>
```

```
  <Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
  <CaptureTime>2005-03-24T11:00:02EST</CaptureTime>
```

```
  <MeasureId>acPerfIvrPlayCollectFailedDueToProvMismatch</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo  
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
```

```
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<Reliability>Valid</Reliability>
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  <MeasureId>acPerfIvrContDigitCollectFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfIvr</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfBctFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfBct</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfBctRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfBct</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfConfRequests</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
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```

```
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfConfPortsUsed</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfConfAddFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfConfFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfConf</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
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- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfTtFailedDueToLackOfResources</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfTt</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfTtRequests</MeasureId>
```

```

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaServices.acPerfTt</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-24T11:00:04EST</CaptureTime>
  <MeasureId>acPerfSystemPacketEndpointsInUse</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.audioCodes.acPerfo
rmances.acPerfMediaGateway.acPerfSystem</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>

```

## CSV

The following is an example of Performance data for MS2000 Series Node in CSV format (5-minute collection):

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

172.17.40.230,MS2000

SingleValues=Begin

MeasurementKind,IntervalDuration

Snapshot,5

MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability

sysDescr,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.system,Product: IPmedia 2000;SW Version: 4.60B.003,Valid

snmpOutPkts, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 144, Valid

snmpInBadVersions, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 0, Valid

snmpInBadCommunityNames, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 0, Valid

snmpInTotalReqVars, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 460, Valid

snmpOutTraps, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 4, Valid

snmpInBadCommunityUses, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 0, Valid

snmpInPkts, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 141, Valid

snmpInTotalSetVars, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 0, Valid

snmpInASNParseErrs, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 0, Valid

tcpOutSegs, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.tcp, 24, Valid

tcpInSegs, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.tcp, 7100, Valid

udpOutDatagrams, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.udp, 156, Valid

udpInDatagrams, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.udp, 5, Valid

snmpSilentDrops, 2005-03-24T11:00:01EST, .iso.org.dod.internet.mgmt.mib-2.snmp, 0, Valid

acPerfCpMessageSendErrors, 2005-03-24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerformances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpNumDupsForCompletedTransactions, 2005-03-24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerformances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessageMaxRetransmissionsExceeded, 2005-03-24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerformances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessageReceiveErrors, 2005-03-24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerformances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessageRetransmissions, 2005-03-24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerformances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpNumDupsForOutstandingTransactions, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessagesFromUntrustedSources, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpProtocolSyntaxErrors, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfRtpRcvrLostPackets, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfRtp, 0, Valid

acPerfRtpFailedDueToLackOfResources, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfRtp, 0, Valid

acPerfIvrPlayCollectRequests, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayRequests, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayCollectFailedDueToLackOfResources, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayFailedDueToProvMismatch, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrContDigitCollectRequests, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayFailedDueToLackOfResources, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayCollectFailedDueToProvMismatch, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrContDigitCollectFailedDueToLackOfResources, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfBctFailedDueToLackOfResources, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfBct, 0, Valid

acPerfBctRequests, 2005-03-  
24T11:00:01EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfBct, 0, Valid

```
acPerfConfRequests,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfConfPortsUsed,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfConfAddFailedDueToLackOfResources,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfConfFailedDueToLackOfResources,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfTtFailedDueToLackOfResources,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfTt,0,Valid

acPerfTtRequests,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfTt,0,Valid

acPerfSystemPacketEndpointsInUse,2005-03-
24T11:00:01EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaGateway.acPerfSystem,0,Valid

SingleValues=End
```

Entity=End

System=End

PMFile=End

### CSV

The following is an example of Performance data for MS2000 Series Node in CSV format (30-minute collection):

```
PMFile=Begin
MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime
PM,commonFormat.xsd,2005-03-24T11:00:04EST

System=Begin
SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId,Type
```



172.17.40.230,MS2000

SingleValues=Begin

MeasurementKind,IntervalDuration

Snapshot,30

MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability

sysDescr,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.system,Product: IPmedia 2000;SW Version: 4.60B.003,Valid

snmpOutPkts,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,145,Valid

snmpInBadVersions,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,0,Valid

snmpInBadCommunityNames,2005-03-  
24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid

snmpInTotalReqVars,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,469,Valid

snmpOutTraps,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,4,Valid

snmpInBadCommunityUses,2005-03-  
24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid

snmpInPkts,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,142,Valid

snmpInTotalSetVars,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,0,Valid

snmpInASNParseErrs,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,0,Valid

tcpOutSegs,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.tcp,24,Valid

tcpInSegs,2005-03-24T11:00:01EST,.iso.org.dod.internet.mgmt.mib-  
2.tcp,7100,Valid

udpOutDatagrams,2005-03-24T11:00:02EST,.iso.org.dod.internet.mgmt.mib-  
2.udp,166,Valid

udpInDatagrams,2005-03-24T11:00:02EST,.iso.org.dod.internet.mgmt.mib-  
2.udp,5,Valid

snmpSilentDrops,2005-03-24T11:00:02EST,.iso.org.dod.internet.mgmt.mib-  
2.snmp,0,Valid

acPerfCpMessageSendErrors,2005-03-  
24T11:00:02EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor-  
mances.acPerfMediaGateway.acPerfCp,0,Valid

acPerfCpNumDupsForCompletedTransactions,2005-03-  
24T11:00:02EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor-  
mances.acPerfMediaGateway.acPerfCp,0,Valid

acPerfCpMessageMaxRetransmissionsExceeded, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessageReceiveErrors, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessageRetransmissions, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpNumDupsForOutstandingTransactions, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpMessagesFromUntrustedSources, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfCpProtocolSyntaxErrors, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfCp, 0, Valid

acPerfRtpRcvrLostPackets, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfRtp, 0, Valid

acPerfRtpFailedDueToLackOfResources, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaGateway.acPerfRtp, 0, Valid

acPerfIvrPlayCollectRequests, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayRequests, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayCollectFailedDueToLackOfResources, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayFailedDueToProvMismatch, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrContDigitCollectRequests, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayFailedDueToLackOfResources, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

acPerfIvrPlayCollectFailedDueToProvMismatch, 2005-03-  
24T11:00:02EST, .iso.org.dod.internet.private.enterprises.audioCodes.acPerfor  
mances.acPerfMediaServices.acPerfIvr, 0, Valid

```
acPerfIvrContDigitCollectFailedDueToLackOfResources,2005-03-
24T11:00:02EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfIvr,0,Valid

acPerfBctFailedDueToLackOfResources,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfBct,0,Valid

acPerfBctRequests,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfBct,0,Valid

acPerfConfRequests,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfConfPortsUsed,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfConfAddFailedDueToLackOfResources,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfConfFailedDueToLackOfResources,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfConf,0,Valid

acPerfTtFailedDueToLackOfResources,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfTt,0,Valid

acPerfTtRequests,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaServices.acPerfTt,0,Valid

acPerfSystemPacketEndpointsInUse,2005-03-
24T11:00:04EST,.iso.org.dod.internet.private.enterprises.audioCodes.acPerfor
mances.acPerfMediaGateway.acPerfSystem,0,Valid

SingleValues=End
```

Entity=End

System=End

PMFile=End

## GUI/CLUI Documentation for MS2000 Series Node

### GUI Launching and User procedures

- NN10323-111 MS2000 Basics

### Related documents

- NN10340-511 MS2000 Configuration
- NN10337-611 MS2000 Security

## Session Server Manager

This section contains IEMS Northbound log samples and device documentation references for the Session Server Manager.

### Session Server Manager Fault Interface

This section will provide references to customer documentation for Fault, Performance, Topology, GUI/CLUI, and Security for Session Server Manager.

#### Fault documentation for Session Server Manager:

- NN10322-911 - Session Server Manager Fault Management

#### Fault Mapping for Session Server Manager

The following criteria can be used for looking up information on specific faults for Session Server Manager.

#### Fault Correlation for Session Server Manager

| NB format -><br>Device/EM     | SCC2               | NTSTD              | SNMP               | Syslog             | Document Reference                                     |
|-------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------------------------------------------|
| <b>Session Server Manager</b> | logname and number | logname and number | logname and number | logname and number | NN10322-911<br>Session Server Manager Fault Management |

### Northbound Fault Formats for Session Server Manager

#### SCC2

The following is an example of a Session Server Manager log in SCC2 format:

```
**57 SIPM302 2080 FLT SIPM Fault
Location: 47.142.123.43
Notification Id: 111
State: Raised
Category: communications
Cause: applicationSubsystemFailure
Time: Apr 12 21:57:55 2004
Component Id: NCGL=RTPF-SIP0;Unit=0;
Specific Problem: SIP Gateway Application State Not Synced With Mate
Description: SIP Gateway Application Mtc Out Of Sync
```

## NTSTD

The following is an example of a Session Server Manager log in NTSTD format:

```
znc0s0jh  ** SIPM302 APR12 21:57:55 2080 FLT  SIPM Fault
Location: 47.142.123.43
Notification Id: 111
State: Raised
Category: communications
Cause: applicationSubsystemFailure
Time: Apr 12 21:57:55 2004
Component Id: NCGL=RTPF-SIP0;Unit=0;
Specific Problem: SIP Gateway Application State Not Synced With Mate
Description: SIP Gateway Application Mtc Out Of Sync
```

## SNMP

The following is an example of a Session Server Manager log in SNMP format:

```
sysUpTime.0 => 2:34:22
snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
20.50.48.48.52.45.52.45.49.50.44.57.58.53.55.58.53.53.46.48.44.3070
alarmActiveDateAndTime => 2004-4-12,9:57:55.0
alarmActiveDescription => SIP Gateway Application Mtc Out Of Sync
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 2
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => SIPM302
nnExtAlarmActiveResourceDescription => IEMS=47.142.123.48-SP2000-Unit-
0;NCGL=RTPFSIP0;
Unit=0;
nnExtAlarmActiveManualClear => 2
nnExtAlarmActiveSequenceNumber => 35
```

## Syslog

The following is an example of a Session Server Manager log in Syslog format:

Apr 12 22:13:03 znc0s0jh IEMS: V2\_~I=~H=znc0s0jh~A=IEMS~S=6213~~ SIPM302 MAJOR FLT  
 SIPM Fault^M Locationon:47.142.123.43^M Notification Id: 111^M State:  
 Raised^M Category: communications^M Cause: applicationSubsystemFailure^M  
 Time: Apr 12 21:57:55 2004^M Component Id: NCGL=RTPF-SIP0;Unit=0;^M Specific  
 Problem: SIP Gateway Application State Not Synced With Mate^M Description: SIP  
 Gateway Application Mtc Out Of Sync

## Performance

### OM and PM Documentation references for Session Server Manager

- NN10342-711 Session Server Manager Performance Management

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided.

#### XML

The following is an example of Performance for Session Server Manager in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
_ <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
<FileCreationTime>2004-06-23T17:40:13EST</FileCreationTime>
_ <System>
<SystemId>NortelNetworks/IEMS</SystemId>
_ <Entity Type="Session Server">
<EntityId>47.174.74.179</EntityId>
_ <SingleValues MeasurementKind="Snapshot" IntervalDuration="5">
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:00EST</CaptureTime>
<MeasureId>sysDescr</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.system</MeasureSuppId1>
<Value>Linux sp2k-1 2.4.22-samxts #1 Thu May 13 01:48:09 EDT 2004 i686</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:00EST</CaptureTime>
<MeasureId>snmpOutPkts</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>8679</Value>
```

```
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:00EST</CaptureTime>
<MeasureId>snmpInBadVersions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:01EST</CaptureTime>
<MeasureId>snmpInBadCommunityNames</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>1</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:01EST</CaptureTime>
<MeasureId>snmpInTotalReqVars</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>9899</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:01EST</CaptureTime>
<MeasureId>snmpOutTraps</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:01EST</CaptureTime>
<MeasureId>snmpInBadCommunityUses</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
```

```
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:02EST</CaptureTime>
<MeasureId>snmpInPkts</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>8692</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:02EST</CaptureTime>
<MeasureId>snmpInTotalSetVars</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:02EST</CaptureTime>
<MeasureId>snmpInASNParseErrs</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:02EST</CaptureTime>
<MeasureId>hrSystemDate</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:03EST</CaptureTime>
<MeasureId>hrSystemUptime</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem</MeasureSuppId1>
<Value>1316119</Value>
<Reliability>Valid</Reliability>
```



```

</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:03EST</CaptureTime>
<MeasureId>hrSystemProcesses</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem</MeasureSuppId1>
<Value>170</Value>
<Reliability>Valid</Reliability>
</SingleValue>
_ <SingleValue>
<CaptureTime>2004-06-23T17:35:03EST</CaptureTime>
<MeasureId>snmpSilentDrops</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.snmp</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>

```

## CSV

The following is an example of Performance for Session Server Manager in CSV format:

```

PMFile=Begin
PM,commonFormat.xsd,2004-06-23T20:35:30EST
System=Begin
NortelNetworks/IEMS
Entity=Begin
47.174.74.179,Session Server
SingleValues=Begin
Snapshot,5
sysDescr,2004-06-23T20:30:01EST,.iso.org.dod.internet.mgmt.mib-
2.system,Linux sp2k-1 2.4.22-samxts #1 Thu May 13 01:48:09 EDT 2004 i686,Valid
snmpOutPkts,2004-06-23T20:30:01EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,9342,Valid

```

```
snmpInBadVersions,2004-06-23T20:30:02EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid

snmpInBadCommunityNames,2004-06-
23T20:30:02EST,.iso.org.dod.internet.mgmt.mib-2.snmp,1,Valid

snmpInTotalReqVars,2004-06-23T20:30:02EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,13190,Valid

snmpOutTraps,2004-06-23T20:30:02EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid

snmpInBadCommunityUses,2004-06-
23T20:30:02EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid

snmpInPkts,2004-06-23T20:30:03EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,9355,Valid

snmpInTotalSetVars,2004-06-23T20:30:03EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid

snmpInASNParseErrs,2004-06-23T20:30:03EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid

hrSystemDate,2004-06-23T20:30:04EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,0,Valid

hrSystemUptime,2004-06-23T20:30:04EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,1326620,Valid

hrSystemProcesses,2004-06-23T20:30:04EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,170,Valid

SingleValues=End

Entity=End

System=End

PMFile=End
```

## GUI/CLUI Documentation for Session Server Manager

### GUI Launching and User procedures

- NN10333-111 Session Server Manager Basics

### Related documents

- NN10338-511 - Session Server Manager configuration
- NN10346-611 - Session Server Manager Security and Administration

## SAM21 Shelf Controller

This section contains IEMS Northbound log samples and device documentation references for the SAM21 Shelf Controller.

### SAM21 Shelf Controller Fault Interface

#### Fault documentation for SAM21 Shelf Controller:

- NN10089-911 - SAM21 Shelf Controller Fault Management

#### Fault Mapping for SAM21 Shelf Controller

The following criteria can be used for looking up information on specific faults for SAM21 Shelf Controller.

#### Fault Correlation for SAM21 Shelf Controller

| NB format -><br>Device/EM     | SCC2               | NTSTD              | SNMP               | Syslog             | Document Reference                                     |
|-------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------------------------------------------|
| <b>SAM21 Shelf Controller</b> | logname and number | logname and number | logname and number | logname and number | NN10089-911<br>SAM21 Shelf Controller Fault Management |

### Northbound Fault Formats for SAM21 Shelf Controller

#### SCC2

The following is an example of a SAM21 Shelf Controller log in SCC2 format:

```
**37 SCU 350 0009 FLT Alarm Raised
Location: SAM21 1:CSAM01-01:sled 3
Time: Wed Jan 14 13:55:52 EST 2004
Reason: Temperature in Sled 3 is high
```

#### NTSTD

The following is an example of a SAM21 Shelf Controller log in NTSTD format:

```
COMPACT06BT ** SCU350 Jan15 00:37:17 0009 FLT Alarm Raised
```

```
Location: SAM21 1:CSAM01-01:sled 3
Time:      Wed Jan 14 13:55:52 EST 2004
Reason:    Temperature in Sled 3 is high
```

## SNMP

The following is an example of a SAM21 Shelf Controller log in SNMP format:

```
sysUpTime.0 => 9:14:20
snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.49.44.54.58.52.49.58.49.52.46.48.44.8995
alarmActiveDateAndTime => 2004-1-21,6:41:14.0,
alarmActiveDescription => Temperature in Sled 3 is high.
Time:      Wed Jan 14 13:57:48 EST 2004
Reason:    Temperature in Sled 3 is high
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => SCU 350
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0kz.us.nortel.com-SAM21-Mgr;
nnExtAlarmActiveManualClear => 2
nnExtAlarmActiveSequenceNumber => 1
```

## Syslog

The following is an example of a SAM21 Shelf Controller log in Syslog format:

```
Feb 12 18:30:19 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=7929~~ SCU350 MAJOR FLT
Alarm Raised^M      Location: SAM21 1:CSAM01-01:sled 3^M      Time:      Mon Jan 12
12:49:06 EST 2004^M      Reason:    Temperature in Sled 3 is high
```

## Performance

### OM and PM Documentation references for SAM21 Shelf Controller

- There are no OMs or PMs associated with this device.

## Northbound OM/PM Formats

Not applicable.

### CSV

Not applicable.

***Note:** The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for SAM21 Shelf Controller

### GUI Launching and User procedures

- NN10025-111 - SAM21 Shelf Controller Basics
- NN10089-911 - SAM21 Shelf Controller Fault Management
- NN10111-511 - SAM21 Shelf Controller Configuration Management
- NN10177-611 - SAM21 Shelf Controller Administration and Security
- NN10155-711 - SAM21 Shelf Controller Performance Management

### Related documents

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics

## Storage Manager (STORM)

This section contains IEMS Northbound log samples and device documentation references for the STORM.

### STORM Fault Interface

#### Fault documentation for STORM:

- NN10024-111 - STORM Basics
- NN10088-911 - STORM Fault Management

#### Fault Mapping for STORM

The following criteria can be used for looking up information on specific faults for STORM.

**Fault Correlation for STORM**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>                            | <b>NTSTD</b>          | <b>SNMP</b>           | <b>Syslog</b>         | <b>Document<br/>Reference</b>            |
|--------------------------------------|----------------------------------------|-----------------------|-----------------------|-----------------------|------------------------------------------|
| <b>STORM</b>                         | logname and<br>number<br>e.g.: STM 800 | logname and<br>number | logname and<br>number | logname and<br>number | NN10088-911<br>STORM Fault<br>Management |

**Northbound Fault Formats for STORM****SCC2**

The following is an example of a STORM log in SCC2 format:

***Sample Clear:***

```
19 STM 801 0595 INFO
    Location: 47.166.56.10
    Notification Id: 13
    State: Cleared
    Time: Jan 24 19:19:49 2004
```

***Sample Raise:***

```
**19 STM 801 0596 FLT STM Fault
    Location: 47.166.56.10
    Notification Id: 14
    State: Raised
    Category: qualityOfService
    Cause: thresholdCrossed
    Time: Jan 24 19:19:49 2004
    Component Id: STORMIA=langley1
    Specific Problem:
    Description: Status: Alarm raised. Used memory percentage is 18.24. Major alarm threshold value is 6.00.
```

**NTSTD**

The following is an example of a STORM log in NTSTD format:

***Sample Clear:***

```
RTPU07BR      STM801 Jan25 00:19:49 0041 INFO
    Location: 47.166.56.10
```

Notification Id: 13  
State: Cleared  
Time: Jan 24 19:19:49 2004

### ***Sample Raise:***

RTPU07BR \*\* STM801 Jan25 00:19:49 0042 FLT STM Fault  
Location: 47.166.56.10  
Notification Id: 14  
State: Raised  
Category: qualityOfService  
Cause: thresholdCrossed  
Time: Jan 24 19:19:49 2004  
Component Id: STORMIA=langley1  
Specific Problem:  
Description: Status: Alarm raised. Used memory percentage is 18.24. Major alarm threshold value is 6.00.

## **SNMP**

The following is an example of a STORM log in SNMP format:

### ***Sample Clear:***

**system.sysUpTime.0 =>** 8:01:55  
**snmpTrapOID.0 =>** nnExtAlarmClear  
**alarmActiveResourceId =>**  
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48  
.48.52.45.49.45.50.52.44.55.58.49.57.58.52.57.46.48.44.312  
**alarmActiveDateAndTime =>** 2004-1-21,6:41:14.0,  
**alarmActiveDescription =>** Alarm cleared. A new alarm with higher severity will be raised.  
**nnExtAlarmActiveEventType =>** 2  
**nnExtAlarmActiveProbableCause =>** 118  
**nnExtAlarmActiveAdditionalText =>**  
**nnExtAlarmActiveDocumentationPointer =>** STM 801  
**nnExtAlarmActiveResourceDescription =>** IEMS=zmdhh0jk.europe.nortel.com-STORM;STORMIA=langley1  
**nnExtAlarmActiveSequenceNumber =>** 24

### ***Sample Raise:***

**system.sysUpTime.0 =>** 7:01:55  
**snmpTrapOID.0 =>** nnExtAlarmMajor

```

alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.52.44.55.58.49.57.58.52.57.46.48.44.329

alarmActiveDateAndTime => 2004-1-21,6:41:14.0,

alarmActiveDescription => Alarm raised. Used memory percentage is 18.24. Major alarm
threshold value is 6.00.

nnExtAlarmActiveEventType => 2

nnExtAlarmActiveProbableCause => 51

nnExtAlarmActiveAdditionalText =>

nnExtAlarmActiveDocumentationPointer => STM 801

nnExtAlarmActiveResourceDescription => IEMS=zmdhh0jk.europe.nortel.com-
STORM;STORMIA=langley1

nnExtAlarmActiveManualClear => 2

nnExtAlarmActiveSequenceNumber => 25

```

## Syslog

The following is an example of a STORM log in Syslog format:

### *Sample Clear:*

```

Feb 24 19:19:43 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0618~~ STM801 NONE INFO
^M      Location: 47.166.56.10^M      Notification Id: 13^M      State: Cleared^M
Time: Jan 24 19:19:49 2004

```

### *Sample Raise:*

```

Feb 24 19:19:43 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0619~~ STM801 MAJOR FLT
STM Fault^M      Location: 47.166.56.10^M      Notification Id: 14^M      State:
Raised^M      Category: qualityOfService^M      Cause: thresholdCrossed^M      Time:
Jan 24 19:19:49 2004^M      Component Id: STORMIA=langley1^M      Specific Problem:
^M      Description: Status: Alarm raised. Used memory percentage is 18.24. Majo^M
r alarm threshold value is 6.00.

```

## Performance

### OM and PM Documentation references for STORM

The SNMP based attributes that can be collected from the STORM device are documented in:

- NN10054-711 - STORM Performance Management Customer Document

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided.



## XML

The following is an example of Performance data for STORM in XML format:

```
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- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
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- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="STORM">
  <EntityId>47.166.56.10</EntityId>
- <Table MeasurementKind="Snapshot" IntervalDuration="5">
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2.host.hrStorage.hrStorageTable.hrStorageEntry</TableId>
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```

```

    <CaptureTime>2005-03-15T15:25:00EST</CaptureTime>
    <MeasureId>hrSystemDate</MeasureId>
    <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem</MeasureSuppId1>
    <Value>2005-3-15,20:25:0.0,+0:0</Value>
    <Reliability>Valid</Reliability>
  </SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-15T15:25:00EST</CaptureTime>
  <MeasureId>hrSystemUptime</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem</MeasureSuppId1>
  <Value>1641630</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-03-15T15:25:00EST</CaptureTime>
  <MeasureId>hrSystemProcesses</MeasureId>
  <MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem</MeasureSuppId1>
  <Value>79</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>

```

## CSV

The following is an example of Performance data for STORM in CSV format:

```

PMFile=Begin
MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime
PM,commonFormat.xsd,2005-03-15T15:00:04EST

System=Begin
SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId,Type

```



47.166.56.10, STORM

Table=Begin

TableId, MeasurementKind, IntervalDuration, CaptureTime

.iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTable.hrStorageEntry, Snapshot, 5, 2005-03-15T15:00:01EST

Label, Label, Label, Label, Label, Label, Label

hrStorageIndex, hrStorageType, hrStorageDescr, hrStorageAllocationUnits, hrStorageSize, hrStorageUsed, hrStorageAllocationFailures

Value, Value, Value, Value, Value, Value, Value

14, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/5/cs, 4096, 924496, 591998, 0

13, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/4/mtc, 4096, 260944, 71425, 0

12, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/4/cs, 4096, 924496, 505263, 0

11, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/3/mtc, 4096, 260944, 66722, 0

10, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/3/cs, 4096, 924496, 486565, 0

103, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageOther, Memory Buffers, 256, 53469, 0, 1026

102, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageVirtualMemory, Swap Space, 1024, 0, 0, 1025

101, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageRam, Real Memory, 1024, 514140, 381096, 769

22, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/8/mtc, 4096, 260944, 39831, 0

21, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/8/cs, 4096, 875344, 639076, 0

9, .iso.org.dod.internet.mgmt.mib-

2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk, /nfsserv/3pc/2/mtc, 4096, 260944, 41533, 0

```
20,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/7/mtc,4096,2
60944,37870,0

8,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/2/cs,4096,92
4496,627594,0

7,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/1/mtc,4096,2
60944,64172,0

6,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/1/cs,4096,92
4496,484559,0

5,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/0/mtc,4096,2
60944,41691,0

4,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/0/cs,4096,92
4496,667345,0

3,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/storm,4096,260944,298,0

2,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/boot,1024,101018,58993,0

1,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/,1024,59301,53469,0

19,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/7/cs,4096,87
5344,551564,0

18,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/6/mtc,4096,2
60944,41894,0

17,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/6/cs,4096,87
5344,600004,0

16,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/usp,4096,514896,
13886,0

15,.iso.org.dod.internet.mgmt.mib-
2.host.hrStorage.hrStorageTypes.hrStorageFixedDisk,/nfsserv/3pc/5/mtc,4096,2
60944,37447,0

Table=End
```

SingleValues=Begin

MeasurementKind,IntervalDuration

Snapshot,5

```
MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability
sysDescr,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.system,Linux langley40 2.4.19-xfs #1 SMP Fri Nov 7 11:18:05 EST 2003
i686,Valid
snmpOutPkts,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,105803,Valid
snmpInBadVersions,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid
snmpInBadCommunityNames,2005-03-
15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-2.snmp,7,Valid
snmpInTotalReqVars,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,558666,Valid
snmpOutTraps,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,13396,Valid
snmpInBadCommunityUses,2005-03-
15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-2.snmp,0,Valid
snmpInPkts,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,96979,Valid
snmpInTotalSetVars,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid
snmpInASNParseErrs,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid
snmpSilentDrops,2005-03-15T15:00:00EST,.iso.org.dod.internet.mgmt.mib-
2.snmp,0,Valid
hrSystemDate,2005-03-15T15:00:01EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,2005-3-15,20:0:1.0,+0:0,Valid
hrSystemUptime,2005-03-15T15:00:01EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,1640131,Valid
hrSystemProcesses,2005-03-15T15:00:01EST,.iso.org.dod.internet.mgmt.mib-
2.host.hrSystem,80,Valid
SingleValues=End

Entity=End

System=End

PMFile=End
```

## GUI/CLUI Documentation for STORM

### GUI Launching and User procedures

- NN10024-111 (STORM Basics)

### Related documents

- NN10066-461 (Understanding STORM)
- NN10110-511 (STORM Configuration)
- NN10054-711 (STORM Performance)
- NN10176-611 (STORM Administration and Security)

## Universal Audio Server (UAS)

This section contains IEMS Northbound log samples and device documentation references for the UAS.

### UAS Fault Interface

#### Fault documentation for UAS:

- NN10073-911 UAS Fault Management

#### Fault Mapping for UAS

The following criteria can be used for looking up information on specific faults for UAS.

##### Fault Correlation for UAS

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                  |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------------------|
| UAS                       | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10073-911<br>UAS Fault<br>Management |

### Northbound Fault Formats for UAS

#### SCC2

The following is an example of a UAS log in SCC2 format:

```
*C59 UAS 301 0723 TBL UAS Fault
    Location: UAS12_Test
    NotificationID: 2109441
    State: Raise
    Category: Processing Error
    Cause: Software error
    Time: Jan 22 15:41:28 2004
    Component Id: UAS;UASUnit=MATTA-2;Software=Call_Engine_1
    Specific Problem: 12289
    Description: CallEngine test alarm critical number 1
```

## NTSTD

The following is an example of a UAS log in NTSTD format:

```
COMPACT506BT *** UAS301 Jan22 20:59:00 1149 TBL UAS Fault
    Location: UAS12_Test
    NotificationID: 2109441
    State: Raise
    Category: Processing Error
    Cause: Software error
    Time: Jan 22 15:41:28 2004
    Component Id: UAS;UASUnit=MATTA-2;Software=Call_Engine_1
    Specific Problem: 12289
    Description: CallEngine test alarm critical number 1
```

## SNMP

The following is an example of a UAS log in SNMP format:

```
sysUpTime.0 => 3:21:08
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.11
6.19.50.48.48.52.45.49.45.50.50.44.51.58.53.57.58.48.46.52.44.28556
alarmActiveDateAndTime => 2004-1-22,3:59:0.4,
alarmActiveDescription => CallEngine test alarm critical number 1
NotificationID: 2109441
State: Raise
```

Category: Processing Error

Cause: Software error

Time: Jan 22 15:41:28 2004

Component Id: UAS;UASUnit=MATTA-2;Software=Call\_Engine\_1

Specific Problem: 12289

Description: CallEngine test alarm critical number 1

## Syslog

The following is an example of a UAS log in Syslog format:

```
Jan 22 15:59:00 znc0s0jh IEMS: _V2_~I=~H=znc0s0jh~A=IEMS~S=3086~~ UAS301 CRIT TBL UAS
Fault^M      Location: UAS12_Test^M      NotificationID: 2109441^M      State:
Raise^M      Category: Processing Error^M      Cause: Software error^M      Time:
Jan 22 15:41:28 2004^M      Component Id: UAS;UASUnit=MATTA-
2;Software=Call_Engine_1^M      Specific Problem: 12289^M      Description:
CallEngine test alarm critical number 1
```

## Performance

### OM and PM Documentation references for UAS

- NTP NN10139-001 UAS Performance

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided  
each of the Northbound formats provided

## XML

The following is an example of performance data for UAS in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
<FileCreationTime>2005-01-13T14:15:01EST</FileCreationTime>
<System>
<SystemId>NortelNetworks/IEMS</SystemId>
<Entity Type="UAS">
<EntityId>47.142.89.82</EntityId>
<Table MeasurementKind="Snapshot" IntervalDuration="5">
<TableId>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUasResourc
eManagerObjects.norUasRequestStatsTable.norUasRequestStatsEntry</TableId>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<Labels>
<Label>norUasResourceName</Label>
<Label>norUasRequestCount</Label>
<Label>norUasRequestsFailed</Label>
</Labels>
<RowOfValues>
<RowValue>
```

```
<Value>EndpointIdPool5</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>EndpointIdPool4</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>EndpointIdPool3</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>EndpointIdPool2</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>EndpointIdPool1</Value>
</RowValue>
<RowValue>
<Value>4</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>EndpointIdPool0</Value>
</RowValue>
<RowValue>
<Value>103</Value>
</RowValue>
<RowValue>
<Value>0</Value>
</RowValue>
</RowOfValues>
```

```
</Table>
<SingleValues MeasurementKind="Snapshot" IntervalDuration="5">
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasMgcpMessageRetransmissionFailures</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>3771</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasAckfail</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasProterror</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasAudioSegmentFailed</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasCompererror</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasProtocolSyntaxErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:01EST</CaptureTime>
<MeasureId>norUasNumberOfPlayRecordErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
IVRServiceObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasConfLackOfResourceRejections</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
ConfServiceObjects</MeasureSuppId1>
<Value>0</Value>
```



```
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasConfTotal</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
ConfServiceObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasConfPlays</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
ConfServiceObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:01EST</CaptureTime>
<MeasureId>norUasNumberOfPlayRecords</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
IVRServiceObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasRestart</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasConndeleted</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasProtocolMessageValidationErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasUdpReceiveErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>10</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasNumDupsForOutstandingTransactions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasEndpointsInUse</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasTimeout</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>1256</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasNumDupsForCompletedTransactions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>3</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasUdpSendErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasCallControlMessageSendFailures</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>1257</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasMgcpMessageRetransmissions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>3771</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2005-01-13T14:15:00EST</CaptureTime>
<MeasureId>norUasAudioSegmentPlayed</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUas
CallEngineObjects</MeasureSuppId1>
<Value>134</Value>
<Reliability>Valid</Reliability>
</SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>
```

## CSV

The following is an example of performance data for UAS in CSV format:

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime

PM,commonFormat.xsd,2005-02-09T15:30:20EST

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

47.142.89.80,UAS

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUasResourceManagerObjects.norUasRequestStatsTable.norUasRequestStatsEntry,Snapshot,30,2005-02-09T15:30:17EST

Label,Label,Label

norUasResourceName,norUasRequestCount,norUasRequestsFailed

Value,Value,Value

EndpointIdPool3,0,0

EndpointIdPool2,0,0

EndpointIdPool1,0,0

EndpointIdPool0,0,0

Table=End

SingleValues=Begin

MeasurementKind,IntervalDuration

Snapshot,30

MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability

norUasUdpSendErrors,2005-02-

09T15:30:02EST,.iso.org.dod.internet.private.enterprises.nortel.voip.uas.norUasCallEngineObjects,0,Valid

norUasNumDupsForCompletedTransactions,2005-02-  
09T15:30:02EST,.iso.org.dod.internet.private.enterprises.nortel.voip.uas.nor  
UasCallEngineObjects,0,Valid

norUasCallControlMessageSendFailures,2005-02-  
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## **GUI/CLUI Documentation for UAS**

### **GUI Launching and User procedures**

- NTP NN10047-461 UAS Basics

### **Related documents**

- NTP NN10095-511 UAS Configuration
- NTP NN10161-611 UAS Security
- NTP NN10047-461 UAS Upgrades

## Universal Signaling Point (USP)

This section contains IEMS Northbound log samples and device documentation references for the USP.

### USP Fault Interface

#### Fault documentation for USP:

- NN10071-911 - USP Fault Management
- NN10072-911 - USP-Compact Fault Management

#### Fault Mapping for USP

The following criteria can be used for looking up information on specific faults for USP.

##### Fault Correlation for USP

| NB format -> Device/EM | SCC2                                                                                          | NTSTD                                                                                         | SNMP                                                                                            | Syslog                                                                                        | Document Reference                     |
|------------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------|
| <b>USP</b>             | Specific Problem: Log Group=<text> & Log Number=<number><br><br>Note: Log GroupID is not used | Specific Problem: Log Group=<text> & Log Number=<number><br><br>Note: Log GroupID is not used | Refer to the .1.3.6.1.4.1.5 62.29.6.1.1.1 .3 varbind: Log Group =<text> & Log Number =<number>. | Specific Problem: Log Group=<text> & Log Number=<number><br><br>Note: Log GroupID is not used | NN10071911<br><br>USP Fault Management |

**Note:** All USP alarm raise events are mapped to a USP398 event in the IEMS. In addition, all USP alarm clear events are mapped to a USP399. Refer to the USP device documentation for a detailed description of these events.

### Northbound Fault Formats for USP

#### SCC2

The following is an example of a USP log in SCC2 format:

```
**10 USP 398 0022 FLT  USP Fault
Location: 47.135.60.201
Notification Id: 526
State: Raised
Category: processingError
```

Cause: applicationSubsystemFailure(2)  
Time: Jan 20 07:10:29 2004  
Component Id: USP=autoimage;Shelf=0;Slot=15;ContextID=0x0  
Specific Problem: Log GroupID=13;Log Group=System Node Maintenance;Log Number=3  
Description: Transition to DISABLED Operational State.

## NTSTD

The following is an example of a USP log in NTSTD format:

znc0s0jh \* USP398 FEB17 01:09:59 0010 FLT USP Fault

Location: 47.142.87.127-Unit-0;47.142.87.127

Notification Id: 1034

State: Raised

Category: communications

Cause: communicationsSubsystemFailure

Time: Feb 17 01:09:59 2006

Component Id: USP=COMP4;Shelf=0;Slot=12;ContextID=0x1010101

Specific Problem: Log GroupID=32;Log Group=Network;Log Number=0

Description: Connectivity lost: 1 1.1.1.1

znc0s0jh USP399 FEB17 01:10:21 0011 INFO USP Fault

Location: 47.142.87.127-Unit-0;47.142.87.127

Notification Id: 1029

State: Cleared

Time: Feb 17 01:10:21 2006

Component Id: USP=COMP4;Shelf=0;Slot=15;ContextID=0x1010101

Description: netping entry deleted: 1 1.1.1.1

## SNMP

The following is an example of a USP log alarm raise and log alarm clear in SNMP format:

USP 398: Alarm Raise

.1.3.6.1.2.1.1.3.0: TimeTicks: 2 hours, 13 minutes, 19 seconds.:

```
.1.3.6.1.6.3.1.1.4.1.0: Object ID: .1.3.6.1.4.1.562.29.6.1.0.303:
.1.3.6.1.2.1.118.1.2.2.1.10: Object ID:
.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.28.50.4
8.48.54.45.48.50.45.49.55.44.48.49.58.48.57.58.53.57.46.48.44.45.48.53.58.48.48.2
80155:
.1.3.6.1.2.1.118.1.2.2.1.2: 07 d6 02 11 01 09 3b 00 2d 05 00:
.1.3.6.1.2.1.118.1.2.2.1.11: STRING: Connectivity lost: 1 1.1.1.1:
.1.3.6.1.4.1.562.29.6.1.1.1.1: INTEGER: 2:
.1.3.6.1.4.1.562.29.6.1.1.1.2: INTEGER: 505:
.1.3.6.1.4.1.562.29.6.1.1.1.3: STRING: Log GroupID=32;Log Group=Network;Log
Number=0:
.1.3.6.1.4.1.562.29.6.1.1.1.4: STRING: USP398:
.1.3.6.1.4.1.562.29.6.1.1.1.5: STRING: IEMS=USP-1349-Unit-
0;USP=COMP4;Shelf=0;Slot=12;ContextID=0x1010101:
.1.3.6.1.4.1.562.29.6.1.1.1.6: INTEGER: 2:
.1.3.6.1.4.1.562.29.6.1.1.1.7: INTEGER: 48:
```

#### USP 399: Alarm Clear

```
.1.3.6.1.2.1.1.3.0: TimeTicks: 2 hours, 13 minutes, 41 seconds.:
.1.3.6.1.6.3.1.1.4.1.0: Object ID: .1.3.6.1.4.1.562.29.6.1.0.301:
.1.3.6.1.2.1.118.1.2.2.1.10: Object ID:
.1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.28.50.4
8.48.54.45.48.50.45.49.55.44.48.49.58.49.48.58.50.49.46.48.44.45.48.53.58.48.48.2
80149:
.1.3.6.1.2.1.118.1.2.2.1.2: 07 d6 02 11 01 0a 15 00 2d 05 00:
.1.3.6.1.2.1.118.1.2.2.1.11: STRING: DeviceSpecificInfo=;netping entry deleted: 1
1.1.1.1:
.1.3.6.1.4.1.562.29.6.1.1.1.1: INTEGER: 2:
.1.3.6.1.4.1.562.29.6.1.1.1.2: INTEGER: 1024:
.1.3.6.1.4.1.562.29.6.1.1.1.3: STRING: :
.1.3.6.1.4.1.562.29.6.1.1.1.4: STRING: USP399:
.1.3.6.1.4.1.562.29.6.1.1.1.5: STRING: IEMS=USP-1349-Unit-
0;USP=COMP4;Shelf=0;Slot=15;ContextID=0x1010101:
.1.3.6.1.4.1.562.29.6.1.1.1.7: INTEGER: 49:
```

### Syslog

The following is an example of a USP log in Syslog format:

```
Feb 22 01:50:39 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0088~~ USP398 MAJOR FLT
USP Fault^M Location: 47.135.60.201^M Notification Id: 526^M State:
Raised^M Category: processingError^M Cause:
applicationSubsystemFailure(2)^M Time: Jan 20 07:10:29 2004^M Component
Id: USP=autoimage;Shelf=0;Slot=15;ContextID=0x0^M Specific Problem: Log
GroupID=13;Log Group=System Node Maintenance;Log N^M umber=3^M Description:
Transition to DISABLED Operational State.
```



## Performance

### OM and PM Documentation references for USP

- NN10137-711 - USP Performance Management
- NN10138-711 - USP-Compact Performance Management
- USP Logs & OMs - USP Logs and OMs

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided.

Note that for SN08, the OMs/PMs are provided in raw CSV format.

### XML

The following is an example of performance data for USP in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
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xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
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## CSV

The following is an example of performance data for USP in CSV format:

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PM,commonFormat.xsd,2004-12-09T16:35:32EST

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SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId,Type
47.135.60.71,USP

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
Linkset Utilization,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label
Linkset Inactivity Duration,RST Received Count,RST Transmitted Count,TFA and TCA
Received Count,TFA and TCA Transmitted Count,TFC Received Count,TFC Transmitted
Count,TFP and TCP Received Count,TFP and TCP Transmitted Count,TFR and TCR
Received Count,TFR and TCR Transmitted Count,UPU Received Count
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MSUs Count,Sent MSUs Count,Terminated MSUs Count
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0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0
Table=End

```

```

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
Link Faults and Performance,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label,Label,Label
Number of SUs received in error,Number of negative ack.received,Octets
Retransmitted,SL alignment or proving failure,SL failure-Abnormal FIBR/BSNR,SL
failure-All reasons,SL failure-Exc. delay of ack,SL failure-Exc. duration of
con,SL failure-Excessive error rate,SL failure-Other reasons
Value,Value,Value,Value,Value,Value,Value,Value,Value,Value,Value
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,0,0
Table=End

```

```

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
System Node State,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label
Disabled, Locked Duration,Disabled, Unlocked Duration,Enabled, Locked
Duration,Enabled, Unlocked Duration,Locked, Off-line Duration,Percentage Enabled
Value,Value,Value,Value,Value,Value,Value
0,0,0,300,0,100
0,0,0,300,0,100
0,300,0,0,0,0
0,0,300,0,0,100
0,0,0,300,0,100
0,0,0,300,0,100
0,0,0,300,0,100
0,0,0,300,0,100
300,0,0,0,0,0
0,0,0,300,0,100
0,0,300,0,0,100
0,0,0,300,0,100
0,0,0,300,0,100
0,0,0,300,0,100
0,0,0,0,300,0
300,0,0,0,0,0
Table=End

```

```

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
SCTP Management/Traffic Counts,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label

```

```
Association Aborted Count,Association Establish Attempts,Association Terminated
Count,Chunk Retransmitted Count,Chunks Received Count,Chunks Transmitted
Count,Established Association Count,Out of Blue SCTP Packet
Value,Value,Value,Value,Value,Value,Value,Value,Value
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
Log Server,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label
Critical Alarms Ack Count,Critical Alarms Cleared Count,Critical Alarms Received
Count,Major Alarms Ack Count,Major Alarms Cleared Count,Major Alarms Received
Count,Minor Alarms Ack Count,Minor Alarms Cleared Count,Minor Alarms Received
Count
Value,Value,Value,Value,Value,Value,Value,Value,Value
0,0,0,0,0,0,0,0,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
UDP,Snapshot,5,2004-12-09T09:15:00EST
Label
Full Socket Count
Value
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
Gateway Screening Results,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label,Label,Label,Label
Disallowed Cld Party Addr Count,Disallowed ISUP Count,Disallowed Trans Type
Count,Invalid Affct Destination Count,Invalid Affct PC-SSN Count,Invalid Cng Party
Addr Count,Invalid DPC Count,Invalid OPC Count,Invalid SIO Count
Value,Value,Value,Value,Value,Value,Value,Value,Value
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0
Table=End
```







```
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,0,0
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
0,0,0,0,0,0,0,0,0,300,0,0,0,0,0,300
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
BICC Received Message Counts,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label
BICC Call P Received Count,BICC Error No OPC Route,BICC Error No Path,BICC Error
No Route,BICC Maint Received Count
Value,Value,Value,Value,Value
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
0,0,0,0,0
Table=End
```

```
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
ASP Path Management,Snapshot,5,2004-12-09T09:15:00EST
Label,Label,Label,Label,Label,Label
Path Down Time,Path Restore Time,Path Up Time,Path entered Down state,Path entered
Restoring state,Path entered Up state
Value,Value,Value,Value,Value,Value
300,0,0,0,0,0
300,0,0,0,0,0
300,0,0,0,0,0
300,0,0,0,0,0
300,0,0,0,0,0
300,0,0,0,0,0
Table=End
```



```
Alt Routing on Cong Count,GTT Performed Count,Hop Counter Violation Count,No  
Translation for Addr Count,Trans Type Not Found Count  
Value,Value,Value,Value,Value  
0,0,0,0,0  
Table=End
```

Entity=End

System=End

PMFile=End

## **GUI/CLUI Documentation for USP**

### **GUI Launching and User procedures**

- NN10093511 - USP Configuration Management
- NN10094511 - USP-Compact Operation Configuration
- NN10159611 - USP Administration and Security
- NN10160611 - USP-Compact Administration and Security

### **Related documents**

- NN10008111 - USP Basics
- NN10045461 - Upgrading the USP
- NN10009111 - USP-Compact Product and Technology Fundamentals

## **XACore**

This section contains IEMS Northbound log samples and device documentation references for the XACore.

### **XACore Fault Interface**

#### **Fault documentation for XACore:**

- 297-8991-510 - XA-Core Maintenance Manual
- 297-8991-511 - XA-Core Maintenance Guide
- NN10275-909 - Succession fault Management logs Reference
- NN10083-911 - Communication Server 2000 Fault Management

#### **DMS Standard (North America)**



- 297-8021-840P1 - North American DMS100 Log Report Reference Manual Volume 1 of 8
- 297-8021-840P2 - North American DMS100 Log Report Reference Manual Volume 2 of 8
- 297-8021-840P3 - North American DMS100 Log Report Reference Manual Volume 3 of 8
- 297-8021-840P4 - North American DMS100 Log Report Reference Manual Volume 4 of 8
- 297-8021-840P5 - North American DMS100 Log Report Reference Manual Volume 5 of 8
- 297-8021-840P6 - North American DMS100 Log Report Reference Manual Volume 6 of 8
- 297-8021-840P7 - North American DMS100 Log Report Reference Manual Volume 7 of 8
- 297-8021-840P8 - North American DMS100 Log Report Reference Manual Volume 8 of 8

#### **International Succession**

- 297-9051-8401 - DMS100 Log Report Reference Manual Volume 1 of 7
- 297-9051-8402 - DMS100 Log Report Reference Manual Volume 2 of 7
- 297-9051-8403 - DMS100 Log Report Reference Manual Volume 3 of 7
- 297-9051-8404 - DMS100 Log Report Reference Manual Volume 4 of 7
- 297-9051-8405 - DMS100 Log Report Reference Manual Volume 5 of 7
- 297-9051-8406 - DMS100 Log Report Reference Manual Volume 6 of 7
- 297-9051-8407 - DMS100 Log Report Reference Manual Volume 7 of 7

#### **Fault Mapping for XACore**

The following criteria can be used for looking up information on specific faults for XACore.

##### **Fault Correlation for XACore**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>             | <b>NTSTD</b>            | <b>SNMP</b>             | <b>Syslog</b>           | <b>Document Reference</b>                 |
|--------------------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------------------------|
| <b>XACore</b>                        | log name and log number | log name and log number | log name and log number | log name and log number | 297-8991-510 - XA-Core Maintenance Manual |

## Northbound Fault Formats for XACore

### SCC2

The following is an example of a XACore log in SCC2 format:

```
* 47 XAC 305 0114 FLT RTIF (Reset Terminal Interface)
  DESCRIPTION: State has changed from INSV to SYSB by FAULT action
  PORT: Type State Site FL Row Bay    Shf/Slt/Pk/Pt    EqPEC/Serial
        RTIF SYSB  HOST 01 A00 DPCC:00 00 15R U   1 NTLX08AA/  NNTM17205KR8
  REASON: Device Fault: RTIF IPC Protocol Error.
  FAULT RECORD ID: 880166C7
```

### NTSTD

The following is an example of a XACore log in NTSTD format:

```
COMPACT06BT * XAC305 Feb15 00:47:43 0114 FLT RTIF (Reset Terminal Interface)
  DESCRIPTION: State has changed from INSV to SYSB by FAULT action
  PORT: Type State Site FL Row Bay    Shf/Slt/Pk/Pt    EqPEC/Serial
        RTIF SYSB  HOST 01 A00 DPCC:00 00 15R U   1 NTLX08AA/  NNTM17205KR8
  REASON: Device Fault: RTIF IPC Protocol Error.
  FAULT RECORD ID: 880166C7
```

### SNMP

The following is an example of a XACore log in SNMP format:

```
sysUpTime. => 0:28:39
snmpTrapOID. => nnExtAlarmMinor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.54.45.50.52.44.51.58.53.51.58.52.49.46.48.44.5248
alarmActiveDateAndTime => 2004-6-24,3:53:41.0
alarmActiveDescription => Far end has raised a Line Remote Failure Indication alarm
(rxRfiAlarm)
event: set
compId: EM MANTEO LP 3 SONET 2
severity: minor
faultcode: 70115203
alarmType: communications
commentData: Far end has raised a Line Remote Failure Indication alarm (rxRfiAlarm).
```

Check the operational attributes of the far-end.

```
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => 70115203
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0m3.us.nortel.com-MDM-Mgr;EM MANTEO
LP 3 SONET 2
nnExtAlarmActiveManualClear => 1
nnExtAlarmActiveSequenceNumber => 1375

sysUpTime. => 0:28:47
snmpTrapOID. => nnExtAlarmMinor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.54.45.50.52.44.51.58.53.51.58.52.56.46.48.44.5249
alarmActiveDateAndTime => 2004-6-24,3:53:48.0
alarmActiveDescription => Far end line: Entering unavailable state (10 consecutive
SESS)
event: set
compId: EM MANTEO LP 3 SONET 2
severity: minor
faultcode: 70115210
alarmType: communications
commentData: Far end line: Entering unavailable state (10 consecutive SESS).
Check the provisioning or the hardware on the local and far end.
```

```
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 12
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => 70115210
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0m3.us.nortel.com-MDM-Mgr;EM MANTEO
LP 3 SONET 2
nnExtAlarmActiveManualClear => 1
nnExtAlarmActiveSequenceNumber => 1376
```

## Syslog

The following is an example of a XACore log in Syslog format:

```
Feb 14 19:47:43 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=9773~~ XAC305 MINOR FLT
RTIF (Reset Terminal Interface)^M node CM ^M DESCRIPTION: State
has changed from INSV to SYSB by FAULT action^M PORT: Type State Site FL Row
Bay Shf/Slt/Pk/Pt EqPEC/Serial^M RTIF SYSB HOST 01 A00 DPCC:00 00
15R U 1 NTLX08AA/ NNTM17205KR8^M REASON: Device Fault: RTIF IPC Protocol
Error. ^M FAULT RECORD ID: 880166C7
```

## Performance

### OM and PM Documentation references for XACore

- 297-8991-810 - XA-Core Reference Manual
- NN10149-711 - Communications Server 2000 Performance Management

### DMS Standard (North America)

- 297-8021-814P1 - North American DMS-100 Operational Measurements Reference Manual Volume 1 of 6
- 297-8021-814P2 - North American DMS-100 Operational Measurements Reference Manual Volume 2 of 6
- 297-8021-814P3 - North American DMS-100 Operational Measurements Reference Manual Volume 3 of 6
- 297-8021-814P4 - North American DMS-100 Operational Measurements Reference Manual Volume 4 of 6
- 297-8021-814P5 - North American DMS-100 Operational Measurements Reference Manual Volume 5 of 6
- 297-8021-814P6 - North American DMS-100 Operational Measurements Reference Manual Volume 6 of 6

### International Succession

- 297-9051-8141 - DMS-100 Family Operational Measurements Reference Manual Volume 1 of 6
- 297-9051-8142 - DMS-100 Family Operational Measurements Reference Manual Volume 2 of 6
- 297-9051-8143 - DMS-100 Family Operational Measurements Reference Manual Volume 3 of 6
- 297-9051-8144 - DMS-100 Family Operational Measurements Reference Manual Volume 4 of 6
- 297-9051-8145 - DMS-100 Family Operational Measurements Reference Manual Volume 5 of 6
- 297-9051-8146 - DMS-100 Family Operational Measurements Reference Manual Volume 6 of 6

## Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

Performance measurements for XACore are available from the CS2K Core Manager. See NN10149-711 - Communications Server 2000 Performance Management for more information.

### XML

The following is an example of Performance data for XACore in XML format:

***Note:** The IEMS northbound performance interface does not support this device.*

### CSV

The following is an example of Performance data for XACore in CSV format:

***Note:** The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for XACore

The XACore provides both command-line and MAP-based interfaces accessed through the CS2000 Core Manager.

### GUI/CLUI Launching and User procedures

- NN10018-111 - CS2000 Core Manager Basics  
see section “Accessing the Core”

### Related documents

- NN10197-111 - Communication Server 2000 Basics
- NN10193-511 - Communication Server 2000 Configuration Management
- NN10127-811 - Communication Server 2000 Accounting Management
- NN10171-611 - Communication Server 2000 Security and Administration
- 297-5051-921 - SuperNode Data Manager DDMS ASCII CI Gateway User Guide
- 297-5161-022P1 - Advanced Intelligent Network Service Enablers SIG Volume 1 of 3
- 297-5161-022P2 - Advanced Intelligent Network Service Enablers SIG Volume 2 of 3
- 297-5161-022P3 - Advanced Intelligent Network Service Enablers SIG Volume 3 of 3

- 297-8021-350P1 - North American DMS-100 Translations Guide Volume 1 of 25
- 297-8021-350P2 - North American DMS-100 Translations Guide Volume 2 of 25
- 297-8021-350P3 - North American DMS-100 Translations Guide Volume 3 of 25
- 297-8021-350P4 - North American DMS-100 Translations Guide Volume 4 of 25
- 297-8021-350P5 - North American DMS-100 Translations Guide Volume 5 of 25
- 297-8021-350P6 - North American DMS-100 Translations Guide Volume 6 of 25
- 297-8021-350P7 - North American DMS-100 Translations Guide Volume 7 of 25
- 297-8021-350P8 - North American DMS-100 Translations Guide Volume 8 of 25
- 297-8021-350P9 - North American DMS-100 Translations Guide Volume 9 of 25
- 297-8021-350P10 - North American DMS-100 Translations Guide Volume 10 of 25
- 297-8021-350P11 - North American DMS-100 Translations Guide Volume 11 of 25
- 297-8021-350P12 - North American DMS-100 Translations Guide Volume 12 of 25
- 297-8021-350P13 - North American DMS-100 Translations Guide Volume 13 of 25
- 297-8021-350P14 - North American DMS-100 Translations Guide Volume 14 of 25
- 297-8021-350P15 - North American DMS-100 Translations Guide Volume 15 of 25
- 297-8021-350P16 - North American DMS-100 Translations Guide Volume 16 of 25
- 297-8021-350P17 - North American DMS-100 Translations Guide Volume 17 of 25
- 297-8021-350P18 - North American DMS-100 Translations Guide Volume 18 of 25
- 297-8021-350P19 - North American DMS-100 Translations Guide Volume 19 of 25

- 297-8021-350P20 - North American DMS-100 Translations Guide Volume 20 of 25
- 297-8021-350P21 - North American DMS-100 Translations Guide Volume 21 of 25
- 297-8021-350P22 - North American DMS-100 Translations Guide Volume 22 of 25
- 297-8021-350P23 - North American DMS-100 Translations Guide Volume 23 of 25
- 297-8021-350P24 - North American DMS-100 Translations Guide Volume 24 of 25
- 297-8021-350P25 - North American DMS-100 Translations Guide Volume 25 of 25
- 297-8021-351P1 - DMS-100 Data Schema Reference Manual
- 297-8021-351P2 - DMS-100 Data Schema Reference Manual
- 297-8021-351P3 - DMS-100 Data Schema Reference Manual
- 297-8021-351P4 - DMS-100 Data Schema Reference Manual
- 297-8021-351P5 - DMS-100 Data Schema Reference Manual
- 297-8021-351P6 - DMS-100 Data Schema Reference Manual
- 297-8021-351P7 - DMS-100 Data Schema Reference Manual
- 297-8021-351P8 - DMS-100 Data Schema Reference Manual
- 297-8021-351P9 - DMS-100 Data Schema Reference Manual
- 297-8021-351P10 - DMS-100 Data Schema Reference Manual
- 297-8021-351P11 - DMS-100 Data Schema Reference Manual
- 297-8021-351P12 - DMS-100 Data Schema Reference Manual
- 297-8021-801 - DMS-100 Feature Guide
- 297-8021-808P1 - DMS-100 SERVORD Reference Manual
- 297-8021-808P2 - DMS-100 SERVORD Reference Manual
- 297-8021-814P1 - DMS-100 Operational Measurements Reference Manual
- 297-8021-814P2 - DMS-100 Operational Measurements Reference Manual
- 297-8021-814P3 - DMS-100 Operational Measurements Reference Manual
- 297-8021-814P4 - DMS-100 Operational Measurements Reference Manual

- 297-8021-814P5 - DMS-100 Operational Measurements Reference Manual
- 297-8021-814P6 - DMS-100 Operational Measurements Reference Manual
- 297-8021-840P1 - DMS-100 Logs Reference Manual
- 297-8021-840P2 - DMS-100 Logs Reference Manual
- 297-8021-840P3 - DMS-100 Logs Reference Manual
- 297-8021-840P4 - DMS-100 Logs Reference Manual
- 297-8021-840P5 - DMS-100 Logs Reference Manual
- 297-8021-840P6 - DMS-100 Logs Reference Manual
- 297-8021-840P7 - DMS-100 Logs Reference Manual
- 297-8021-840P8 - DMS-100 Logs Reference Manual
- 297-8021-855P1 - DMS-100 Office Parameters Reference Manual
- 297-8021-855P2 - DMS-100 Office Parameters Reference Manual
- 297-8021-855P3 - DMS-100 Office Parameters Reference Manual
- 297-8991-810 - XA-Core Reference Manual

# Platforms

## SDM Platform

This section contains IEMS Northbound log samples and device documentation references for the SDM Platform.

### SDM Platform Fault Interface

#### Fault documentation for SDM Platform:

- NN10081-911 SDM Fault Management



## Fault Mapping for SDM Platform

The following criteria can be used for looking up information on specific faults for SDM Platform.

### Fault Correlation for SDM Platform

| NB format -><br>Device/EM | SCC2               | NTSTD              | SNMP               | Syslog             | Document Reference                  |
|---------------------------|--------------------|--------------------|--------------------|--------------------|-------------------------------------|
| SDM (Platform) - AIX      | logname and number | logname and number | logname and number | logname and number | NN10081-911<br>SDM Fault Management |

## Northbound Fault Formats for SDM Platform

### SCC2

The following is an example of a SDM Platform log in SCC2 format:

```
* 52 SDM 317 0162 TBL
    node SDM      SDM Base Maintenance
DCE problem detected
Reason: SEC Master Server 47.142.94.49 is down.
```

### NTSTD

The following is an example of a SDM Platform log in NTSTD format:

```
COMPACT06BT * SDM 317 Feb15 00:52:49 0162 TBL
    node SDM      SDM Base Maintenance
DCE problem detected
Reason: SEC Master Server 47.142.94.49 is down.
```

### SNMP

The following is an example of a SDM Platform log in SNMP format:

```
sysUpTime.0 => 9:27:56
snmpTrapOID.0 => nnExtAlarmMinor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.49.44.54.58.52.49.58.49.52.46.48.44.8995
alarmActiveDateAndTime => 2004-1-14,7:52:49.1
```

```
alarmActiveDescription => SEC Master Server 47.142.94.49 is down.
Reason: SEC Master Server 47.142.94.49 is down.

nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => SDM 317
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0m0.us.nortel.com-SDM;
nnExtAlarmActiveManualClear => 2
nnExtAlarmActiveSequenceNumber => 35
```

## Syslog

The following is an example of a SDM Platform log in Syslog format:

```
Feb 14 19:52:49 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=9821~~ SDM317 MINOR TBL
^M      node SDM      SDM Base Maintenance^M      DCE problem detected^M      Reason:
SEC Master Server 47.142.94.49 is down.
```

## Performance

### OM and PM Documentation references for SDM Platform

- NN10147-711 SDM Performance Management

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of performance data for SDM Platform in XML format:

***Note:** The IEMS northbound performance interface does not support this device.*

#### CSV

The following is an example of performance data for SDM Platform in CSV format:

***Note:** The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for SDM Platform

SDM Platform has a command line user interface that can be accessed via a secure shell.

### GUI/CLUI Launching and User procedures

- NN10017-111 SDM Basics (see User Interfaces Overview)

### Related documents

- NN10059-461 Upgrading the SDM
- NN10103-511 SDM Configuration Management
- NN10125-811 SDM Accounting
- NN10169-611 SDM Security and Administration

## Succession Server Platform Foundation Software (SSPFS)

This section contains IEMS Northbound log samples and device documentation references for the SSPFS platform.

### SSPFS Fault Interface

#### Fault documentation for SSPFS

- NN10440-450 - Upgrading a Carrier VoIP Network

#### Fault Mapping for SSPFS

The following criteria can be used for looking up information on specific faults for SSPFS.

##### Fault Correlation for SSPFS

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                                 |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------------------------------|
| SSPFS                     | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10440-450<br>Upgrading a<br>Carrier VoIP<br>Network |

#### Northbound Fault Formats for SSPFS

The SSPFS SNMP interface is not implemented yet.

**SCC2**

The following is an example of a SSPFS log in SCC2 format:

*Not available at time of publication*

**NTSTD**

The following is an example of a SSPFS log in NTSTD format:

*Not available at time of publication*

**SNMP**

The following is an example of a SSPFS log in SNMP format:

*Not available at time of publication*

**Syslog**

The following is an example of a SSPFS log in Syslog format:

*Not available at time of publication*

**Performance****OM and PM Documentation references for SSPFS**

The SSPFS platform does not generate and OM's or PM's, but it does collect such information from other network elements. For more information see:

- NN10276-500 - ATM/IP Configuration Management (Configuration of SNMP Poller)
- Upgrading a Carrier VoIP Network, NN10440-450.

**Northbound OM/PM Formats**

This section provides example output of Performance Measurement data in each of the Northbound formats provided

**XML**

The following is an example of performance data for SSPFS platform in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
<FileCreationTime>2004-12-14T13:20:20EST</FileCreationTime>
<System>
<SystemId>NortelNetworks/IEMS</SystemId>
<Entity Type="SSPFS">
<EntityId>47.142.106.220</EntityId>
<Table MeasurementKind="Snapshot" IntervalDuration="5">
<TableId>.iso.org.dod.internet.mgmt.mib-2.ip.ipAddrTable.ipAddrEntry</TableId>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<Labels>
```

```
<Label>ipAdEntAddr</Label>
<Label>ipAdEntIfIndex</Label>
<Label>ipAdEntNetMask</Label>
<Label>ipAdEntBcastAddr</Label>
<Label>ipAdEntReasmMaxSize</Label>
</Labels>
<RowOfValues>
<RowValue>
<Value>47.142.106.222</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>255.255.255.0</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>65535</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>47.142.106.220</Value>
</RowValue>
<RowValue>
<Value>2</Value>
</RowValue>
<RowValue>
<Value>255.255.255.0</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>65535</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>192.168.47.1</Value>
</RowValue>
<RowValue>
<Value>5</Value>
</RowValue>
<RowValue>
<Value>255.255.255.0</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>65535</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>127.0.0.1</Value>
</RowValue>
<RowValue>
<Value>6</Value>
</RowValue>
```

```
<RowValue>
<Value>255.0.0.0</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>65535</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>47.142.106.224</Value>
</RowValue>
<RowValue>
<Value>4</Value>
</RowValue>
<RowValue>
<Value>255.255.255.0</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>65535</Value>
</RowValue>
</RowOfValues>
<RowOfValues>
<RowValue>
<Value>47.142.106.223</Value>
</RowValue>
<RowValue>
<Value>3</Value>
</RowValue>
<RowValue>
<Value>255.255.255.0</Value>
</RowValue>
<RowValue>
<Value>1</Value>
</RowValue>
<RowValue>
<Value>65535</Value>
</RowValue>
</RowOfValues>
</Table>
<SingleValues MeasurementKind="Snapshot" IntervalDuration="5">
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipInUnknownProtos</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipFragCreates</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>418461</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipOutRequests</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
```

```
<Value>19623971</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipInDelivers</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>21482658</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipOutNoRoutes</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipDefaultTTL</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>255</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipReasmReqds</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>137693</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipInHdrErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipReasmFails</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipForwDatagrams</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipFragFails</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipInDiscards</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipOutDiscards</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>4</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipForwarding</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>2</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipReasmTimeout</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>60</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipInReceives</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>17207338</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipReasmOKs</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>137693</Value>
<Reliability>Valid</Reliability>
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<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipRoutingDiscards</MeasureId>
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<Value>0</Value>
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<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipInAddrErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:00EST</CaptureTime>
<MeasureId>ipFragOKs</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.mgmt.mib-2.ip</MeasureSuppId1>
<Value>138590</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsIfInErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
```



```
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsSystemProcessTime</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsIfCollisions</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsDiskXfer1</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsVSwapIn</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsDiskXfer3</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsVIntr</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsVPagesIn</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsIfOutPackets</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsNiceModeTime</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsIfOutErrors</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsIdleModeTime</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsVPagesOut</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsDiskXfer2</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsVSwapOut</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsDiskXfer4</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsIfInPackets</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
```

```

<Reliability>Valid</Reliability>
</SingleValue>
<SingleValue>
<CaptureTime>2004-12-14T13:20:01EST</CaptureTime>
<MeasureId>rsUserProcessTime</MeasureId>
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf
</MeasureSuppId1>
<Value>0</Value>
<Reliability>Valid</Reliability>
</SingleValue>
</SingleValues>
</Entity>
</System>
</PMFile>
</PMFile>

```

## CSV

The following is an example of performance data for SSPFS platform in CSV format:

```

PMFile=Begin
MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime
PM,commonFormat.xsd,2004-12-14T13:20:20EST

System=Begin
SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId,Type
47.142.106.220,SSPFS

Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime
.iso.org.dod.internet.mgmt.mib-2.ip.ipAddrTable.ipAddrEntry,Snapshot,5,2004-12-14T13:20:01EST
Label,Label,Label,Label,Label
ipAdEntAddr,ipAdEntIfIndex,ipAdEntNetMask,ipAdEntBcastAddr,ipAdEntReasmMaxSize
Value,Value,Value,Value,Value
47.142.106.222,1,255.255.255.0,1,65535
47.142.106.220,2,255.255.255.0,1,65535
192.168.47.1,5,255.255.255.0,1,65535
127.0.0.1,6,255.0.0.0,1,65535
47.142.106.224,4,255.255.255.0,1,65535
47.142.106.223,3,255.255.255.0,1,65535
Table=End

SingleValues=Begin
MeasurementKind,IntervalDuration
Snapshot,5
MeasureId,CaptureTime,MeasureSuppId1,Value,Reliability
ipInUnknownProtos,2004-12-14T13:20:00EST,.iso.org.dod.internet.mgmt.mib-2.ip,0,Valid
ipFragCreates,2004-12-14T13:20:00EST,.iso.org.dod.internet.mgmt.mib-2.ip,418461,Valid
ipOutRequests,2004-12-14T13:20:00EST,.iso.org.dod.internet.mgmt.mib-2.ip,19623971,Valid
ipInDelivers,2004-12-14T13:20:00EST,.iso.org.dod.internet.mgmt.mib-2.ip,21482658,Valid
ipOutNoRoutes,2004-12-14T13:20:00EST,.iso.org.dod.internet.mgmt.mib-2.ip,0,Valid

```

ipDefaultTTL, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 255, Valid  
ipReasmReqds, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 137693, Valid  
ipInHdrErrors, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipReasmFails, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipForwDatagrams, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipFragFails, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipInDiscards, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipOutDiscards, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 4, Valid  
ipForwarding, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 2, Valid  
ipReasmTimeout, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 60, Valid  
ipInReceives, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 17207338, Valid  
ipReasmOKs, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 137693, Valid  
ipRoutingDiscards, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipInAddrErrors, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 0, Valid  
ipFragOKs, 2004-12-14T13:20:00EST, .iso.org.dod.internet.mgmt.mib-2.ip, 138590, Valid  
rsIfInErrors, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsSystemProcessTime, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsIfCollisions, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsDiskXfer1, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsVSwapIn, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsDiskXfer3, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsVIntr, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsVPagesIn, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsIfOutPackets, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsNiceModeTime, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsIfOutErrors, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsIdleModeTime, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid  
rsVPagesOut, 2004-12-14T13:20:01EST, .iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf, 0, Valid

```
rsDiskXfer2,2004-12-
14T13:20:01EST,.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf,
0,Valid
rsVSwapOut,2004-12-
14T13:20:01EST,.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf,
0,Valid
rsDiskXfer4,2004-12-
14T13:20:01EST,.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf,
0,Valid
rsIfInPackets,2004-12-
14T13:20:01EST,.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf,
0,Valid
rsUserProcessTime,2004-12-
14T13:20:01EST,.iso.org.dod.internet.private.enterprises.sun.sunMib.sunHostPerf,
0,Valid
SingleValues=End

Entity=End

System=End

PMFile=End
```

## GUI/CLUI Documentation for SSPFS

### GUI Launching and User procedures

- NN10276-500 - ATM/IP Configuration Management

*Note:* Contains information on the SSPFS CLI interface

### Related documents

- NN10281-600 - ATM/IP Administration and Security

# Element Managers

## CS2000 Core Manager

This section contains IEMS Northbound log samples and device documentation references for the CS2K Core Manager.

## CS2K Core Manager Fault Interface

### Fault documentation for CS2000 Core Manager:

- NN10275-909 - Succession fault Management logs Reference
- NN10082-911 - CS 2000 Core Manager Fault Management

### Fault Mapping for CS2000 Core Manager

The following criteria can be used for looking up information on specific faults for CS2000 Core Manager.

#### Fault Correlation for CS2000 Core Manager

| NB format -><br>Device/EM | SCC2                   | NTSTD                  | SNMP                   | Syslog                 | Document<br>Reference                                                                                                                         |
|---------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| CS2000 Core<br>Manager    | log name and<br>number | log name and<br>number | log name and<br>number | log name and<br>number | NN10275-909<br>Succession<br>fault<br>Management<br>logs<br>Reference<br><br>NN10082-911<br>CS 2000<br>Core<br>Manager<br>Fault<br>Management |

### Northbound Fault Formats for CS2000 Core Manager

#### SCC2

The following is an example of a CS2000 Core Manager log in SCC2 format:

```
* 06 SDM 550 1506 INFO Node Status Change
Node:   SDM 0
Status: ** ISTb          from ** ISTb
Reason: Application alarm set. SDM_ETA.eta
```

#### NTSTD

The following is an example of a CS2000 Core Manager log in NTSTD format:

```
COMPACT506BT    * SDM550 Feb15 03:07:00 1520 INFO Node Status Change
Node:          SDM 0
Status:        InSv          from    * ISTb
Reason:        Application alarm cleared. SDM_ETA.eta
```

## SNMP

The following is an example of a CS2000 Core Manager log in SNMP format:

```
sysUpTime. => 1 day, 19:19:26
snmpTrapOID. => nnExtAlarmMessage
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr;
nnExtAlarmMessageDateAndTime => 2004-6-9,3:4:9.1
nnExtAlarmMessageDocumentationPointer => PM 610
nnExtAlarmMessageInfo => 04 PM 610 3352 INFO ABI XPM C-side Link State Change
```

```
Node: SMA2 0      Link: 0      Plane: 0      Port: 0
```

```
From: SYSB      To: INSV
```

```
Reason: Link opened by MG9K/ABI
```

```
sysUpTime.0 => 1 day, 19:19:27
snmpTrapOID.0 =>
alarmActiveResourceId => .0.0
alarmActiveDateAndTime => 2004-6-9,3:4:9.3
alarmActiveDescription => Application alarm set. SDM_ETA.eta
Status:  ** ISTb          from  ** ISTb
Reason: Application alarm set. SDM_ETA.eta
```

## Syslog

The following is an example of a CS2000 Core Manager log in Syslog format:

```
Feb 14 22:06:01 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=1165~~ SDM550 MINOR INFO
Node Status Change^M          node CM          ^M          Node:  SDM 0^M          Status:  **
ISTb          from  ** ISTb          ^M          Reason: Application alarm set. SDM_ETA.eta
```

## Performance

### OM and PM Documentation references for CS2000 Core Manager

- NN10148-711 - CS 2000 Core Manager Performance Management

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of performance data for CS2000 Core Manager in XML format:

***Note:** Northbound performance interface not supported for this component.*

#### CSV

The following is an example of performance data for CS2000 Core Manager in CSV format:

***Note:** Northbound performance interface not supported for this component.*

### GUI/CLUI Documentation for CS2000 Core Manager

The CS2000 Core Manager provides both command-line and MAP-based interfaces.

### GUI/CLUI Launching and User procedures

- NN10018-111 - CS2000 Core Manager Basics

### Related documents

- NN10060-461 - Upgrading the CS 2000 Core Manager
- NN10082-911 - CS 2000 Core Manager Fault Management
- NN10104-511 - CS 2000 Core Manager Configuration Management
- NN10126-811 - CS 2000 Core Manager Accounting
- NN10170-611 - CS 2000 Core Manager Administration and Security



## Centrex IP Call Manager (CICM Manager)

This section contains IEMS Northbound log samples and device documentation references for the CICM Manager.

### CICM Fault Interface

#### Fault documentation for CICM Manager:

- NN10334-911 - IEMS Fault Management

#### Fault Mapping for CICM Manager

The following criteria can be used for looking up information on specific faults for CICM Manager.

#### Fault Correlation for CICM Manager

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                     |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------------------|
| CICM Mgr                  | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10334-911<br>- IEMS Fault<br>Management |

### Northbound Fault Formats for CICM Manager

#### SCC2

The following is an example of a CICM Manager log in SCC2 format:

?

```
44 IEMS399 0011 FLT Communication Regained
Location: 47.142.106.223
NotificationID: 0
State: Cleared
Category: Communications
Time: Jun 30 15:44:06 2004
ComponentId: 47.165.168.74-CICM-Mgr_Card_B
Description: IEMS regained communication with the managed device
```

?

```
*C44 IEMS398 0012 FLT Communication Lost
```

Location: 47.142.106.223  
NotificationID: 0  
State: Raised  
Category: Communications  
Cause: Communications subsystem failure  
Time: Jun 30 15:44:15 2004  
ComponentId: 47.165.168.74-CICM-Mgr\_Card\_B  
Specific Problem: Connection Lost  
Description: IEMS Unable to communicate with managed device

## NTSTD

The following is an example of a CICM Manager log in NTSTD format:

```
test    IEMS399 JUN30 15:44:06 0011 FLT  Communication Regained
Location: 47.142.106.223
NotificationID: 0
State: Cleared
Category: Communications
Time: Jun 30 15:44:06 2004
ComponentId: 47.165.168.74-CICM-Mgr_Card_B
Description: IEMS regained communication with the managed device

test *** IEMS398 JUN30 15:44:15 0012 FLT  Communication Lost
Location: 47.142.106.223
NotificationID: 0
State: Raised
Category: Communications
Cause: Communications subsystem failure
Time: Jun 30 15:44:15 2004
ComponentId: 47.165.168.74-CICM-Mgr_Card_B
Specific Problem: Connection Lost
Description: IEMS Unable to communicate with managed device
```

## SNMP

The following is an example of a CICM Manager log in SNMP format:

```
sysUpTime. => 19:40:37
snmpTrapOID. => nnExtAlarmMajor
```

```

alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
20.50.48
.48.52.45.54.45.50.57.44.49.48.58.50.57.58.48.46.52.44.11925
alarmActiveDateAndTime => 2004-6-29,10:29:0.4
alarmActiveDescription => DeviceSpecificInfo=softwareProgramError(48);Backup
Fail
nnExtAlarmActiveEventType => 4
nnExtAlarmActiveProbableCause => 1024
nnExtAlarmActiveAdditionalText => Scheduled/on-demand backup failed during
last iteration.
nnExtAlarmActiveDocumentationPointer => C1CM341
nnExtAlarmActiveResourceDescription => IEMS=47.142.86.95-C1CM-
Mgr_Card_A;C1CM=C1CMEM-000-A;NodeType=Platform
nnExtAlarmActiveSequenceNumber => 1

```

## Syslog

The following is an example of a C1CM Manager log in Syslog format:

```

Jun 30 15:44:06 2004      ComponentId: 47.165.168.74-C1CM-Mgr_Card_B      Description:
IEMS regained communication with the managed device

Jun 30 15:44:15 znc0s0tm IEMS: _V2_~I=~H=znc0s0tm~A=IEMS~S=6162~~ IEMS398 CRIT FLT
Communication Lost      Location: 47.142.106.223      NotificationID: 0      State:
Raised      Category: Communications      Cause: Communications subsystem failure
Time:

Jun 30 15:44:15 2004      ComponentId: 47.165.168.74-C1CM-Mgr_Card_B      Specific
Problem: Connection Lost      Description: IEMS Unable to communicate with managed
device

```

## Performance

### OM and PM Documentation references for C1CM Manager

- NN10327-711 - IEMS Performance Management

### Northbound OM/PM Formats

Performance measurements for C1CM Manager are available only from the C1CM Manager interface. See NN10327-711 - IEMS Performance Management for more information.

## XML

The following is an example of Performance data for C1CM Manager in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
_ <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
<FileCreationTime>2004-06-23T13:36:04EST</FileCreationTime>
_ <System>
<SystemId>NortelNetworks/IEMS</SystemId>
_ <Entity Type="CICM Mgr">
<EntityId>47.165.168.120</EntityId>
_ <Table MeasurementKind="Snapshot" IntervalDuration="5
```

```

_ <Labels>
<Label>usrHistoryControlInterval</Label>
<Label>usrHistoryControlIndex</Label>
<Label>usrHistoryControlStatus</Label>
<Label>usrHistoryControlOwner</Label>
</Labels>
_ <RowOfValues>
_ <RowValue>
<Value>900</Value>
</RowValue>
_ <RowValue>
<Value>5</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
_ <RowValue>
<Value>CICM-120A</Value>
</RowValue>
</RowOfValues>
</Table>
_ <Table MeasurementKind="Snapshot" IntervalDuration="5">
<TableId>.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.
nortelPerfRefMIB.nnPerfMetricReferenceTable.nnPerfMetricReferenceEntry</TableId>
<CaptureTime>2004-06-23T13:35:02EST</CaptureTime>
_ <Labels>
<Label>nnPerfMetricValue</Label>
<Label>nnPerfMetricSources</Label>
<Label>nnPerfMetricDataType</Label>
<Label>nnPerfMetricGroup</Label>
<Label>nnPerfMetricName</Label>
<Label>nnPerfMetricRefIndex</Label>
</Labels>
_ <RowOfValues>
_ <RowValue>
<Value>0</Value>

```

```
</RowValue>
_ <RowValue>
<Value>2</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
_ <RowValue>
<Value>CICM</Value>
</RowValue>
_ <RowValue>
<Value>ActiveConnections</Value>
</RowValue>
_ <RowValue>
<Value>5</Value>
</RowValue>
</RowOfValues>
_ <RowOfValues>
_ <RowValue>
<Value>0</Value>
</RowValue>
_ <RowValue>
<Value>2</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
_ <RowValue>
<Value>CICM</Value>
</RowValue>
_ <RowValue>
<Value>PercentageCpuUsed</Value>
</RowValue>
_ <RowValue>
<Value>4</Value>
</RowValue>
```

```
</RowOfValues>
_ <RowOfValues>
_ <RowValue>
<Value>0</Value>
</RowValue>
_ <RowValue>
<Value>2</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
_ <RowValue>
<Value>CICM</Value>
</RowValue>
_ <RowValue>
<Value>PercentageMemoryUsed</Value>
</RowValue>
_ <RowValue>
<Value>3</Value>
</RowValue>
</RowOfValues>
_ <RowOfValues>
_ <RowValue>
<Value>0</Value>
</RowValue>
_ <RowValue>
<Value>2</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
_ <RowValue>
<Value>CICM</Value>
</RowValue>
_ <RowValue>
<Value>NumberOfLogs</Value>
```

```
</RowValue>
_ <RowValue>
<Value>2</Value>
</RowValue>
</RowOfValues>
_ <RowOfValues>
_ <RowValue>
<Value>0</Value>
</RowValue>
_ <RowValue>
<Value>2</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
_ <RowValue>
<Value>CICM</Value>
</RowValue>
_ <RowValue>
<Value>ActiveSessions</Value>
</RowValue>
_ <RowValue>
<Value>1</Value>
</RowValue>
</RowOfValues>
</Table>
</Entity>
</System>
</PMFile>
```

## CSV

The following is an example of Performance data for CICM Manager in CSV format:

PMFile=Begin

MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime



PM,commonFormat.xsd,2005-03-29T15:20:02EST

System=Begin

SystemId

NortelNetworks/IEMS

Entity=Begin

EntityId,Type

47.165.168.252,CICM Mgr

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

.iso.org.dod.internet.mgmt.mib-

2.rmon.usrHistory.usrHistoryControlTable.usrHistoryControlEntry,Snapshot,5,2  
005-03-29T15:20:00EST

Label,Label,Label,Label

usrHistoryControlIndex,usrHistoryControlInterval,usrHistoryControlOwner,usrH  
istoryControlStatus

Value,Value,Value,Value

9,900,CICMEM-070-B,1

Table=End

Table=Begin

TableId,MeasurementKind,IntervalDuration,CaptureTime

.iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.nortelPer  
fRefMIB.nnPerfMetricReferenceTable.nnPerfMetricReferenceEntry,Snapshot,5,200  
5-03-29T15:20:01EST

Label,Label,Label,Label,Label,Label

nnPerfMetricRefIndex,nnPerfMetricName,nnPerfMetricGroup,nnPerfMetricDataType  
,nnPerfMetricSources,nnPerfMetricValue

Value,Value,Value,Value,Value,Value

9,TransmittedBytesPerSecond,CICM,1,2,0

8,ReceivedBytesPerSecond,CICM,1,2,0

7,LoggedInUsers,CICM,1,2,0

6,HalfCallAttempts,CICM,1,2,0

5,ActiveConnections,CICM,1,2,0

4,PercentageCpuUsed,CICM,1,2,1

```
3,PercentageMemoryUsed,CICM,1,2,18
```

```
2,NumberOfLogs,CICM,1,2,0
```

```
1,ActiveSessions,CICM,1,2,0
```

```
Table=End
```

```
Entity=End
```

```
System=End
```

```
PMFile=End
```

## **GUI/CLUI Documentation for CICM Manager**

### **GUI Launching and User procedures**

### **Related documents**

## **GWC Manager**

This section contains IEMS Northbound log samples and device documentation references for the GWC Manager.

### **GWC Manager Fault Interface**

#### **Fault documentation for GWC Mgr :**

- NN10325-900 - ATM/IP Fault Management

#### **Fault Mapping for GWC Mgr**

The following criteria can be used for looking up information on specific faults for GWC Mgr.

**Fault Correlation for GWC Mgr**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>           | <b>NTSTD</b>          | <b>SNMP</b>           | <b>Syslog</b>         | <b>Document<br/>Reference</b>                                                           |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------------------------------------------------------------------------|
| <b>GWC Mgr</b>                       | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | PLN-08AT<br>OSS SN08<br>OSS Guide<br>(ATM)<br><br>PLN-08IPOSS<br>SN08 OSS<br>Guide (IP) |

**Northbound Fault Formats for GWC Mgr****SCC2**

The following is an example of a GWC Mgr log in SCC2 format:

```
*C14 CMT 301 7248 TBL CMT Fault
  Location: gwcem
  NotificationID: 700
  State: Raise
  Category: Processing Error
  Cause: Corrupt data
  Time: Jan 23 15:14:38 2004
  Component Id: SESM=GWCEMalarm;GWCEM=Recovery;GWC=GWC-2-UNIT-0
  Specific Problem: FTP Problem
  Description: Problem detected in GWC Recovery Subsystem
```

**NTSTD**

The following is an example of a GWC Mgr log in NTSTD format:

```
COMPACT06BT *** CMT301 Jan23 20:14:38 7248 TBL CMT Fault
  Location: gwcem
  NotificationID: 700
  State: Raise
  Category: Processing Error
  Cause: Corrupt data
  Time: Jan 23 15:14:38 2004
  Component Id: SESM=GWCEMalarm;GWCEM=Recovery;GWC=GWC-2-UNIT-0
  Specific Problem: FTP Problem
```

Description: Problem detected in GWC Recovery Subsystem

## SNMP

The following is an example of a GWC Mgr log in SNMP format:

```
system.sysUpTime.0 => 23:10:15
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.
20.50.48
.48.52.45.49.45.50.51.44.51.58.49.52.58.51.56.46.48.44.42847
alarmActiveDateAndTime => 2004-1-23,3:14:38.0,
alarmActiveDescription => DeviceSpecificInfo=LANError;GWC is inaccessible
from GWCEM
nnExtAlarmActiveEventType => 2
nnExtAlarmActiveProbableCause => 1024
nnExtAlarmActiveAdditionalText => GWCEM fail to ping both GWC units of GWC-50
nnExtAlarmActiveDocumentationPointer => CMT301
nnExtAlarmActiveResourceDescription => IEMS=rtp4cmt-GWC-
Mgr; SESM=GWCEMalarm;GWCEM=DeviceInAccessible;GWC=GWC-50-UNIT-0
nnExtAlarmActiveManualClear => 0
nnExtAlarmActiveSequenceNumber => 9027
```

## Syslog

The following is an example of a GWC Mgr log in Syslog format:

```
Feb 23 15:15:56 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=7305~~ CMT301 CRIT TBL CMT
Fault^M Location: gwcem^M NotificationID: 700^M State: Raise^M
Category: Processing Error^M Cause: Corrupt data^M Time: Jan 23 15:14:38
2004^M Component Id: SESM=GWCEMalarm;GWCEM=Recovery;GWC=GWC-2-UNIT-0^M
Specific Problem: FTP Problem^M Description: Problem detected in GWC Recovery
Subsystem^M
```

## Performance

### OM and PM Documentation references for GWC Mgr

GWC Mgr has no operational or performance measurements.

- See NN10156-711 - GWC Performance Management for PM information.

## Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

### XML

The following is an example of performance data for GWC Mgr in XML format:

***Note:** Northbound performance interface not supported for this component.*

### CSV

The following is an example of performance data for GWC Mgr in CSV format:

***Note:** Northbound performance interface not supported for this component.*

## GUI/CLUI Documentation for GWC Mgr

### GUI Launching and User procedures

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics
- NN10276-500 - ATM/IP Configuration Management
- NN10281-600 - ATM/IP Administration and Security
- NN10325-900 - ATM/IP Fault Management

### Related documents

## Integrated Element Management System (IEMS)

This section contains IEMS Northbound log samples and device documentation references for the IEMS.

### IEMS Fault Interface

#### Fault documentation for IEMS :

- NN10334-911 - IEMS Fault Management

## Fault Mapping for IEMS

The following criteria can be used for looking up information on specific faults for IEMS.

### Fault Correlation for IEMS

| NB format -><br>Device/EM | SCC2                     | NTSTD                    | SNMP                     | Syslog                   | Document<br>Reference                            |
|---------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------------------------------|
| IEMS                      | logname and<br>logNumber | logname and<br>logNumber | logname and<br>logNumber | logname and<br>logNumber | NN10334-911<br>IEMS Fault<br>Management<br>Guide |

## Northbound Fault Formats for IEMS

### SCC2

The following is an example of a IEMS log in SCC2 format:

```
36 IEMS603 0001 INFO Missed Notifications
Location: 47.142.122.202
Component Id: IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr
Time: Feb 14 19:36:32 2004
Description: Notification(s) missed in ML 5050 - 5149
```

### NTSTD

The following is an example of a IEMS log in NTSTD format:

```
RTPU07BU      IEMS603 Feb15 00:36:32 0001 INFO Missed Notifications
Location: 47.142.122.202
Component Id: IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr
Time: Feb 14 19:36:32 2004
Description: Notification(s) missed in ML 5050 - 5149
```

### SNMP

The following is an example of a IEMS log in SNMP format:

```
sysUpTime.0 => 9:34:06
snmpTrapOID.0 => nnExtAlarmMessage
```

```
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr;
nnExtAlarmMessageDateAndTime => 2004-1-14,7:58:59.2
nnExtAlarmMessageDocumentationPointer => IEMS603
nnExtAlarmMessageInfo => 58 IEMS603 0234 INFO Missed Notifications
    Location: 47.142.122.202
    Component Id: IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr
    Time: Feb 14 19:58:59 2004
    Description: Notification(s) missed in ML 5050 - 5149
```

## Syslog

The following is an example of a IEMS log in Syslog format:

```
Feb 14 18:42:42 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=9198~~ IEMS603 NONE INFO
Missed Notifications^M      Location: 47.142.122.202^M      Component Id:
IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr^M      Time: Feb 14 18:42:41 2004^M
Description: Notification(s) missed in ML 5050 - 5149
```

## Performance

### OM and PM Documentation references for IEMS

- NN10327-711 IEMS Performance Monitoring

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of performance data for IEMS in XML format:

**Note:** Northbound performance interface not supported for this component.

#### CSV

The following is an example of performance data for IEMS in CSV format:

**Note:** Northbound performance interface not supported for this component.

## GUI/CLUI Documentation for IEMS

### GUI Launching and User procedures

- NN10329-111 - IEMS Basics

### Related documents

- NN10336-611 - IEMS Administration and Security
- NN10330-511 - IEMS Operational Configuration
- NN10326-461 - IEMS Upgrades

## MG9000 Manager

This section contains IEMS Northbound log samples and device documentation references for the MG9000 Mgr.

### MG9000 Mgr Fault Interface

#### Fault documentation for MG9000 Mgr :

- NN10074-911 MG9000 Fault Management
- NN10325-900 ATM/IP Fault Management
- NN10275-909 Succession Fault Management Logs Reference

#### Fault Mapping for MG9000 Mgr

The following criteria can be used for looking up information on specific faults for MG9000 Mgr.

##### Fault Correlation for MG9000 Mgr

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                        |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------------------------|
| MG9000 Mgr                | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10074-911<br>MG9000<br>Fault<br>Management |



## Northbound Fault Formats for MG9000 Mgr

### SCC2

The following is an example of a MG9000 Mgr log in SCC2 format:

```
49 MGEM302 4260 TBL MG9K InvalidEMIPAddress
  Location: MG9k EM Comm Network
  Notification Id: 17180020453
  State: Cleared
  Category: communications
  Cause: Communications Subsystem Failure
        Invalid EM IP Address - An invalid EM IP address has been set on the GW
  Component Id: MG9k EM Comm Network
  specificProblem: Invalid EM IP Address - An invalid EM IP address has be
en set on the GW
  Description: An invalid EM IP address has been set on the GW
```

### NTSTD

The following is an example of a MG9000 Mgr log in NTSTD format:

```
RTPU07BR      MGEM302 Jan20 06:49:09 4260 TBL MG9K InvalidEMIPAddress
  Location: MG9k EM Comm Network
  Notification Id: 17180020453
  State: Cleared
  Category: communications
  Cause: Communications Subsystem Failure
        Invalid EM IP Address - An invalid EM IP address has been set on the GW
  Component Id: MG9k EM Comm Network
  specificProblem: Invalid EM IP Address - An invalid EM IP address has be
en set on the GW
  Description: An invalid EM IP address has been set on the GW
```

### SNMP

The following is an example of a MG9000 Mgr log in SNMP format:

```
system.sysUpTime.0 => 20:33:14
iso.org.dod.internet.snmpV2.snmpModules.snmpMIB.snmpMIBObjects.snmpTrap.snmpTrapOID.
0 => nnExtAlarmClear
```

```

alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.19.50.48
.48.52.45.49.45.50.48.44.49.58.52.57.58.57.46.51.44.37279
alarmActiveDateAndTime => 2004-1-20,1:49:9.3,
alarmActiveDescription => An invalid EM IP address has been set on the GW
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 6
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => MGEM302
nnExtAlarmActiveResourceDescription => IEMS=cco4;MG9k EM Comm Network
nnExtAlarmActiveSequenceNumber => 7768

```

## Syslog

The following is an example of a MG9000 Mgr log in Syslog format:

```

Feb 23 12:38:54 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=4317~~ MGEM302 NONE TBL
MG9K InvalidEMIPAddress^M          Location: MG9k EM Comm Network^M          Notification
Id: 17180020453^M          State: Cleared^M          Category: communications^M          Cause:
Communications Subsystem Failure^M          Invalid EM IP Address - An invalid EM IP
address has been set on the GW^M          Component Id: MG9k EM Comm Network^M
specificProblem: Invalid EM IP Address - An invalid EM IP address has be^M          en
set on the GW^M          Description: An invalid EM IP address has been set on the GW

```

## Performance

### XML

The following is an example of performance data for IEMS in XML format:

```

System=Begin
SystemId
NortelNetworks/IEMS

Entity=Begin
EntityId Type
47.142. MG9K Mgr

SubEntity=Begin
SubEntityId
CC04
SubEntity=End

SubEntity=Begin
SubEntityId
CC03
SubEntity=End

SubEntity=Begin
SubEntityId
CC02
SubEntity=End

SubEntity=Begin
SubEntityId
Sefik_CC01
SubEntity=End

SubEntity=Begin
SubEntityId
cco6

Table=Begin
TableId MeasureInterval CaptureTime
nnPmUtil Snapshot 5 2004-11-18T15:45:00EST
Label Label Label Label Label Label Label Label Label
Source nnPmUtil nnPmUtil nnPmUtil nnPmUtil nnPmUtil nnPmUtil nnPmUtil nnPmUtil IntervRamPeak
Value Value Value Value Value Value Value Value Value
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Frame0 0 0 0 0 0 0 0 0 0
Table=End

```

## **OM and PM Documentation references for MG9000 Mgr**

There are no OMs or PMs associated with this component.

## **GUI/CLUI Documentation for MG9000 Mgr**

### **GUI Launching and User procedures**

- NN10096-511 MG9000 Configuration Management

### **Related documents**

- NN10221105 VoA OSS Guide
- NN10162-611 MG9000 Administration and Security
- NN10048-461 Upgrading the MG9000
- NN10276-500 ATM/IP Configuration Management
- NN10325-900 ATM/IP Fault Management

## **Multi-Service Data Manager (MDM)**

This section contains IEMS Northbound log samples and device documentation references for the MDM.

Information in this section also applies to the following Media Gateways: MSS 7400, 15000, 20000. All these devices are closely related and are covered by the same set of customer documentation.

## **MDM Fault Interface**

### **Fault documentation for MDM:**

- 241-6001-011 - MDM Fault Management User Guide
- NN10092-911 - Passport 15000 and MDM in Succession Networks Fault Management
- NN10600-500 - Nortel Networks Multiservice Switch 7400/15000/20000 Alarms Reference
- 241-6001-501 - MDM Proxy Alarms Reference Guide

### **Fault Mapping for MDM**

The following criteria can be used for looking up information on specific faults for MDM.

MDM and Media Gateway devices (6400, 7480, 15000, 20000) use fault code to identify different alarms. Fault codes are eight digits or letters and are grouped by type (first four digits of fault code). Documentation for each fault code group is provided in the following table.

**Fault Documentation for MDM**

| <b>Fault Code Group</b> | <b>Document Reference</b>                                                           |
|-------------------------|-------------------------------------------------------------------------------------|
| <b>0000</b>             | NN10600-500 - Nortel Networks Multiservice Switch 7400/15000/20000 Alarms Reference |
| <b>1100</b>             | NN10600-500 - Nortel Networks Multiservice Switch 7400/15000/20000 Alarms Reference |
| <b>70xx</b>             | NN10600-500 - Nortel Networks Multiservice Switch 7400/15000/20000 Alarms Reference |
| <b>0999</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |
| <b>301x</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |
| <b>50xx</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |
| <b>600x</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |
| <b>A0xx</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |
| <b>B000</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |
| <b>CDxx</b>             | 241-6001-501 - MDM Proxy Alarms Reference Guide                                     |

The faults that are fed northbound from the IEMS use log name and number for distinction. The mapping between log name/number and fault code can be found in the Succession Solution document.

- NN10092-911 - Passport 15000 and MDM in Succession Networks Fault Management (PT-AAL1/UA-AAL1).

**Fault Correlation for MDM**

| <b>NB format -&gt;<br/>Device/EM</b>    | <b>SCC2</b>         | <b>NTSTD</b>        | <b>SNMP</b>         | <b>Syslog</b>       | <b>Document<br/>Reference</b>                                                                      |
|-----------------------------------------|---------------------|---------------------|---------------------|---------------------|----------------------------------------------------------------------------------------------------|
| <b>Multi-Service Data manager (MDM)</b> | log name and number | log name and number | log name and number | log name and number | NN10092-911<br>Passport 15000 and MDM in Succession<br>Networks Fault Management (PT-AAL1/UA-AAL1) |

**Northbound Fault Formats for MDM****SCC2**

The following is an example of a MDM log in SCC2 format:

```
*C22 MDM 303 7891 TBL
time: 2004 01 25 09 22 32
event: set
compId: EM PP14
severity: critical
faultcode: 09990001
alarmType: equipment
commentData: FMDR_SURV@rt pimdm has lost connection to EM PP14. Please in
vestigate.
```

**NTSTD**

The following is an example of a MDM log in NTSTD format:

```
RTPU07BU *** MDM303 Jan25 14:22:32 7345 TBL
time: 2004 01 25 09 22 32
event: set
compId: EM PP14
severity: critical
faultcode: 09990001
alarmType: equipment
commentData: FMDR_SURV@rt pimdm has lost connection to EM PP14. Please in
vestigate.
```

## SNMP

The following is an example of a MDM log in SNMP format:

```
system.sysUpTime.0 => 3 days, 0:41:03
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.53.44.57.58.50.50.58.51.50.46.48.44.13270
alarmActiveDateAndTime => 2004-1-21,6:41:14.0,
alarmActiveDescription => FMDR_SURV@rtipmdm has lost connection to EM PP14.
nnExtAlarmActiveEventType => 4
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => 09990001
nnExtAlarmActiveResourceDescription => IEMS=47.142.116.75-MDM-Mgr_PP14;EM PP14
nnExtAlarmActiveManualClear => 1
nnExtAlarmActiveSequenceNumber => 17433
```

## Syslog

The following is an example of a MDM log in Syslog format:

```
Feb 27 11:16:54 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0402~~ MDM303 CRIT TBL ^M
time: 2004 01 27 11 15 32^M          event: set^M          compId: EM PP14^M          severity:
critical^M          faultcode: 09990001^M          alarmType: equipment^M          commentData:
FMDR_SURV@rtipmdm has lost connection to EM PP14. Please in^M          vestigate.
```

## Performance

### OM and PM Documentation references for MDM

- 241-6001-806 - MDM MDP Data Formats Reference Guide

### Northbound OM/PM Formats

Performance measurements for MDM are available only from the MDM directly. For more information on MDM, MSS 7000, and MSS 15000 OM, see 241-6001-806 - MDM MDP Data Formats Reference Guide

## XML

The following is an example of Performance data for MDM in XML format:

*Note: The IEMS northbound performance interface does not support this device.*







[illegible]

```
3,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,EM/HATTERAS SHELF  
CARD/9,0,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
```

Table=End

Entity=End

System=End

PMFile=End

### **BDF**

The MDM provides a Bulk Data Format option for PM data as well as the CSV file format. The BDF format and reference information can be found in the Preside MDM MDP Data Formats Reference Guide.

## **GUI/CLUI Documentation for MDM**

### **GUI Launching and User procedures**

The following documents provide specific details about the various user interfaces provided by the MDM.

- 241-6001-801 - MDM Overview
- 241-6001-011 - MDM Fault Management User Guide
- 241-6001-013 - MDM Remote Network Communication System User Guide
- 241-6001-015 - MDM Network Model Administrator Guide
- 241-6001-022 - MDM Network Reporting System User Guide
- 241-6001-023 - MDM Configuration Management for Passport User Guide
- 241-6001-030 - MDMWeb User Guide
- 241-6001-031 - MDM Performance Management User Guide
- 241-6001-040 - MDM Security User Guide

### **Related documents**

Numerous documents are available on MDM installation, configuration, and planning. All the documents in the **241-6001-xxx** series are related to the MDM and its operations.

- NN10028-111 - Passport 15000 and MDM in Succession Networks Product and Technology Fundamentals (PT-AAL1/U)
- NN10070-461 - Passport 15000 and MDM in Succession Networks Upgrade Guide (PT-AAL1/UA-AAL1)
- NN10092-911 - Passport 15000 and MDM in Succession Networks Fault Management Overview (PT-AAL1/UA-AAL1)
- NN10114-511 - Passport 15000 and MDM in Succession Networks Configuration Overview (PT-AAL1/UA-AAL1)
- NN10158-711 - Passport 15000 and MDM in Succession Networks Performance (PT-AAL1/UA-AAL1)
- NN10180-611 - Passport 15000 and MDM in Succession Networks Security and Administration (PT-AAL1/UA-AAL1)
- NN10185-461 - MDM in Succession Networks Upgrade Guide (PT-AAL1/UA-AAL1)
- NN10198-912 - Passport 15000 and MDM in Succession Networks Fault Management Troubleshooting (PT-AAL1/UA-A)
- NN10225-512 - Passport 15000 and MDM in Succession Networks Configuration Attribute Summary (PT-AAL1/UA-AA)

## **SAM21 Element Manager**

This section contains IEMS Northbound log samples and device documentation references for the SAM21 EM.

### **SAM21 EM Fault Interface**

#### **Fault documentation for SAM21 EM:**

The SAM 21 Manager reports faults for the SAM 21 Shelf Controller. Please refer to the SAM 21 SC documents below for details about SAM 21 faults.

- NN10089-911 - SAM21 Shelf Controller Fault Management

#### **Fault Mapping for SAM21 EM**

The following criteria can be used for looking up information on specific faults for SAM21 EM.

**Fault Correlation for SAM21 EM**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>           | <b>NTSTD</b>          | <b>SNMP</b>           | <b>Syslog</b>         | <b>Document<br/>Reference</b>                                   |
|--------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------------------------------------------------|
| <b>SAM21 Mgr</b>                     | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10089-911<br>SAM21 Shelf<br>Controller<br>Fault<br>Management |

**Northbound Fault Formats for SAM21 EM****SCC2**

The following is an example of a SAM21 EM log in SCC2 format:

```
**37 SCU 350 0009 FLT Alarm Raised
Location: SAM21 1:CSAM01-01:sled 3
Time:      Wed Jan 14 13:55:52 EST 2004
Reason:    Temperature in Sled 3 is high
```

**NTSTD**

The following is an example of a SAM21 EM log in NTSTD format:

```
COMPACT06BT ** SCU350 Jan15 00:37:17 0009 FLT Alarm Raised
Location: SAM21 1:CSAM01-01:sled 3
Time:      Wed Jan 14 13:55:52 EST 2004
Reason:    Temperature in Sled 3 is high
```

**SNMP**

The following is an example of a SAM21 EM log in SNMP format:

```
sysUpTime.0 => 9:14:20
snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.51.44.51.58.49.52.58.51.56.46.48.44.42847
alarmActiveDateAndTime => 2004-1-23,3:14:38.0,
alarmActiveDescription => Temperature in Sled 3 is high.
Time:      Wed Jan 14 13:57:48 EST 2004
```

Reason: Temperature in Sled 3 is high

```
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => SCU 350
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0kz.us.nortel.com-SAM21-Mgr;
nnExtAlarmActiveManualClear => 2
nnExtAlarmActiveSequenceNumber => 1
```

## Syslog

The following is an example of a SAM21 EM log in Syslog format:

```
Feb 12 18:30:19 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=7929~~ SCU350 MAJOR FLT
Alarm Raised^M          Location: SAM21 1:CSAM01-01:sled 3^M          Time:      Mon Jan 12
12:49:06 EST 2004^M      Reason:      Temperature in Sled 3 is high
```

## Performance

### OM and PM Documentation references for SAM21 EM

NN10155-711

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

## XML

The following is an example of performance data for SAM21 EM in XML format:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <PMFile xmlns:xsi="http://www.w3.org/2000/10/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="commonFormat.xsd" MeasurementCategory="PM">
  <FileCreationTime>2005-02-09T12:00:26EST</FileCreationTime>
- <System>
  <SystemId>NortelNetworks/IEMS</SystemId>
- <Entity Type="SAM21">
  <EntityId>47.142.106.30</EntityId>
- <SingleValues MeasurementKind="Snapshot" IntervalDuration="30">
- <SingleValue>
```

```
<CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
<MeasureId>rxedTimeoutCount</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
  <Value>0</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
  <MeasureId>bytesSentPerSec</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
  <Value>23</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
  <MeasureId>totalBytesRxed</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
  <Value>14792</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
  <MeasureId>totalBytesSent</MeasureId>

<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
  <Value>16765</Value>
  <Reliability>Valid</Reliability>
</SingleValue>
- <SingleValue>
  <CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
  <MeasureId>oversizedPDUCount</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se  
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
```

```
<Value>0</Value>
```

```
<Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
<CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
```

```
<MeasureId>bytesRxdPerSec</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se  
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
```

```
<Value>20</Value>
```

```
<Reliability>Valid</Reliability>
```

```
</SingleValue>
```

```
- <SingleValue>
```

```
<CaptureTime>2005-02-09T12:00:02EST</CaptureTime>
```

```
<MeasureId>cellDropCount</MeasureId>
```

```
<MeasureSuppId1>.iso.org.dod.internet.private.enterprises.nortel.voip.ptn.se  
rviceControl.scu.scuMessaging.ipoaMIB</MeasureSuppId1>
```

```
<Value>0</Value>
```

## CSV

The following is an example of performance data for SAM21 EM in CSV format:

```
PMFile=Begin
```

```
MeasurementCategory,noNamespaceSchemaLocation,FileCreationTime
```

```
PM,commonFormat.xsd,2005-02-09T12:00:26EST
```

```
System=Begin
```

```
SystemId
```

```
NortelNetworks/IEMS
```

```
Entity=Begin
```

```
EntityId,Type
```

```
47.142.106.30,SAM21
```



```
SingleValues=Begin
MeasurementKind, IntervalDuration
Snapshot, 30
MeasureId, CaptureTime, MeasureSuppId1, Value, Reliability
rxedTimeoutCount, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 0, Valid
bytesSentPerSec, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 23, Valid
totalBytesRxed, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 14792, Valid
totalBytesSent, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 16765, Valid
oversizedPDUCount, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 0, Valid
bytesRxedPerSec, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 20, Valid
cellDropCount, 2005-02-
09T12:00:02EST, .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.ser
viceControl.scu.scuMessaging.ipoaMIB, 0, Valid
SingleValues=End

Entity=End

System=End

PMFile=End
```

## **GUI/CLUI Documentation for SAM21 EM**

### **GUI Launching and User procedures**

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics
- NN10281-600 - ATM/IP Administration and Security

**Related documents**

- NN10089-911 - SAM21 Shelf Controller Fault Management
- NN10325-900 - ATM/IP Fault Management
- NN10276-500 - ATM/IP Configuration Management

# Applications

## Audio Provisioning Server (APS)

This section contains IEMS Northbound log samples and device documentation references for the APS.

### APS Fault Interface

**Fault documentation for APS:**

- NN10328-911 - MS 2000 Series Fault Management

**Fault Mapping for APS**

The following criteria can be used for looking up information on specific faults for APS.

**Fault Correlation for APS**

| NB format -><br>Device/EM | SCC2            | NTSTD           | SNMP            | Syslog          | Document<br>Reference                                |
|---------------------------|-----------------|-----------------|-----------------|-----------------|------------------------------------------------------|
| APS                       | SpecificProblem | SpecificProblem | SpecificProblem | SpecificProblem | NN10328-911<br>MS 2000<br>Series Fault<br>Management |

### Northbound Fault Formats for APS

**SCC2**

The following is an example of a APS log in SCC2 format:

```
*C02 APS 398 2759 TBL APS Fault
Location: rtp2aps
Notification Id: 28673
```

State: Raise  
Category: communications  
Cause: softwareError  
Time: Jan 27 07:02:30 2004  
Component Id: APS;APSUnit=nc0rtp170;Software=Audio\_Management\_0  
Specific Problem: 28673  
Description: DB is not available, or the user cannot get a connection to the DB

## NTSTD

The following is an example of a APS log in NTSTD format:

```
RTPU07BR *** APS398 Jan27 12:02:30 2207 TBL APS Fault
Location: rtp2aps
Notification Id: 28673
State: Raise
Category: communications
Cause: softwareError
Time: Jan 27 07:02:30 2004
Component Id: APS;APSUnit=nc0rtp170;Software=Audio_Management_0
Specific Problem: 28673
Description: DB is not available, or the user cannot get a connection to the DB
```

## SNMP

The following is an example of a APS log in SNMP format:

```
sysUpTime.0 => 2 days, 18:44:37
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.18.50.48
.48.52.45.49.45.50.55.44.5
5.58.49.58.54.46.48.44.11202
alarmActiveDateAndTime => 2004-1-27,7:1:6.0
alarmActiveDescription => DB is not available, or the user cannot get a connection to the DB
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
```

```
nnExtAlarmActiveAdditionalText =>  
nnExtAlarmActiveDocumentationPointer => APS 398  
nnExtAlarmActiveResourceDescription => IEMS=znc0s0j6-SSPFS-Unit-  
0;APS;APSUnit=nc0rtp170;Software=Audio_Management_0  
nnExtAlarmActiveManualClear => 4  
nnExtAlarmActiveSequenceNumber => 13458
```

## Syslog

The following is an example of a APS log in Syslog format:

```
Feb 27 07:02:24 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=6645~~ APS398 CRIT TBL APS  
Fault^M      Location: rtp2aps^M      NotificationID: 28673^M      State: Raise^M  
Category: Communications^M      Cause: Software error^M      Time: Jan 27 07:02:30  
2004^M      Component Id: APS;APSUnit=nc0rtp170;Software=Audio_Management_0^M  
Specific Problem: 28673^M      Description: DB is not available, or the user cannot  
get a connection to^M      the DB^M
```

## Performance

### OM and PM Documentation references for APS

- NN10331-711 - MS 2000 Series Performance Monitoring

### Northbound OM/PM Formats

#### XML

The following is an example of performance data for APS in XML format:

***Note:** Northbound performance interface not supported for this component.*

#### CSV

The following is an example of performance data for APS in CSV format:

***Note:** Northbound performance interface not supported for this component.*

## GUI/CLUI Documentation for APS

### GUI Launching and User procedures

- NN10340-511 - MS 2000 Series Configuration Management

### Related documents

- NN10320-100 - ATM Solutions Basics

- NN10300-100 - IP Solutions Basics

## **Line Maintenance Manager (LMM)**

This section contains IEMS Northbound log samples and device documentation references for LMM.

### **LMM Fault Interface**

#### **Fault documentation for LMM:**

There are no faults or logs associated with this application.

#### **Fault Mapping for LMM**

There are no faults or logs associated with this application.

### **Performance**

There are no OMs or PMs associated with this application.

### **GUI/CLUI Documentation for LMM**

#### **GUI Launching and User procedures**

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics

#### **Related documents**

## **Network Patch Manager (NPM)**

This section contains IEMS Northbound log samples and device documentation references for the Network Patch Manager (NPM).

### **NPM Fault Interface**

#### **Fault documentation for NPM:**

- NN10325-900 - ATM/IP Fault Management

#### **Fault Mapping for NPM**

The following criteria can be used for looking up information on specific faults for NPM.

**Fault Correlation for NPM**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>        | <b>NTSTD</b>       | <b>SNMP</b>        | <b>Syslog</b>      | <b>Document Reference</b>              |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|----------------------------------------|
| <b>NPM</b>                           | logname and number | logname and number | logname and number | logname and number | NN10325-900<br>ATM/IP Fault Management |

**Northbound Fault Formats for NPM****SCC2**

The following is an example of an NPM log in SCC2 format:

```
38 NPM 360 6012 INFO Alarm Raised
Alarm ACT_NOT_APP has been raised.
Alarm Description: Activatable patches not applied.
```

**NTSTD**

The following is an example of an NPM log in NTSTD format:

```
RTPU07BU      NPM360 Jan27 15:38:44 5466 INFO Alarm Raised
Alarm ACT_NOT_APP has been raised.
Alarm Description: Activatable patches not applied.
```

**SNMP**

The following is an example of an NPM log in SNMP format:

```
system.sysUpTime.0 => 2 days, 22:22:15
snmpTrapOID.0 => nnExtAlarmMessage
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=znc0s0j6-SSPFS-Unit-0;
nnExtAlarmMessageDateAndTime => 2004-1-27,10:38:44.0
nnExtAlarmMessageDocumentationPointer => NPM 360
nnExtAlarmMessageInfo => 38 NPM 360 6012 INFO Alarm Raised           Alarm
ACT_NOT_APP has been raised.

Alarm Description: Activatable patches not applied.
```

## Syslog

The following is an example of an NPM log in Syslog format:

```
Feb 27 10:40:03 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0201~~ NPM360 NONE INFO
Alarm Raised^M          Alarm ACT_NOT_APP has been raised.^M      Alarm Description:
Activatable patches not applied.
```

## Performance

### OM and PM Documentation references for NPM

There are no OMs or PMs associated with this application.

### GUI/CLUI Documentation for NPM

#### GUI Launching and User procedures

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics
- NN10276-500 - ATM/IP Configuration Management

#### Related documents

- NN10281-600 - ATM/IP Administration and Security
- NN10440-450 - Upgrading a Carrier VoIP Network

## OSSGate

This section contains IEMS Northbound log samples and device documentation references for the OSSGate.

### OSSGate Fault Interface

#### Fault documentation for OSSGate :

There are no faults or logs associated with this application.

#### Fault Mapping for OSSGate

There are no faults or logs associated with this application.

## Performance

### OM and PM Documentation references for OSSGate

There are no OMs or PMs associated with this application.

### Northbound OM/PM Formats

There are no OMs or PMs associated with this application.

## GUI/CLUI Documentation for OSSGate

### GUI Launching and User procedures

- NE10004-512 OSSGate User's Guide

### Related documents

- 297-9051-8081 SERVORD Reference Manual Vol 1 of 2
- 297-9051-8082 SERVORD Reference Manual Vol 2 of 2

## QoS Collector Application (QCA)

This section contains IEMS Northbound log samples and device documentation references for the QCA.

## QCA Fault Interface

### Fault documentation for QCA :

The QoS Collector reports faults as part of the CS2K Management Tools suite. The documents below contain information about QoS Collector faults.

- NN10083-911 - Communication Server 2000 Fault Management

### Fault Mapping for QCA

The following criteria can be used for looking up information on specific faults for QCA.

#### Fault Correlation for QCA

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                                              |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|--------------------------------------------------------------------|
| QCA                       | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10083-911<br>Communication<br>Server 2000<br>Fault<br>Management |



## Northbound Fault Formats for QCA

### SCC2

The following is an example of a QCA log in SCC2 format:

```
*C34 QCA 310 0052 TBL wnc0y0kz
  Location: wnc0y0kz
  NotificationID : 49
  State : Raise
  Category : Processing Error
  Cause : storageCapacityProblem
  Time : Jan 22 16:34:19 2004
  Component Id: /data/qca
  Specific Problem: checkDiskSpace() has shown that there is less than
  104857600 bytes available on the local disk.
  Description : More Disk space is required immediately.
```

### NTSTD

The following is an example of a QCA log in NTSTD format:

```
COMPACT06BT *** QCA 310 Jan22 21:34:19 0052 TBL wnc0y0kz
  Location: wnc0y0kz
  NotificationID : 49
  State : Raise
  Category : Processing Error
  Cause : storageCapacityProblem
  Time : Jan 22 16:34:19 2004
  Component Id: /data/qca
  Specific Problem: checkDiskSpace() has shown that there is less than
  104857600 bytes available on the local disk.
  Description : More Disk space is required immediately.
```

### SNMP

The following is an example of a QCA log in SNMP format for a raise alarm:

```
system.sysUpTime.0 => 0:28:36
snmpTrapOID.0 => nnExtAlarmCritical
```

```

alarmActiveResourceId =>
1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.2
8.50.48.48.53.45.48.57.45.48.55.44.49.57.58.53.55.58.51.56.46.48.44.45.48.52
.58.48.48.140819
alarmActiveDateAndTime => 2004-1-22,4:34:20.0,
alarmActiveDescription => If 10 (or more) records with unsupported version are
received consecutively, Major fault log is generated and the connection is
closed
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 166
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => QCA 301
nnExtAlarmActiveResourceDescription => IEMS=rtp4cmt-QOS
nnExtAlarmActiveManualClear => 4
nnExtAlarmActiveSequenceNumber => 3

```

The following is an example of a QCA log in SNMP format for a clear alarm:

```

system.sysUpTime.0 => 0:28:36
snmpTrapOID.0 =>
alarmActiveResourceId =>
1.3.6.1.2.1.118.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.2
8.50.48.48.53.45.48.57.45.48.55.44.49.57.58.53.55.58.51.56.46.48.44.45.48.52
.58.48.48.140819
alarmActiveDateAndTime => 2004-1-22,4:34:20.0,
alarmActiveDescription => If 10 (or more) records with unsupported version are
received consecutively, Major fault log is generated and the connection is
closed
nnExtAlarmActiveEventType => 1
nnExtAlarmActiveProbableCause => 1024
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => QCA 399
nnExtAlarmActiveResourceDescription => IEMS=rtp4cmt-QOS
nnExtAlarmActiveManualClear => 4
nnExtAlarmActiveSequenceNumber => 3

```

## Syslog

The following is an example of a QCA log in Syslog format:

```

Feb 22 16:34:19 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0062~~ QCA310 CRIT TBL
wnc0y0kz^M      Location: wnc0y0kz^M      NotificationID : 49^M      State :
Raise^M      Category : Processing Error^M      Cause : storageCapacityProblem^M
Time : Jan 22 16:26:49 2004^M      Component Id: /data/qca^M      Specific Problem:

```

checkDiskSpace() has shown that there is less than^M 104857600 bytes available  
on the local disk.^M Description : More Disk space is required immediately.^M

## Performance

### OM and PM Documentation references for QCA

- There are no OMs or PMs associated with QCA.

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of Performance data for QCA in XML format:

***Note:** Northbound performance interface not supported for this component.*

#### CSV

The following is an example of Performance data for QCA in CSV format:

***Note:** Northbound performance interface not supported for this component.*

## GUI/CLUI Documentation for QCA

### GUI Launching and User procedures

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics
- NN10281-600 - ATM/IP Administration and Security
- NN10325-900 - ATM/IP Fault Management
- NN10276-500 - ATM/IP Configuration Management

### Related documents

## Trunk Maintenance Manager (TMM)

This section contains IEMS Northbound log samples and device documentation references for TMM.

## **TMM Fault Interface**

### **Fault documentation for TMM :**

There are no faults or logs associated with this application.

### **Fault Mapping for TMM**

There are no faults or logs associated with this application.

## **Performance**

### **OM and PM Documentation references for TMM**

There are no OMs or PMs associated with this application.

## **GUI/CLUI Documentation for TMM**

### **GUI Launching and User procedures**

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics

### **Related documents**

## Non-Topology Elements

This section contains references to applications that do not appear in the IEMS topology, but still report faults to the Northbound log streams.

### Data Audit System

This section contains IEMS Northbound log samples and device documentation references for the Data Audit System.

#### Data Audit System Fault Interface

##### Fault documentation for Data Audit System :

- NN10325-900 - ATM/IP Fault Management

##### Fault Mapping for Data Audit System

The following criteria can be used for looking up information on specific faults for Data Audit System.

##### Fault Correlation for Data Audit System

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                     |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------------------|
| Data Audit<br>System      | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10325-900<br>ATM/IP Fault<br>Management |

#### Northbound Fault Formats for Data Audit System

##### SCC2

The following is an example of a Data Audit System log in SCC2 format:

```
*C43 CMT 300 5341 TBL CMT Fault
Location: Audit
NotificationID: 1001
State: Raise
Category: Processing Error
Cause: Corrupt data
Time: Jan 23 13:43:37 2004
Component Id: SESM=AuditSystem;Audit=CS2K Data Integrity Audit
Specific Problem: Data mismatches detected
Description: The SESM audit: CS2K Data Integrity Audit, has 59 unresolv
d problems. To view and correct the problems, open the audit problem rep
ort from the Audit System found under the SESM Maintenance menu item.
```

## NTSTD

The following is an example of a Data Audit System log in NTSTD format:

```
COMPACT06BT *** CMT300 Jan23 18:43:37 5341 TBL CMT Fault
  Location: Audit
  NotificationID: 1001
  State: Raise
  Category: Processing Error
  Cause: Corrupt data
  Time: Jan 23 13:43:37 2004
  Component Id: SESM=AuditSystem;Audit=CS2K Data Integrity Audit
  Specific Problem: Data mismatches detected
  Description: The SESM audit: CS2K Data Integrity Audit, has 59 unresolv
d problems. To view and correct the problems, open the audit problem rep
ort from the Audit System found under the SESM Maintenance menu item.
```

## SNMP

The following is an example of a Data Audit System log in SNMP format:

```
system.sysUpTime.0 => 21:39:13
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.51.44.49.58.52.51.58.51.55.46.48.44.42485
alarmActiveDateAndTime => 2004-1-23,1:43:37.0,
alarmActiveDescription => The SESM audit: CS2K Data Integrity Audit, has 59 unresolved
problems. To view and correct the problems, open the audit problem report from the
Audit System found under the SESM Maintenance menu item.
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => CMT 300
nnExtAlarmActiveResourceDescription => IEMS=znc0s0j6;SESM=AuditSystem;Audit=CS2K Data
Integrity Audit
nnExtAlarmActiveManualClear => 0
nnExtAlarmActiveSequenceNumber => 8390
```

## Syslog

The following is an example of a Data Audit System log in Syslog format:

```
Feb 23 13:44:54 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=5398~~ CMT300 CRIT TBL CMT
Fault^M Location: Audit^M NotificationID: 1001^M State: Raise^M Category: Processing
Error^M Cause: Corrupt data^M Time: Jan 23 13:43:37 2004^M Component Id:
SESM=AuditSystem;Audit=CS2K Data Integrity Audit^M Specific Problem: Data mismatches
detected^M Description: The SESM audit: CS2K Data Integrity Audit, has 59 unresolv^M
d problems. To view and correct the problems, open the audit problem rep^M ort from
the Audit System found under the SESM Maintenance menu item.^M
```

## Performance

### OM and PM Documentation references for Data Audit System

There are no OMs or PMs associated with this application.

### Northbound OM/PM Formats

There are no OMs or PMs associated with this application.

## GUI/CLUI Documentation for Data Audit System

### GUI Launching and User procedures

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics
- NN10276-500 - ATM/IP Configuration Management
- NN10325-900 - ATM/IP Fault Management

### Related documents

## IW-SPM IP

This section contains IEMS Northbound log samples and device documentation references for the IW-SPM IP.

### IW-SPM IP Fault Interface

#### Fault documentation for IW-SPM IP :

- NN10078-911 - IW SPM IP Fault Management
- NN10275-909 - Succession Fault Management Logs Reference

### Fault Mapping for IW-SPM IP

The following criteria can be used for looking up information on specific faults for IW-SPM IP.

#### Fault Correlation for IW-SPM IP

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                           |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------------------------------|
| IW-SPM IP                 | Logname and<br>number | Logname and<br>number | Logname and<br>number | Logname and<br>number | NN10078-911<br>IW SPM IP<br>Fault<br>Management |

## Northbound Fault Formats for IW-SPM IP

### SCC2

The following is an example of a IW-SPM IP log in SCC2 format:

```
**17 SPM 313 4488 TBL Fault
      SPM    0 CEM    0 : A                               Time: 12:16:13.890
      Source: None           State: Insv           Type: None
      Reason:      Loadname mismatch.
      Diagnostic: Autonomous fault detection
      Comp:MCM           RegAddr:0           Exp:0           Act:0
```

### NTSTD

The following is an example of a IW-SPM IP log in NTSTD format:

```
RTPU07BU ** SPM313 Feb28 00:06:14 9091 TBL Fault
      SPM    0 CEM    1 : A                               Time: 19:05:14.820
      Source: None           State: Insv           Type: None
      Reason:      SYNC OOSpec: prim. ref. NA.
      Diagnostic: Autonomous fault detection
      Comp:TIC           RegAddr:0           Exp:0           Act:0
```

### SNMP

The following is an example of a IW-SPM IP log in SNMP format:

```
system.sysUpTime.0 => 3 days, 6:54:40
snmpTrapOID.0 => nnExtAlarmMajor
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.50.45.50.55.44.55.58.49.50.58.50.55.46.54.44.14023
alarmActiveDateAndTime => 2004-2-27,7:12:27.6
alarmActiveDescription => No frame pulse from DS-512 #0
Time: 19:11:31.010
Source: None           State: Insv           Type: None
Reason:      SYNC OOSpec: prim. ref. NA.
Diagnostic: Autonomous fault detection
Comp:TIC           RegAddr:0           Exp:0           Act:0
```



```

nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => SPM 313
nnExtAlarmActiveResourceDescription => IEMS=wnc0y0m0.us.nortel.com-CS2K-Mgr;
nnExtAlarmActiveManualClear => 3
nnExtAlarmActiveSequenceNumber => 18489

```

## Syslog

The following is an example of a IW-SPM IP log in Syslog format:

```

Feb 28 12:11:09 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=7983~~ SPM313 MAJOR TBL
Fault^M      SPM 0 CEM 1 : I      Time: 12:10:11.080^M      Source:
None      State: Insv      Type: None ^M      Reason:      No frame pulse from
DS-512 #0 ^M      Diagnostic: Autonomous fault detection ^M      Comp:TIC
RegAddr:0      Exp:0      Act:0

```

## Performance

### OM and PM Documentation references for IW-SPM IP

- NN10144-711 - IW SPM IP Performance Management

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of Performance data for IW-SPM IP in XML format:

***Note:** The IEMS northbound performance interface does not support this device.*

#### CSV

The following is an example of Performance data for IW-SPM IP in CSV format:

***Note:** The IEMS northbound performance interface does not support this device.*

## GUI/CLUI Documentation for IW-SPM IP

### GUI Launching and User procedures

- NN10015-111 - IW SPM IP Basics

### Related documents

- NN10056-461 - Upgrading the IW SPM IP
- NN10100-511 - IW SPM IP Configuration Management
- NN10166-611 - IW SPM IP Administration and Security

## MG9000 Manager Mid-Tier

This section contains IEMS Northbound log samples and device documentation references for the MG9000 Mgr Mid-Tier.

### MG9000 Mgr Mid-Tier Fault Interface

#### Fault documentation for MG9000 Mgr Mid-Tier:

All MG9000 Mgr Mid-Tier faults are delivered via MG9000 Mgr. See document(s)

- NN10074-911 MG9000 Fault Management
- NN10325-900 ATM/IP Fault Management
- NN10275-909 Succession Fault Management Logs Reference

#### Fault Mapping for MG9000 Mgr Mid-Tier

The following criteria can be used for looking up information on specific faults for MG9000 Mgr Mid-Tier.

##### Fault Correlation for MG9000 Mgr Mid-Tier

| NB format -><br>Device/EM | SCC2                | NTSTD               | SNMP                | Syslog              | Document<br>Reference                        |
|---------------------------|---------------------|---------------------|---------------------|---------------------|----------------------------------------------|
| MG9K Mid-Tier             | log name and number | log name and number | log name and number | log name and number | NN10074-911<br>MG9000<br>Fault<br>Management |

## Northbound Fault Formats for MG9000 Mgr Mid-Tier

### SCC2

The following is an example of a MG9000 Mgr Mid-Tier log in SCC2 format:

```
52 MGEM703 0193 INFO Shutdown_Event
Status: Shutting MG 9K Midtier Server down ...
```

### NTSTD

The following is an example of a MG9000 Mgr Mid-Tier log in NTSTD format:

```
RTPU07BT      MGEM703 Feb02 20:52:08 0197 INFO Shutdown_Event
Status: Shutting MG 9K Midtier Server down ...
```

### SNMP

The following is an example of a MG9000 Mgr Mid-Tier log in SNMP format:

```
sysUpTime.0 => 1:30:14
snmpTrapOID.0 => nnExtAlarmMessage
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=wnc0y0nr.us.nortel.com-SSPFS-Unit-0;
nnExtAlarmMessageDateAndTime => 2004-2-2,3:52:8.0
nnExtAlarmMessageDocumentationPointer => MGEM703
nnExtAlarmMessageInfo => 52 MGEM703 0193 INFO Shutdown_Event      Status:
Shutting MG 9K Midtier Server down ...
```

### Syslog

The following is an example of a MG9000 Mgr Mid-Tier log in Syslog format:

```
Mar  4 15:27:47 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=0682~~ MGEM703 NONE INFO
Shutdown_Event
Status: Shutting MG 9K Midtier Server down ...
```

## Performance

### OM and PM Documentation references for MG9000 Mgr Mid-Tier

There are no OMs or PMs associated with this component.

## GUI/CLUI Documentation for MG9000 Mgr Mid-Tier

### GUI Launching and User procedures

The MG9000 Mgr Mid-Tier is an application that runs on an SSPFS machine. See SSPFS platform for client launch details.

- NN10096-511 MG9000 Configuration Management

### Related documents

- NN10221105 VoA OSS Guide
- NN10048-461 Upgrading the MG9000
- NN10276-500 ATM/IP Configuration Management
- NN10325-900 ATM/IP Fault Management
- NN10162-611 MG9000 Administration and Security

## OM Collector

### OM Collector Fault Interface

This section contains IEMS Northbound log samples and device documentation references for the OM Collector.

#### Fault documentation for OM Collector:

- NN10074-911 MG9000 Fault Management

#### Fault Mapping for OM Collector

- NN10074-911 MG9000 Fault Management

The following criteria can be used for looking up information on specific faults for OM Collector.

#### Fault Correlation for OM Collector

| NB format -><br>Device/EM | SCC2                  | NTSTD                 | SNMP                  | Syslog                | Document<br>Reference                        |
|---------------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------------------------------|
| OM<br>Collector           | logname and<br>number | logname and<br>number | logname and<br>number | logname and<br>number | NN10074-911<br>MG9000<br>Fault<br>Management |

## Northbound Fault Formats for OM Collector

### SCC2

The following is an example of a OM Collector log in SCC2 format:

```
27 OMC 700 0470 INFO Startup_Event
Status: OMCLTR_Process: OMCollector Process was started with PSID 17585
```

### NTSTD

The following is an example of a OM Collector log in NTSTD format:

```
RTPU07BR      OMC700 Jan28 21:27:53 9923 INFO Startup_Event
Status: OMCLTR_Process: OMCollector Process was started with PSID 17585
```

### SNMP

The following is an example of a OM Collector log in SNMP format:

```
system.sysUpTime.0 => 4 days, 4:10:00
snmpTrapOID.0 => nnExtAlarmMessage
nnExtAlarmMessageResource => .0.0
nnExtAlarmMessageResourceDescription => IEMS=wnc0s0kq.us.nortel.com-SSPFS-Unit-0;
nnExtAlarmMessageDateAndTime => 2004-1-28,4:27:53.0
nnExtAlarmMessageDocumentationPointer => OMC 700
nnExtAlarmMessageInfo => 27 OMC 700 0470 INFO Startup_Event
Status: OMCLTR_Process: OMCollector Process was started with PSID 17585
```

### Syslog

The following is an example of a OM Collector log in Syslog format:

```
Feb 28 16:27:48 wnc0s0pf IEMS: _V2_~I=~H=wnc0s0pf~A=IEMS~S=4656~~ OMC700 NONE INFO
Startup_Event^M      Status: OMCLTR_Process: OMCollector Process was started with
PSID 17585
```

## Performance

### OM and PM Documentation references for OM Collector

There are no OMs or PMs associated with this application. For MG9000 performance information see:

- NN10140-711 MG9000 Performance Management

### **Northbound OM/PM Formats**

There are no OMs or PMs associated with this application.

## **GUI/CLUI Documentation for OM Collector**

### **GUI Launching and User procedures**

- NN10140-711 MG9000 Performance Management
- NN10096-511 MG9000 Configuration Management

### **Related documents**

- NN10276-500 ATM/IP Configuration Management

## **V5.2 Data Audit**

This section contains IEMS Northbound log samples and device documentation references for the V5.2 Data Audit.

### **V5.2 Data Audit Fault Interface**

#### **Fault documentation for V5.2 Data Audit:**

The V5.2 Data Integrity Audit Module of V5.2 Data Audit will raise CMT300 faults, and it will be covered in **DataAudit**'s Fault Management.

The Data Audit system will generate CMT300 logs when problems are found during any of its audits. The component ID of the log can be used to identify the specific audit that encountered a problem.

- NN10275-909 - Succession Fault Management Logs Reference
- NN10325-900 - ATM/IP Fault Management

#### **Fault Mapping for V5.2 Data Audit**

The following criteria can be used for looking up information on specific faults for V5.2 Data Audit.

**Fault Correlation for V5.2 Data Audit**

| <b>NB format -&gt;<br/>Device/EM</b> | <b>SCC2</b>                                                                                                                                           | <b>NTSTD</b>                                                                                                                                          | <b>SNMP</b>                                                                                                                                           | <b>Syslog</b>                                                                                                                                         | <b>Document Reference</b>                              |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>V5.2 Data Audit</b>               | log name and log number.<br>Seen as component ID in generic CMT300 Audit log. example: componentid = SESM=AuditSystem;Audit=V5.2 Data Integrity Audit | log name and log number.<br>Seen as component ID in generic CMT300 Audit log. example: componentid = SESM=AuditSystem;Audit=V5.2 Data Integrity Audit | log name and log number.<br>Seen as component ID in generic CMT300 Audit log. example: componentid = SESM=AuditSystem;Audit=V5.2 Data Integrity Audit | log name and log number.<br>Seen as component ID in generic CMT300 Audit log. example: componentid = SESM=AuditSystem;Audit=V5.2 Data Integrity Audit | NN10275-909 Succession Fault Management Logs Reference |

**Northbound Fault Formats for V5.2 Data Audit****SCC2**

The following is an example of a V5.2 Data Audit log in SCC2 format:

```
*C12 CMT 300 0002 TBL CMT Fault
Location: Audit
NotificationID: 1002
State: Raise
Category: Processing Error
Cause: Corrupt data
Time: Feb 14 23:12:48 2004
Component Id: SESM=AuditSystem;Audit=V5.2 Data Integrity Audit
Specific Problem: Data mismatches detected
Description: The SESM audit: V5.2 Data Integrity Audit, has 5 unresolved
problems. To view and correct the problems, open the audit problem report
from the Audit System found under the SESM Maintenance menu item.
```

**NTSTD**

The following is an example of a V5.2 Data Audit log in NTSTD format:

```
COMPACT06BT *** CMT300 Feb15 07:12:48 0002 TBL CMT Fault
```

Location: Audit  
 NotificationID: 1002  
 State: Raise  
 Category: Processing Error  
 Cause: Corrupt data  
 Time: Feb 14 23:12:48 2004  
 Component Id: SESM=AuditSystem;Audit=V5.2 Data Integrity Audit  
 Specific Problem: Data mismatches detected  
 Description: The SESM audit: V5.2 Data Integrity Audit, has 5 unresolved problems. To view and correct the problems, open the audit problem report from the Audit System found under the SESM Maintenance menu item.

## SNMP

The following is an example of a V5.2 Data Audit log in SNMP format:

```

system.sysUpTime.0 => 3:05:01
snmpTrapOID.0 => nnExtAlarmCritical
alarmActiveResourceId =>
.1.3.6.1.2.1.111.1.2.2.1.10.12.78.111.114.116.101.108.95.102.97.117.108.116.20.50.48
.48.52.45.49.45.50.49.44.54.58.52.49.58.49.52.46.48.44.8995
alarmActiveDateAndTime => 2004-1-21,6:41:14.0,
alarmActiveDescription => The SESM audit: V5.2 Data Integrity Audit, has 5 unresolved
problems. To view and correct the problems, open the audit problem report from the
Audit System found under the SESM Maintenance menu item.
nnExtAlarmActiveEventType => 5
nnExtAlarmActiveProbableCause => 118
nnExtAlarmActiveAdditionalText =>
nnExtAlarmActiveDocumentationPointer => CMT 300
nnExtAlarmActiveResourceDescription => IEMS=zsups228;SESM=AuditSystem;Audit=V5.2 Data
Integrity Audit
nnExtAlarmActiveManualClear => 2
nnExtAlarmActiveSequenceNumber => 1
  
```

## Syslog

The following is an example of a V5.2 Data Audit log in Syslog format:

```

Feb 14 23:12:50 zsups228 IEMS: _V2_~I=~H=zsups228~A=IEMS~S=0008~~ CMT300 CRIT TBL CMT
Fault^M      Location: Audit^M      NotificationID: 1002^M      State: Raise^M
Category: Processing Error^M      Cause: Corrupt data^M      Time: Feb 14 23:12:48
2004^M      Component Id: SESM=AuditSystem;Audit=V5.2 Data Integrity Audit^M
  
```



Specific Problem: Data mismatches detected^M  
Data Integrity Audit, has 5 unresolved^M  
problems, open the audit problem repo^M  
the SESM Maintenance menu item.^M

Description: The SESM audit: V5.2  
problems. To view and correct the  
rt from the Audit System found under

## Performance

### OM and PM Documentation references for V5.2 Data Audit

- There are no performance measurements for V5.2 Data Audit V5.2 Data Audit

### Northbound OM/PM Formats

This section provides example output of Performance Measurement data in each of the Northbound formats provided

#### XML

The following is an example of Performance data for V5.2 Data Audit in XML format:

***Note:** Northbound performance interface not supported for this component.*

#### CSV

The following is an example of Performance data for V5.2 Data Audit in CSV format:

***Note:** Northbound performance interface not supported for this component.*

## GUI/CLUI Documentation for V5.2 Data Audit

### GUI Launching and User procedures

- NN10320-100 - ATM Solutions Basics
- NN10300-100 - IP Solutions Basics

### Related documents

- NN10083-911 - CS2000 Fault Management
- NN10281-600 - ATM/IP Administration and Security
- NN10276-500 - ATM/IP Configuration Management
- NIS V208-1 - DMS-100 International Switching V5: CS2K Interface Specification to Support V5.2 Protocol



# References

## Fault Specifications

- [1] Syslog Protocol (RFC 3164): <http://www.ietf.org/rfc/rfc3164.txt>
- [2] Alarm MIB (draft): <http://www.ietf.org/html.charters/disman-charter.html>
- [3] Notification Log MIB (RFC 3014):  
<http://www.ietf.org/rfc/rfc3014.txt?number=3014>

## OAM&P Security

- [4] NN10281-600 - ATM/IP Administration and Security

## Network Engineering

- [5] <SN08 SEB number> - IAC Engineering Guidelines
- [6] <SN08 SEB number> - IAW Engineering Guidelines
- [7] <SN08 SEB number> - UAIP Engineering Guidelines
- [8] <SN08 SEB number> - PT-IP Engineering Guidelines
- [9] <SN08 SEB number> - VoATM Engineering Guidelines
- [10] <SN08 SEB number> - TRIMODAL Engineering Guidelines

## Industry Standards

### PAM

- [11] Introduction to PAM: <http://docs.sun.com/db/doc/805-7229/6j6q8svdi?q=pam.conf&a=view>
- [12] PAM RFC from OpenGroup: <http://www.opengroup.org/tech/rfc/mirror-rfc/rfc86.0.txt>
- [13] pam.conf (Solaris 8): <http://docs.sun.com/db/doc/806-0633/6j9vn6q5t?q=pam.conf&a=view>

## NSSwitch

- [14] Solaris Name Services: <http://docs.sun.com/db/doc/806-1387/6jam6926b?q=nsswitch&a=view>
- [15] nsswitch.conf (Solaris 8): <http://docs.sun.com/db/doc/806-0633/6j9vn6q5m?q=nsswitch&a=view>

## Secure Shell (SSH )

- [16] Secure Shell (secsh) Internet Drafts: <http://www.ietf.org/html.charters/secsh-charter.html>
- [17] OpenSSH: <http://www.openssh.org>

## SNMP V3/USM

- [18] An Architecture for Describing SNMP Management Frameworks (RFC3411): <http://www.ietf.org/rfc/rfc3411.txt?number=3411>
- [19] User-based Security Model (RFC3414): <http://www.ietf.org/rfc/rfc3414.txt?number=3414>
- [20] View-based Access Control Model (RFC3415): <http://www.ietf.org/rfc/rfc3415.txt?number=3415>

## HTTPS

- [21] The SSL Protocol V3.0: <http://wp.netscape.com/eng/ssl3/ssl-toc.html>
- [22] Transport Layer Security (TLS) Extensions (RFC2246): <http://www.ietf.org/rfc/rfc3546.txt>
- [23] HTTP over TLS (RFC 2818): <http://www.ietf.org/rfc/rfc2818.txt>
- [24] OpenSSL: <http://www.openssl.org>

# IEMS Appendix 1: Northbound OSS Configurations

Depending on customer requirements, a single-source OSS interface can be provided from the IEMS server. As an alternate configuration, to support customer transition, some NE specific OSS interfaces can be provided via SDM in parallel with the interfaces provided by IEMS.

For some existing Nortel Networks ATM customers with no new equipment (such as VTOA-AAL1 solutions with only MG4K, PP15K-MSS and XA-Core), the SDM can provide the complete set external interface to third party OSSs. This configuration is only supported for solutions frozen in the SN06 hardware configuration.

In normal configuration, the IEMS is configured to forward all of its collected faults to the OSS through its aggregated interface. The aggregated interface can supply the feed in NTSTD, SCC2, Syslog or SNMP (v2 or v3) format.

The alternate SDM feed can optionally, in addition to the IEMS feed, provide fault streams equivalent to the SN06 streams for the following devices. Use of the optional SDM feed is not required:

- GWC - via GWC Mgr (SESM) on SSPFS via custlog to SDM
- SAM21 - via SAM21 Mgr on SSFPS via custlog to SDM
- UAS - via UAS Mgr (SESM) on SSPFS via custlog to SDM
- PVG (MG7K, MG15K) - via MDM to passport log streamer to SDM
- Passport 15K MSS - via MDM to passport log streamer to SDM

**Note:** All of the streams above also go into IEMS for proper IEMS GUI and security operation. OSSs will still connect to IEMS for any of the other equipment in the portfolio. IEMS can block OSS delivery of the alternate feeds northbound if the same OSS is also connected to the SDM to prevent duplication.

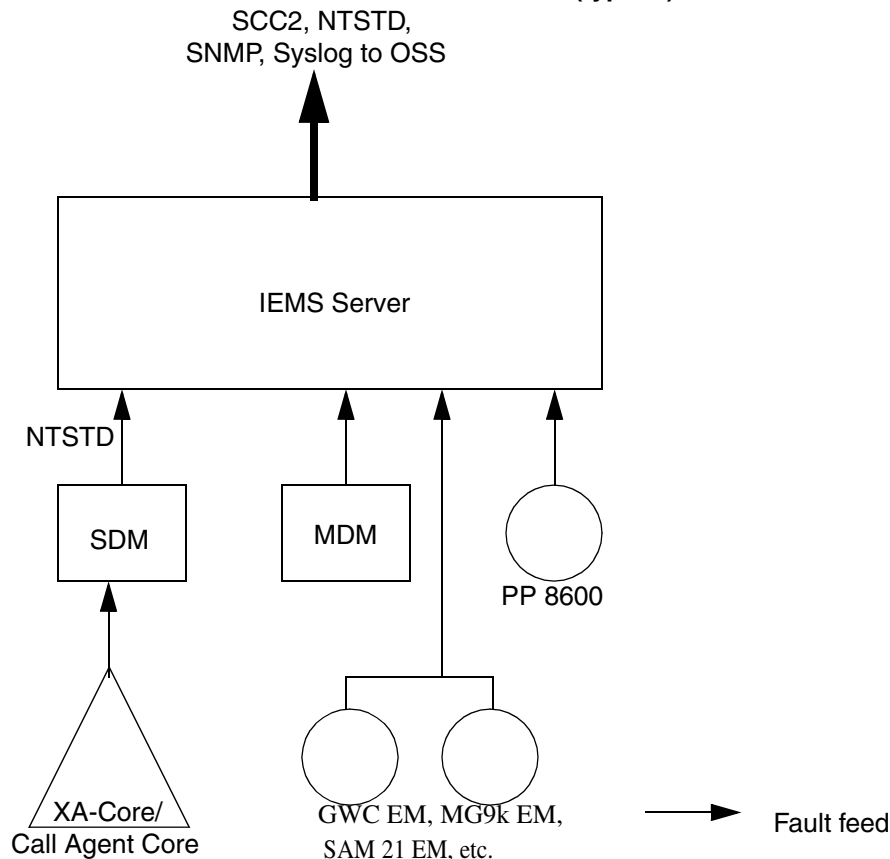
These are in addition to fault streams which can originate from SDM and are supported in all configurations, including TDM only and VTOA-AAL1 solutions:

- CM (XA-Core or Compact) - via SDM
- SDM platform and applications - via SDM

All other fault streams are only supported via IEMS as of SN07. (including but not limited to STORM, CICM, SSPFS Platforms, MS20x0, NGSS

(SSTrunks), SSLines, RTP MP (BCP 7100), MAS, PP8600, MCS System Manager).

**Fault flow with IEMS as Northbound interface (typical)**



**Note:** The SDM SCC2 and NTSTD logroute streams must be configured for SCC2\_old or NTstd\_old. This is a change from SN06.2

This figure shows the fault flows in an office where the IEMS will be the northbound interface. In this configuration, all the devices that have been implemented in IEMS forward their fault information to IEMS. The SDM will only be responsible for forwarding core faults to the IEMS.

**Note:** The SDM logroute stream must be configured from tcpin.

# IEMS Appendix 2: Nortel Alarm Extension MIB

-- Draft Version

NORTEL-ALARM-EXT-MIB

DEFINITIONS ::= BEGIN

IMPORTS

nortelGenericMIBs FROM NORTEL-GENERIC-MIB

alarmActiveEntry, alarmActiveResourceId, alarmActiveDescription,  
ResourceId, alarmActiveDateAndTime

FROM ALARM-MIB

IANAItuEventType, IANAItuProbableCause

FROM IANA-ITU-ALARM-TC

AdminState, OperState, UsageState,

AlarmStatus, StandbyStatus FROM ENTITY-STATE-MIB

nlnLogName, nlnLogIndex FROM NOTIFICATION-LOG-MIB

NOTIFICATION-GROUP FROM SNMPv2-CONF

DateAndTime, DisplayString FROM SNMPv2-TC

SnmpAdminString FROM SNMP-FRAMEWORK-MIB

MODULE-IDENTITY, OBJECT-IDENTITY,

OBJECT-TYPE, NOTIFICATION-TYPE,

Unsigned32

FROM SNMPv2-SMI;

nnExtAlarmMIB MODULE-IDENTITY

LAST-UPDATED "200401270000Z"

ORGANIZATION "Nortel Networks"

CONTACT-INFO

" Nortel Networks  
8200 Dixie Road  
Brampton, Ontario L6T 5P6  
Canada

1-800-4Nortel

```
www.nortelnetworks.com "

DESCRIPTION
    "This module contains objects that extend the IETF Alarm MIB, including
    notifications."

-- Revision history

REVISION "200401270000Z"
DESCRIPTION
    " Initial version"

::= { nortelGenericMIBs 6 }

nnExtAlarmObjects OBJECT IDENTIFIER ::= { nnExtAlarmMIB 1 }
nnExtAlarmConformance OBJECT IDENTIFIER ::= { nnExtAlarmMIB 2 }
nnExtAlarmCompliances OBJECT IDENTIFIER ::= { nnExtAlarmConformance 1 }
nnExtAlarmGroups OBJECT IDENTIFIER ::= { nnExtAlarmConformance 2 }

-- Textual Conventions

NnAvailabilityStatus ::= TEXTUAL-CONVENTION
    STATUS          current
    DESCRIPTION
        "Represents the availability status"
    SYNTAX INTEGER {
        notSupported (1),
        inTest (2),
        failed (3),
        powerOff (4),
        offLine (5),
        offDuty (6),
        dependency (7),
        degraded (8),
        notInstalled (9),
        logFull (10)
    }

NnControlStatus ::= TEXTUAL-CONVENTION
```



```
STATUS          current
DESCRIPTION
    "Represents the control status"
SYNTAX INTEGER {
    notSupported (1),
    subjectToTest (2),
    partOfServiceLocked (3),
    reservedForTest (4),
    suspended (5)
}

NnProceduralStatus ::= TEXTUAL-CONVENTION
    STATUS          current
    DESCRIPTION
        "Represents the procedural status"
    SYNTAX INTEGER {
        notSupported (1),
        initializationRequired (2),
        notInitialized (3),
        initializing (4),
        reporting (5),
        terminating (6)
    }

NnUnknownStatus ::= TEXTUAL-CONVENTION
    STATUS          current
    DESCRIPTION
        "The unknown status attribute is used to indicate that
        the state of the resource represented by the managed object
        is unknown. When the unknown status attribute value is
        true, the value of the state attributes may not reflect
        the actual state of the resource."
    SYNTAX          INTEGER {
        false(1),
        true(2)
    }
```

-- Nortel Extended Active Alarm Table

nnExtAlarmActiveTable OBJECT-TYPE

SYNTAX SEQUENCE OF NnExtAlarmActiveEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"This table contains additional information about active alarms than what is found in the IETF Alarm MIB."

::= { nnExtAlarmObjects 1 }

nnExtAlarmActiveEntry OBJECT-TYPE

SYNTAX NnExtAlarmActiveEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An active alarm entry"

AUGMENTS { alarmActiveEntry }

::= { nnExtAlarmActiveTable 1 }

NnExtAlarmActiveEntry ::= SEQUENCE {

nnExtAlarmActiveEventType IANAItuEventType,

nnExtAlarmActiveProbableCause IANAItuProbableCause,

nnExtAlarmActiveAdditionalText SnmpAdminString,

nnExtAlarmActiveDocumentationPointer SnmpAdminString,

nnExtAlarmActiveResourceDescription SnmpAdminString,

nnExtAlarmActiveManualClear INTEGER,

nnExtAlarmActiveSequenceNumber Integer32

}

nnExtAlarmActiveEventType OBJECT-TYPE

SYNTAX IANAItuEventType

MAX-ACCESS read-write

STATUS current

DESCRIPTION

"Represents the per active alarm instance event type values."

REFERENCE

"ITU Recommendation M.3100, 'Generic Network Information

```
Model', 1995
ITU Recommendation X.733, 'Information Technology - Open
Systems Interconnection - System Management: Alarm
Reporting Function', 1992
ITU Recommendation X.736, 'Information Technology - Open
Systems Interconnection - System Management: Security
Alarm Reporting Function', 1992"
 ::= { nnExtAlarmActiveEntry 1 }

nnExtAlarmActiveProbableCause OBJECT-TYPE
    SYNTAX      IANAItuProbableCause
    MAX-ACCESS  read-write
    STATUS      current

    DESCRIPTION
        "Per active alarm instance ITU probable cause values."

    REFERENCE
        "ITU Recommendation M.3100, 'Generic Network Information
        Model', 1995
        ITU Recommendation X.733, 'Information Technology - Open
        Systems Interconnection - System Management: Alarm
        Reporting Function', 1992
        ITU Recommendation X.736, 'Information Technology - Open
        Systems Interconnection - System Management: Security
        Alarm Reporting Function', 1992"
    ::= { nnExtAlarmActiveEntry 2 }

nnExtAlarmActiveAdditionalText OBJECT-TYPE
    SYNTAX  SnmpAdminString
    MAX-ACCESS read-write
    STATUS  current

    DESCRIPTION
        "Represents the per active alarm instance additional text
        field."

    REFERENCE
        "ITU Recommendation M.3100, 'Generic Network Information
        Model', 1995
```

ITU Recommendation X.733, 'Information Technology - Open  
Systems Interconnection - System Management: Alarm  
Reporting Function', 1992"

```
::= { nnExtAlarmActiveEntry 3 }
```

nnExtAlarmActiveDocumentationPointer OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object services as a pointer to documentation related to this problem.

If there is no specific document pointer for this alarm, this object is a null length string."

```
::= { nnExtAlarmActiveEntry 4 }
```

nnExtAlarmActiveResourceDescription OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This is a textual description of the resource under under alarm.

The format of the string is as follows:

NEtype=NEname;componentType=componentInstanceId;subcompType=subcompInstanceId;....

With NE as the root, the entire containment with the list of Relative Distinguished Names (RDNs) is presented up to the

point where the alarming component is clearly identified.

Semicolon is the delimiter between a 'category=value' pair.

The string can only contain alphanumeric characters and underscores. No commas, spaces, slashes, hyphens, or dollar signs are allowed

"

```
::= { nnExtAlarmActiveEntry 5 }
```

nnExtAlarmActiveManualClear OBJECT-TYPE

```
SYNTAX      INTEGER {  
    other (1),  
    forbidden (2),  
    required (3),  
    optional (4)  
}
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object provides guidance to a mid-level manager on the handling of this alarm. A value of forbidden indicates that a mid-level manager MUST NOT allow this alarm to be manually cleared. A value of required indicates that this alarm has no corresponding clear so MUST always be manually cleared. A value of optional indicates that this alarm does have a corresponding clear, but that is MAY also be cleared manually. A value of other indicates that the manual clear status is either unknown or not one of the specified values."

::= { nnExtAlarmActiveEntry 6 }

nnExtAlarmActiveSequenceNumber OBJECT-TYPE

```
SYNTAX      Integer32
```

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The sequence number of this notification. This object MUST have a value of 0 for notifications without sequence numbers or solutions that don't support sequence numbers."

DEFVAL { 0 }

::= { nnExtAlarmActiveEntry 7 }

-- Nortel Extended Alarm State Information

nnExtAlarmStateTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF NnExtAlarmStateEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table contains state information about active alarms than
    what is found in the IETF Alarm MIB."
 ::= { nnExtAlarmObjects 2 }
```

nnExtAlarmStateEntry OBJECT-TYPE

```
SYNTAX      NnExtAlarmStateEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "An active alarm state entry"
AUGMENTS { alarmActiveEntry }
 ::= { nnExtAlarmStateTable 1 }
```

NnExtAlarmStateEntry ::= SEQUENCE {

```
    nnExtAlarmStateAdministrative    AdminState,
    nnExtAlarmStateOperational       OperState,
    nnExtAlarmStateUsage              UsageState,
    nnExtAlarmStateAlarm              AlarmStatus,
    nnExtAlarmStateAvailability       NnAvailabilityStatus,
    nnExtAlarmStateControl            NnControlStatus,
    nnExtAlarmStateProcedural         NnProceduralStatus,
    nnExtAlarmStateStandby            StandbyStatus,
    nnExtAlarmStateUnknown            NnUnknownStatus
}
```

nnExtAlarmStateAdministrative OBJECT-TYPE

```
SYNTAX      AdminState
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " "
 ::= { nnExtAlarmStateEntry 1 }
```

nnExtAlarmStateOperational OBJECT-TYPE

```
SYNTAX      OperState
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " "
 ::= { nnExtAlarmStateEntry 2 }
```

nnExtAlarmStateUsage OBJECT-TYPE

```
SYNTAX      UsageState
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " "
 ::= { nnExtAlarmStateEntry 3 }
```

nnExtAlarmStateAlarm OBJECT-TYPE

```
SYNTAX      AlarmStatus
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " "
 ::= { nnExtAlarmStateEntry 4 }
```

nnExtAlarmStateAvailability OBJECT-TYPE

```
SYNTAX      NnAvailabilityStatus
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " "
 ::= { nnExtAlarmStateEntry 5 }
```

nnExtAlarmStateControl OBJECT-TYPE

```
SYNTAX      NnControlStatus
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    " "
 ::= { nnExtAlarmStateEntry 6 }
```

nnExtAlarmStateProcedural OBJECT-TYPE

SYNTAX NnProceduralStatus

MAX-ACCESS read-only

STATUS current

DESCRIPTION

" "

::= { nnExtAlarmStateEntry 7 }

nnExtAlarmStateStandby OBJECT-TYPE

SYNTAX StandbyStatus

MAX-ACCESS read-only

STATUS current

DESCRIPTION

" "

::= { nnExtAlarmStateEntry 8 }

nnExtAlarmStateUnknown OBJECT-TYPE

SYNTAX NnUnknownStatus

MAX-ACCESS read-only

STATUS current

DESCRIPTION

" "

::= { nnExtAlarmStateEntry 9 }

-- Table of Information related to Messages

nnExtAlarmMessageTable OBJECT-TYPE

SYNTAX SEQUENCE OF NnExtAlarmMessageEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A table of information on messages. Entries are added to this table when their corresponding notifications have been sent. Entries will be removed from this table as outlined in the Notification Log MIB [RFC3014]. Implementations that do not support the Notification Log MIB should



```

        provide behavior for nlmLogName, nlmLogIndex and
        this table as if they did."
 ::= { nnExtAlarmObjects 3 }

```

#### nnExtAlarmMessageEntry OBJECT-TYPE

```

SYNTAX      NnExtAlarmMessageEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "An alarm message entry."
INDEX       { nlmLogName, nlmLogIndex }
 ::= { nnExtAlarmMessageTable 1 }

```

```

NnExtAlarmMessageEntry ::= SEQUENCE {
    nnExtAlarmMessageResource      ResourceId,
    nnExtAlarmMessageResourceDescription SnmpAdminString,
    nnExtAlarmMessageDateAndTime   DateAndTime,
    nnExtAlarmMessageDocumentationPointer SnmpAdminString,
    nnExtAlarmMessageInfo          SnmpAdminString
}

```

#### nnExtAlarmMessageResource OBJECT-TYPE

```

SYNTAX      ResourceId
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object identifies the resource that this message pertains to

    If there is no corresponding resource, then
    the value of this object MUST be 0.0."
 ::= { nnExtAlarmMessageEntry 1 }

```

#### nnExtAlarmMessageResourceDescription OBJECT-TYPE

```

SYNTAX      SnmpAdminString
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This is a textual description of the resource this message

```

pertains to.

The format of the string is as follows:

NEtype=NName;componentType=componentInstanceId;subcompType=subcompInstanceId;....

With NE as the root, the entire containment with the list of Relative Distinguished Names (RDNs) is presented up to the

point where the messaging component is clearly identified.

Semicolon is the delimiter between a 'category=value' pair.

The string can only contain alphanumeric characters and underscores. No commas, spaces, slashes, hyphens, or dollar signs are allowed

"

::= { nnExtAlarmMessageEntry 2 }

nnExtAlarmMessageDateAndTime OBJECT-TYPE

SYNTAX DateAndTime

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The local date and time when the message originated.

Implementations MUST include the offset from UTC, if available. Implementation in environments in which the UTC offset is not available is NOT RECOMMENDED."

::= { nnExtAlarmMessageEntry 3 }

nnExtAlarmMessageDocumentationPointer OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object services as a pointer to documentation related to this problem.

If there is no specific document pointer for this alarm, this object

```

        is a null length string."
 ::= { nnExtAlarmMessageEntry 4 }

nnExtAlarmMessageInfo OBJECT-TYPE
    SYNTAX      SnmpAdminString
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A textual description of the event that has occurred,
        suitable to display to an operator. "
 ::= { nnExtAlarmMessageEntry 5 }

-- all notification OIDs would be prefixed with a zero OID to
-- facilitate snmp v1<->v2 conversion

nnExtNotificationPrefix OBJECT-IDENTITY
    STATUS      current
    DESCRIPTION
        "This OID represents the prefix branch for all Nortel ITU
        Alarm Notifications.
        The last but one sub identifier in the OID of
        any Notification must have the value zero to facilitate
        v2<-->v1 conversion."
 ::= {nnExtAlarmObjects 0 }

-- Alarm Notifications

nnExtAlarmClear NOTIFICATION-TYPE
    OBJECTS { alarmActiveResourceId,
              alarmActiveDateAndTime,
              alarmActiveDescription,
              nnExtAlarmActiveEventType,
              nnExtAlarmActiveProbableCause,
              nnExtAlarmActiveAdditionalText,
              nnExtAlarmActiveDocumentationPointer,
              nnExtAlarmActiveResourceDescription,
              nnExtAlarmActiveSequenceNumber
    }

```

```
    }

    STATUS    current
    DESCRIPTION
        "This notification indicates that one or more previously
        reported alarms have been cleared and the previously reported
        alarms are identified via the correlation id list field.
        The varbinds include alarm context via the ComponentId field
        and other additional useful information."

 ::= { nnExtNotificationPrefix 301 }

nnExtAlarmWarning NOTIFICATION-TYPE
    OBJECTS { alarmActiveResourceId,
               alarmActiveDateAndTime,
               alarmActiveDescription,
               nnExtAlarmActiveEventType,
               nnExtAlarmActiveProbableCause,
               nnExtAlarmActiveAdditionalText,
               nnExtAlarmActiveDocumentationPointer,
               nnExtAlarmActiveResourceDescription,
               nnExtAlarmActiveManualClear,
               nnExtAlarmActiveSequenceNumber
            }

    STATUS    current
    DESCRIPTION
        "This notification indicates that an alarm of 'Warning' severity
        has been raised on a NE.
        The varbinds include alarm context via the ComponentId field
        and other additional useful information on the alarm condition."

 ::= { nnExtNotificationPrefix 302 }

nnExtAlarmMinor NOTIFICATION-TYPE
    OBJECTS { alarmActiveResourceId,
```

```
        alarmActiveDateAndTime,
        alarmActiveDescription,
        nnExtAlarmActiveEventType,
        nnExtAlarmActiveProbableCause,
        nnExtAlarmActiveAdditionalText,
        nnExtAlarmActiveDocumentationPointer,
        nnExtAlarmActiveResourceDescription,
        nnExtAlarmActiveManualClear,
        nnExtAlarmActiveSequenceNumber
    }

STATUS    current
DESCRIPTION
    "This notification indicates that an alarm of 'Minor' severity
    has been raised on a NE.
    The varbinds include alarm context via the ComponentId field
    and other additional useful information on the alarm condition."

::= { nnExtNotificationPrefix 303 }


nnExtAlarmMajor NOTIFICATION-TYPE
    OBJECTS { alarmActiveResourceId,
        alarmActiveDateAndTime,
        alarmActiveDescription,
        nnExtAlarmActiveEventType,
        nnExtAlarmActiveProbableCause,
        nnExtAlarmActiveAdditionalText,
        nnExtAlarmActiveDocumentationPointer,
        nnExtAlarmActiveResourceDescription,
        nnExtAlarmActiveManualClear,
        nnExtAlarmActiveSequenceNumber
    }

STATUS    current
DESCRIPTION
    "This notification indicates that an alarm of 'Major' severity
    has been raised on a NE."
```

The varbinds include alarm context via the ComponentId field and other additional useful information on the alarm condition."

```
::= { nnExtNotificationPrefix 304 }
```

```
nnExtAlarmCritical NOTIFICATION-TYPE
```

```
    OBJECTS { alarmActiveResourceId,  
               alarmActiveDateAndTime,  
               alarmActiveDescription,  
               nnExtAlarmActiveEventType,  
               nnExtAlarmActiveProbableCause,  
               nnExtAlarmActiveAdditionalText,  
               nnExtAlarmActiveDocumentationPointer,  
               nnExtAlarmActiveResourceDescription,  
               nnExtAlarmActiveManualClear,  
               nnExtAlarmActiveSequenceNumber  
    }
```

```
STATUS    current
```

```
DESCRIPTION
```

"This notification indicates that an alarm of 'Critical' severity has been raised on a NE.

The varbinds include alarm context via the ComponentId field and other additional useful information on the alarm condition."

```
::= { nnExtNotificationPrefix 305 }
```

```
nnExtAlarmMessage NOTIFICATION-TYPE
```

```
    OBJECTS {  
        nnExtAlarmMessageResource,  
        nnExtAlarmMessageResourceDescription,  
        nnExtAlarmMessageDateAndTime,  
        nnExtAlarmMessageDocumentationPointer,  
        nnExtAlarmMessageInfo  
    }
```

```
STATUS    current
```

```
DESCRIPTION
    "An informational message. This notification does not
    correspond to an alarm so would not be stored in the
    active alarm table and it does not have a corresponding
    clear."
::= { nnExtNotificationPrefix 306 }

-- Notification group definitions

nnExtAlarmNotificationsGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        nnExtAlarmClear,
        nnExtAlarmWarning,
        nnExtAlarmMinor,
        nnExtAlarmMajor,
        nnExtAlarmCritical
    }
    STATUS    current
    DESCRIPTION
        " Nortel alarm notification group."
    ::= { nnExtAlarmGroups 1}

nnExtAlarmGroup OBJECT-GROUP
    OBJECTS {
        nnExtAlarmActiveEventType,
        nnExtAlarmActiveProbableCause,
        nnExtAlarmActiveAdditionalText,
        nnExtAlarmActiveDocumentationPointer,
        nnExtAlarmActiveResourceDescription,
        nnExtAlarmActiveManualClear,
        nnExtAlarmActiveSequenceNumber
    }
    STATUS    current
    DESCRIPTION
        " Nortel alarm group."
    ::= { nnExtAlarmGroups 2}
```

```
nnExtAlarmStateGroup OBJECT-GROUP
    OBJECTS {
        nnExtAlarmStateAdministrative,
        nnExtAlarmStateOperational,
        nnExtAlarmStateUsage,
        nnExtAlarmStateAlarm,
        nnExtAlarmStateAvailability,
        nnExtAlarmStateControl,
        nnExtAlarmStateProcedural,
        nnExtAlarmStateStandby,
        nnExtAlarmStateUnknown
    }
    STATUS current
    DESCRIPTION
        " Nortel alarm state group."
    ::= { nnExtAlarmGroups 3}

nnExtAlarmMessageGroup OBJECT-GROUP
    OBJECTS {
        nnExtAlarmMessageResource,
        nnExtAlarmMessageInfo,
        nnExtAlarmMessageDocumentationPointer,
        nnExtAlarmMessageDateAndTime,
        nnExtAlarmMessage
    }
    STATUS current
    DESCRIPTION
        " Nortel alarm message group."
    ::= { nnExtAlarmGroups 4}

-- Compliance
nnExtAlarmCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for entities which implement
        the Nortel Alarm MIB."
    MODULE -- this module
    MANDATORY-GROUPS {
```



```
        nnExtAlarmGroup
    }
    ::= { nnExtAlarmCompliances 1}
END
```





# SN08 Feature Deltas

***Product = CS 2000***

## **A59039138 -- (Visual) Message Waiting Indicator (V)MWI/CFX (IAC)**

**Note:** This feature was developed in SN05 and SN06 but was not activated for those releases in the North American market. It is now active and available in the North American market starting in SN07.

### **Description**

#### **Overview**

This activity provides the following functionality for the Integrated Access Cable IP Solution:

- CMWI (Class Message Waiting Indicator) for CEPT and Bellcore lines on Succession.
- Announcement as an optional replacement for the MWT stuttered dial tone indications for MWT suboptions CMWI and STD.

#### **Background Information**

Message Waiting allows a user to have a list of messages stored against their station. When a message is queued for a station, the MWI (Message Waiting Indicator) associated with the line is activated. When the last message is retrieved, the MWI is deactivated.

The MWT option has several sub options (STD, MWL, CMWI, PRN, MWL\_STD). This activity focuses on STD and CMWI suboptions.

- CMWI (Class Message Waiting)<sup>1</sup> is used for sets which are capable of displaying a MWI request in a display or as a flashing lamp. In addition it

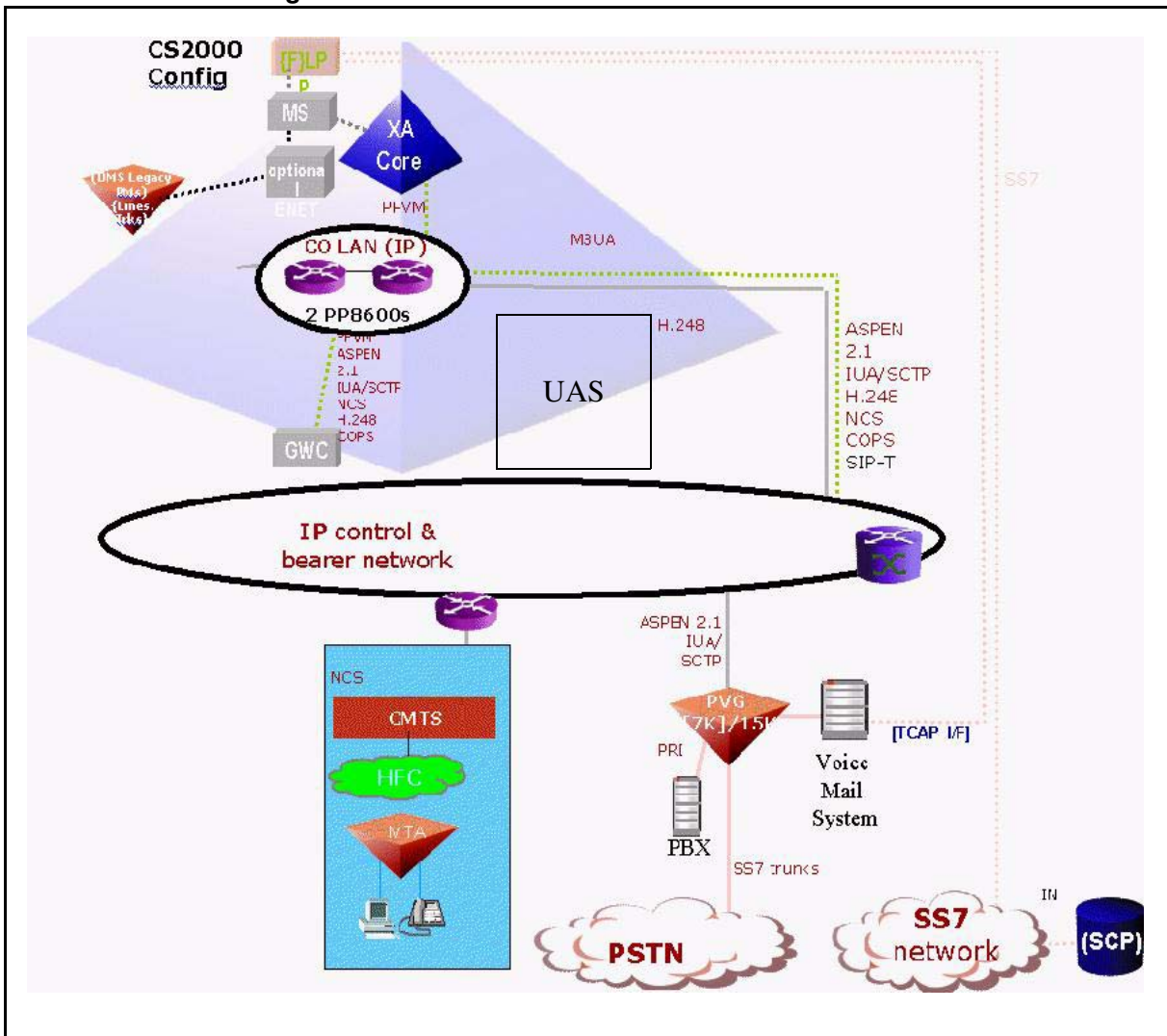
---

1. AG1954 'CLASS: VISUAL MESSAGE WAITING INDICATOR'

provides audible (stuttered dial tone) or ring splash notification. The last can be activated and deactivated by dialing an activation code.

- STD (Stuttered Dial Tone) This is only used for applying a stuttered dial tone if a message is waiting.

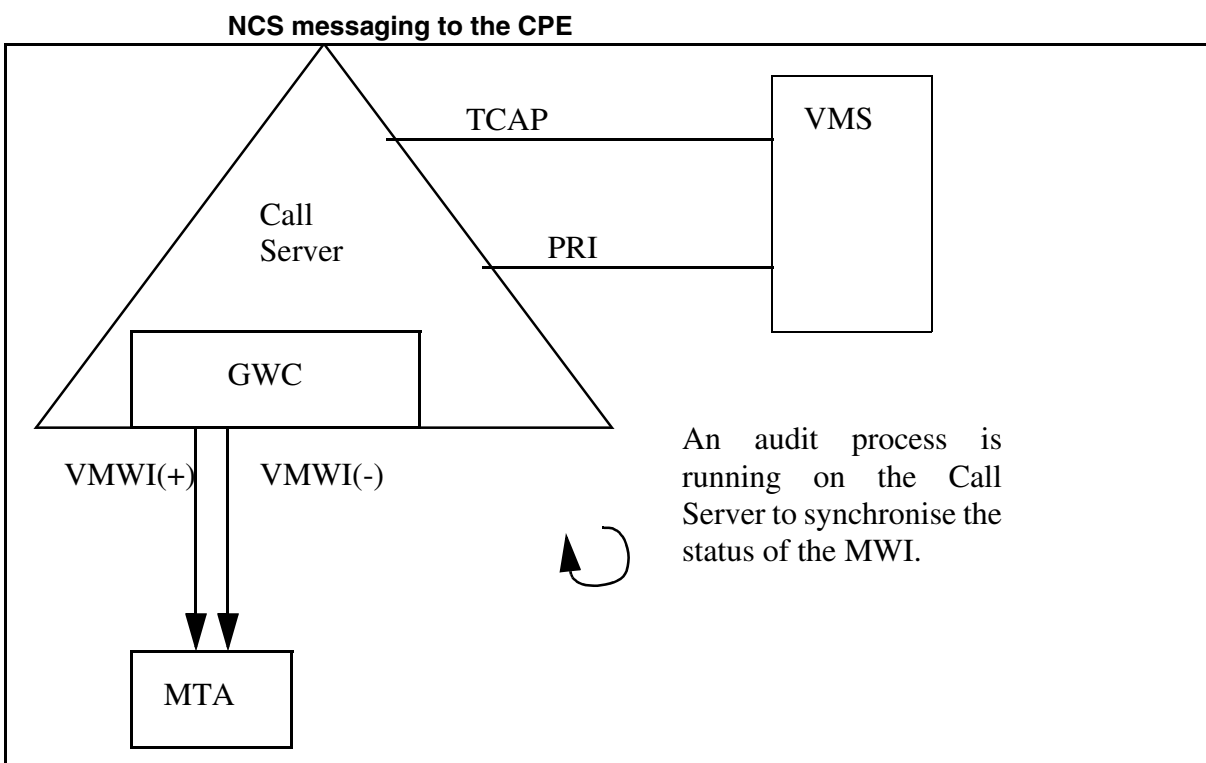
### Configuration VMWI



On MMP the Visual Message Waiting was signalled to the user by a special Line Class Tone. For Integrated Access Cable Media an NCS<sup>2</sup> message is used. For activating the MWI a VMWI(+) message is sent. For deactivation a VMWI(-).

In addition to this the Call Server should periodically refresh the CPE's (Customer Premise Equipment) visual indicator (Audit).

2. PKT-SP-EC-MGCP-I02-991201



### Agent Interworking

The Controlling user is a VMS (Voice Mail System) connected over

- PRI (MG15000 [previously PVG], PDTC)
- TCAP (LPP, USP)

to the Call Server.

The receiving user can be an IBN line connected via

- GWC - hosted on Motorola CG4500E MTA
- PLGC

### Provisioning of the MWT service

The message waiting service can be provisioned with the following options: {STD,MWL,CMWL,PRN,MWL\_STD}.

When the MWTANN announcement option is selected for MWT, datafill is required for the announcement. The CLLI for this announcement must be MWT. The CLLI can not be changed by the telco.

Below is sample datafill from a lab switch for the MWTANN feature:

```

> table clli
TABLE: CLLI
>pos mwt
MWT 433 5 TEST
>quit
CI:
>table anns
TABLE: ANNS
>pos mwt
MWT ALL 1 1 1 STND N 59 60
>quit
CI:
>table annmems
TABLE: ANNMEMS
>pos mwt 1
MWT 1
DRAM DRA
( 0 DTM 7 3)$
>quit
CI:
>table annphlst
TABLE: ANNPHLST
>pos mwt 0
MWT 0
( HAVE_MSG)$
>quit

***Create the announcement using DRAMREC***
> DRAMREC
> connect the HSET to a DRAM with available space.....
>Record have_msg 3 nopad 8 3 12
> QUIT

```

\*\*\*\*This in turn creates a tuple in table dramphrs in a SN06 and beyond load. \*\*\*\*

```

>table dramphrs
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: DRAMPHRS
>pos 8 have_msg
8 HAVE_MSG 12 4 3 Y N 4

```

### Table IBNFEAT

This feature adds the new announcement field MWT\_ANNOUNCEMENT to the MWT feature in table IBNFEAT. A datafill example follows.

```

>add
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
LEN:

```

```
>HOST 01 0 07 00
DNNO:
>0
DF:
>mwT
FEATURE:
>mwT
NOTICE:
>std
MWT_ANNOUNCEMENT: N
>Y
CAR:
>n
CRX: N
>n
TUPLE TO BE ADDED:
HOST 01 0 07 00
          0      MWT      MWT      STD      Y      N      N
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
TUPLE ADDED
JOURNAL FILE INACTIVE
>
```

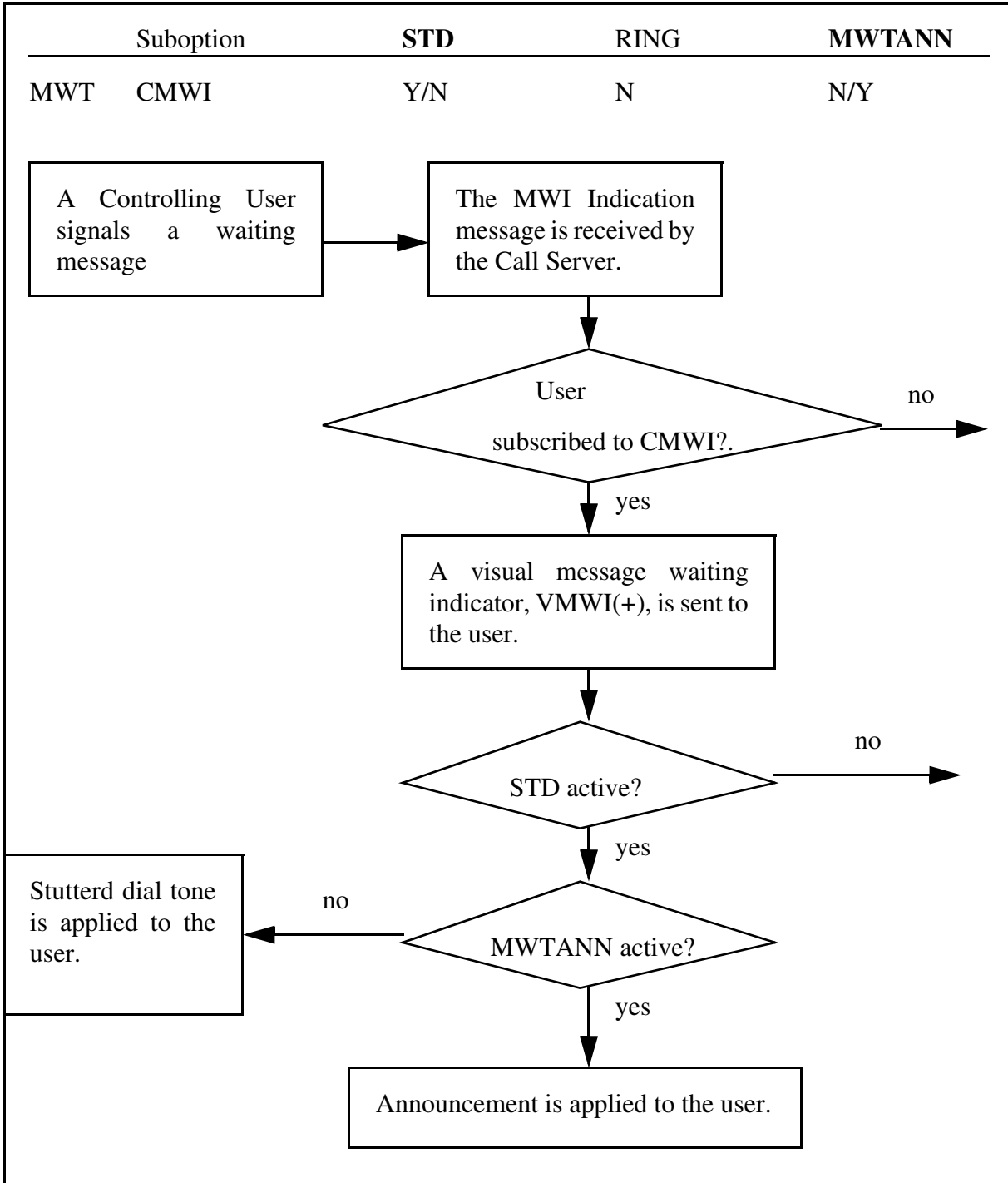
### Overview of the CMWI Service

CLASS Message Waiting Indicator (CMWI) was developed under feature AG1954. The CMWI allows a subscriber to combine the visual message waiting indicator with audible indication types.

- **STD - Stuttered Dial Tone**  
On active message waiting a stuttered dial tone is applied when the user goes off-hook
- **Ring Splash**  
On active message waiting a ring burst is applied to the users' phone
- **MWTANN - Announcement**  
On active message waiting an announcement is applied to the user.

For the Integrated Access Cable IP solution the signaling to the end user was shown in [“NCS messaging to the CPE” on page 673](#).

Figure [“CMWI Overview” on page 676](#) shows a functional overview on how the different indication components work together.

**CMWI Overview**



This feature creates a new SERVORD prompt called MWT\_ANNOUNCEMENT. The provisioning for the CMWI service looks as follows:

**SERVORD example for CMWI**

```
>DN_OR_LEN:
>8838441020

OPTION:
>mwt

NOTICE:
>cmwi

CMWISTD:
>y

MWT_ANNOUNCEMENT:

>y

CMWIRING:
>y

STATUS:
>act

CAR:
>y

CRRCFW:
>all

CRX:
>n

OPTION:
>$

COMMAND AS ENTERED:

ADO NOW 1 12 4 AM 8838441020 (MWT CMWI Y y Y ACT Y ALL N ) $
ENTER Y TO CONFIRM,N TO REJECT OR E TO EDIT
```

The CMWI option must be activated in table RESOFC.

**Table RESOFC**

| KEY  | ENABLED | ACCESS      | FEATDATA |
|------|---------|-------------|----------|
| CMWI | Y       | SUBSCR CMWI | SINGLE 5 |

The datafill above shows an example of the CMWI entry where the feature is enabled, using the Single Data Message format and allows 5 retransmissions per activation/deactivation request.

### STD suboption

The STD option enables a subscriber to hear a stuttered dial tone if a message is waiting for them. This example shows the new SERVORD prompt called MWT\_ANNOUNCEMENT.

#### SERVORD example for STD suboption

```
>DN_OR_LEN:
>8838441020

OPTION:
>mwt

NOTICE:
>STD

MWT_ANNOUNCEMENT:

>Y

OPTION:
>$

COMMAND AS ENTERED:

ADO NOW 1 12 4 AM 8838441020 ( MWT STD Y Y ALL N ) $

ENTER Y TO CONFIRM,N TO REJECT OR E TO EDIT
```

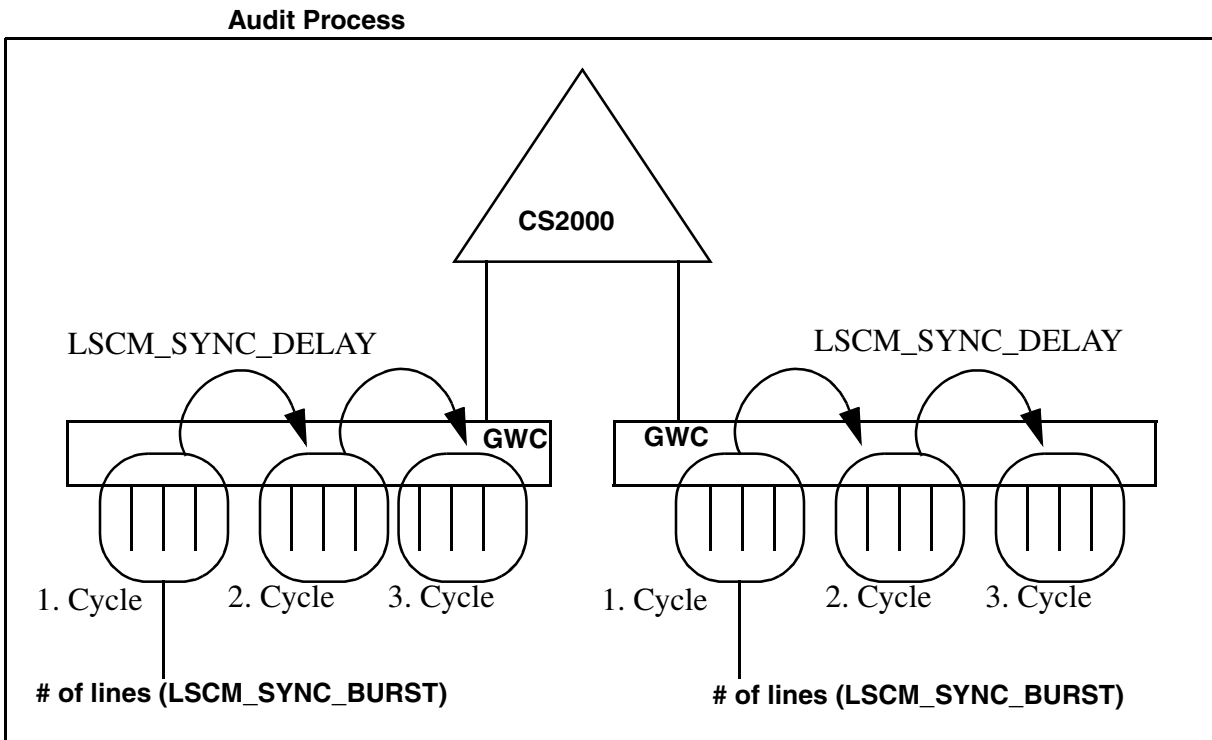
### Datafilling the Audit for CMWI

In table OFCENG two tuples have to be datafilled in order to start the audit.

#### OFCENG - Audit

| Tuple           | Value                                                  |
|-----------------|--------------------------------------------------------|
| LSCM_SYNC_BURST | # of lines audited per peripheral in one cycle (0..10) |
| LSCM_SYNC_DELAY | delay between audit cycles (5 to 6000 s)               |

The next figure shows the how the audit based on the two datafillable parameters works. LSCM\_SYNC\_BURST gives the number of lines on an each peripheral which is audited by one cycle. The LSCM\_SYNC\_DELAY defines the time between the cycles.



Engineering information is provided below.

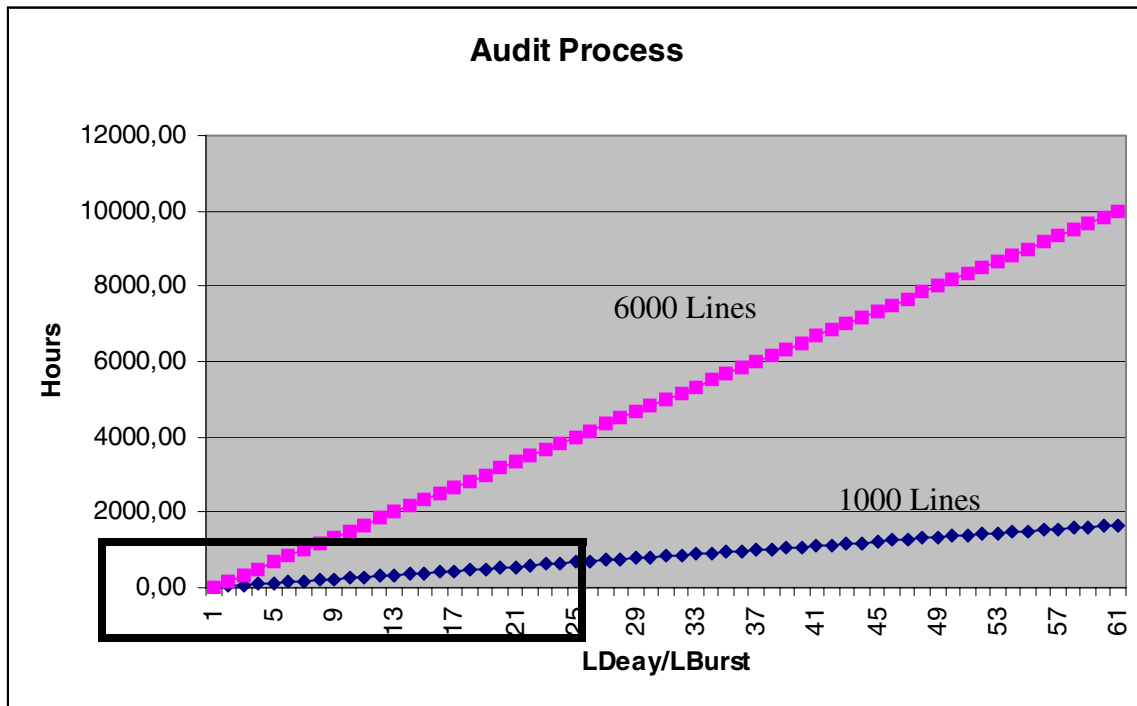
The following variables are defined:

- $L_{Burst}$  (as datafilled)
- $L_{SyncDelay}$  (as datafilled)
- $N_{all}$  (Number of all Lines connected to Peripherals)
- $t_{circle}$  (Time for one complete Circle for all Lines)
- $t_{c1}$  (Time for one circle)

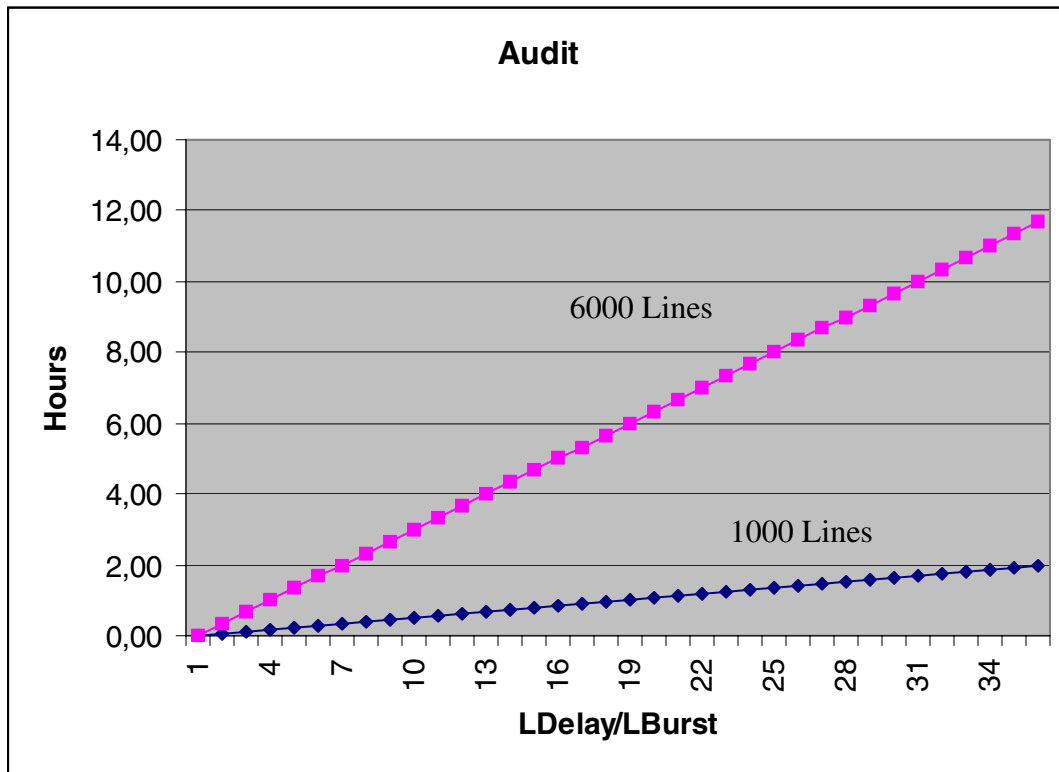
For the first calculation  $t_{c1} \ll 1s$  and is not be considered.

$$\left( \frac{L_{Burst}}{L_{SyncDelay} \cdot N_{all}} \right)^{-1} = t_{circle}$$

Diagram for Audit Process



A detailed view of the marked area is shown in the next figure.

**Diagram for Audit Process--detail**

If  $t_{c1}$  is not considered to be small in comparison with the complete cycle time the equation will change into:

$$\left( \frac{L_{Burst}}{(L_{SyncDelay} + t_{c1}) \cdot N_{all}} \right)^{-1} = t_{circle}$$

$t_{c1}$  is not only dependent on the time of the audit itself. Traffic and System Usage need to be considered.

### **Hardware Requirements or Dependencies**

n/a

### **Software Requirements or Dependencies**

n/a

## Limitations and restrictions

- SMDI as a Controlling User is not included in this activity.
- No CEPT style user activation/deactivation for CMWI Ring Splash supported
- V5.2 Receiving Users are not covered by this activity.
- MWT\_ANNOUNCEMENT will not be visible in KSETFEAT table for ISDN lines,
- Since MWT\_ANNOUNCEMENT is not supported for ISDN lines, this field automatically set to FALSE, during addition of MWT option to ISDN lines.

## Interactions

- CFIND: CFIND has precedence over MWI when Call Forwarding is active
- WML: The warm line timer is started after the announcement for MWT has finished playing.
- CEPT CFU (Call Forwarding Universal): CFU always gives a special dial tone to the user if CFU is active. If CFU and MWI are active and the user has the MWI announcement option, and first the announcement is played and then the user will hear the CEPT CFU tone.
- CEPT CFB/CFD: No interaction

## Applicable customer facing sections

### Fault Management

|        |       |
|--------|-------|
| Logs   | _____ |
| Alarms | _____ |

### Configuration

|                    |       |
|--------------------|-------|
| Data Schema        | _____ |
| User Interface     | _____ |
| Element Management | _____ |
| Security           | _____ |
| Service Order      | __X__ |
| Office Parameters  | _____ |

|                                   |       |
|-----------------------------------|-------|
| Accounting (includes AMA billing) | _____ |
|-----------------------------------|-------|

|                                                 |       |
|-------------------------------------------------|-------|
| Performance (includes operational measurements) | _____ |
|-------------------------------------------------|-------|

## Glossary

| Term  | Description                                                        |
|-------|--------------------------------------------------------------------|
| VMS   | Voice Mail System                                                  |
| CMWI  | Class Message Waiting Indicator                                    |
| MWI   | Message Waiting Indicator                                          |
| PRI   | Primary Rate Interface                                             |
| CEPT  | European Conference of Post and Telecommunications Administrations |
| CFx   | Call Forwarding                                                    |
| CLASS | Custom Local Area Signalling Service                               |

## References

- PKT-SP-EC-MGCP-I02-991201 PacketCable Network-Based Call Signalling Protocol Specification

## *Product = CS 2000*

### **A89007809--GWC-EM Support for the Internet Transparency**

#### **Solution Pre-Midcom**

#### *Functional Description*

#### **1.1 Applicable Solution(s)**

IAW, IAC

*Note:* This is an SN06 feature, included here by special request.

#### **1.2 Description**

The Pre-Midcom solution consists in provisioning Media Proxies and NATs to allow calls to take place across VPNs (Virtual Private Network) for SN06 on the CS2K.

The Media Proxy device will be used to allow a gateway in one domain to communicate with another gateway in another domain. A GWC will select and then setup the Media Proxy per call flow (a pool of Media Proxies will be available to perform the NAT traversal functions). The NAT provides the gateway with a temporary public address.

Through the GUI, one or more physical NATs are provisioned as a single logical NAT per Media Gateway.

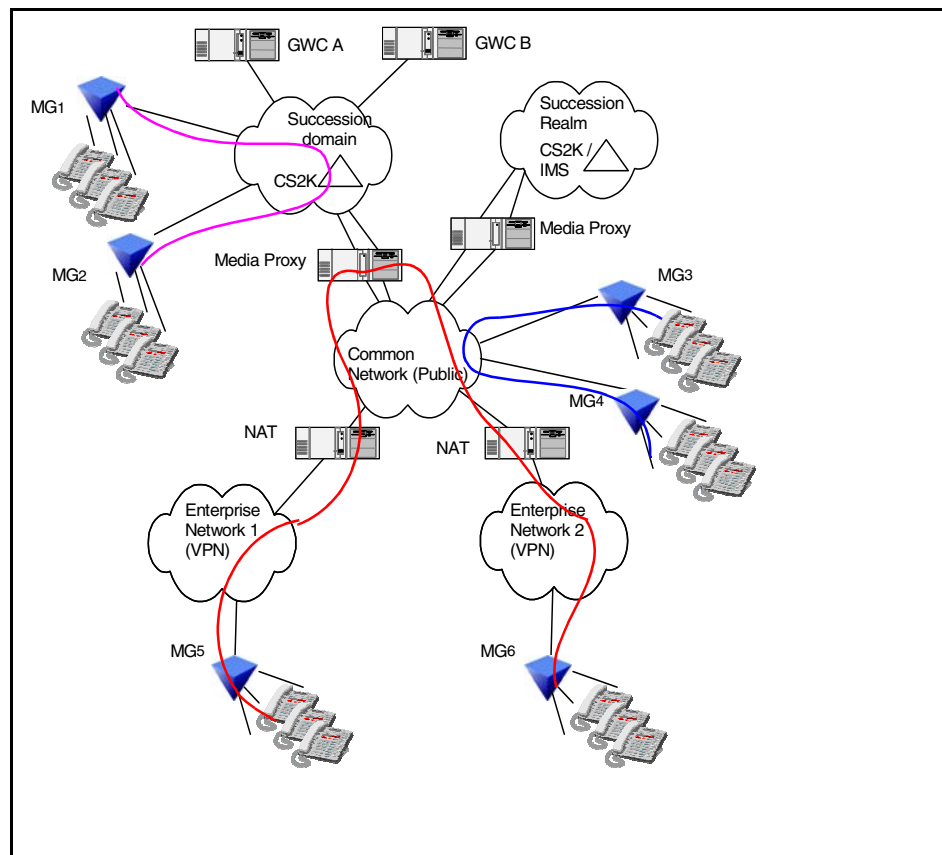
The GUI will also provision the Media Proxies which resolve the addressing of the NATs.

The data for a NAT will be sent down to GWC when this NAT is associated to a MG.

The data for a Media Proxy will be sent down to the GWC when this MP is associated to a GWC.

Figure 1 shows a Network description. References to this Figure will be made through out the document.

**Figure 1 Network description**



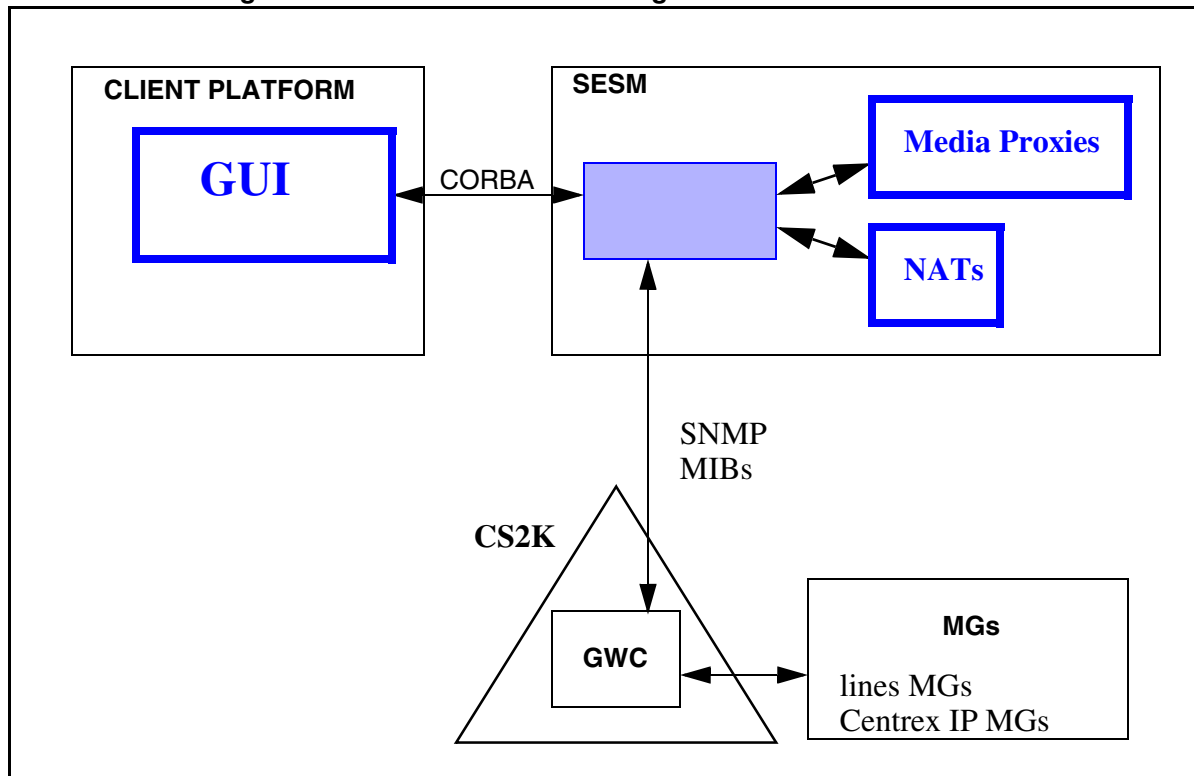
- MG1 and MG2 are in the same domain as the Succession equipment: no NAT traversal is required for signalling (MP can act as a NAT to allow communication to the public domain).



- MG3 and MG4 are in the public area (with public routable addresses) but not in a VPN: no NAT traversal is required to reach the public network (and the call between MG3 and MG4 do not need the MP).
- MG5 and MG6 are in the private area in VPNs and behind NATs (that may need the MP to resolve their addressing).

### 1.3 Hardware Requirements or Dependencies

Figure 2 Functional Behavior Diagram



Note: The component outlined in blue will be describe in this document. It is the component affected by the provisioning activity.

#### Requirements for the whole Pre-midcom solution:

- CS2K.
- SESM Platform (Succession Element and Sub-Element Manager).
- IMS manager to handle provisioning of the Media Proxy.
- Uncontrolled NATs.
- Media Proxies.

- MGs.

## 1.4 Software Requirements or Dependencies

Dependencies:

- GWC should have the Pre-Midcom software
- Strict dependencies:
  - AT.89007657: GWC Pre-MIDCOM Internet Transparency: GWC tables and interfaces. Where the SNMP MIB interfaces are implemented.
  - AT.89008030: Gateway profile Service type.
- Other related features under the ICAF (AT.89007990):
  - AT.89007980: Internet Transparency Application Agent
  - AT.89007985: Control of Media Proxy.
  - AT.89009783: MG Protocol Through NAPTS & Provisioning for MG Name.
  - AT.89007809: GWCEM support for the Internet Transparency solution.
  - AT.89007814: PTM Support for the Internet Transparency solution. Where the OSSGATE interfaces and the modifications to Nodesprov are implemented.

## 1.5 Limitations and restrictions

There is only one NAT exit point from a local network. If two gateways are behind the same NAT then they can setup a call without requiring a Media Proxy.

The DQoS IAC solution (ACTID 59039082/59006771) uses PepServers.

The Internet transparency IAW solution uses Nat Middleboxes.

These two solutions are mutually exclusive as defined in the gateway profile service type.

e.g. DQOS and ITRANS cannot be defined together in a profile.

Thus, when associating Media Gateways to a GWC, the user can associate either Pep Servers (DQOS) or NATs (Pre-Midcom) to the Media Gateway. One choice excludes the other.

## 1.6 Interactions

The provisioning of Media proxies and NATs brought changes to the following GUIs:

- Network Configuration Panel (see 1.7.1.1.1 figure 3, 1.7.1.3.1 figure 6).
- GWC Provisioning Panel (see figure 4, figure 8).

- Associate Media Gateway window (see 1.7.1.3.2).

## 1.7 Applicable customer facing sections

### Fault Management

Logs \_N/A\_

Alarms \_N/A\_

### Configuration

Data Schema \_N/A\_

User Interface \_X\_

Element Management \_X\_

Security \_N/A\_

Service Order \_N/A\_

Office Parameters \_N/A\_

Accounting (includes AMA billing) \_N/A\_

Performance (includes operational measurements) \_N/A\_

### 1.7.1 User Interface - GUI

Media Proxies are provisioned on IMS manager. This application adds the pre-provisioning of the MIBs to the GWC. The network configuration GUI is extended to pre-provision the two new data entries: NAT devices and Media Proxy devices.

- Provisioning Media Proxies:

Support the addition, deletion and modification of the Media Proxy devices.

The following list defines the Media Proxy data structure: Device Name (FQDN), Device IP Address, Device Protocol and Device Protocol Version.

A Media Proxy can be associated with up to 5 GWCs, so to delete a Media Proxy the user must firstly remove all GWC associations (similar to the Pep and NAT functionality).

- Provisioning NATs:

Support the addition, deletion and display of the NAT devices.

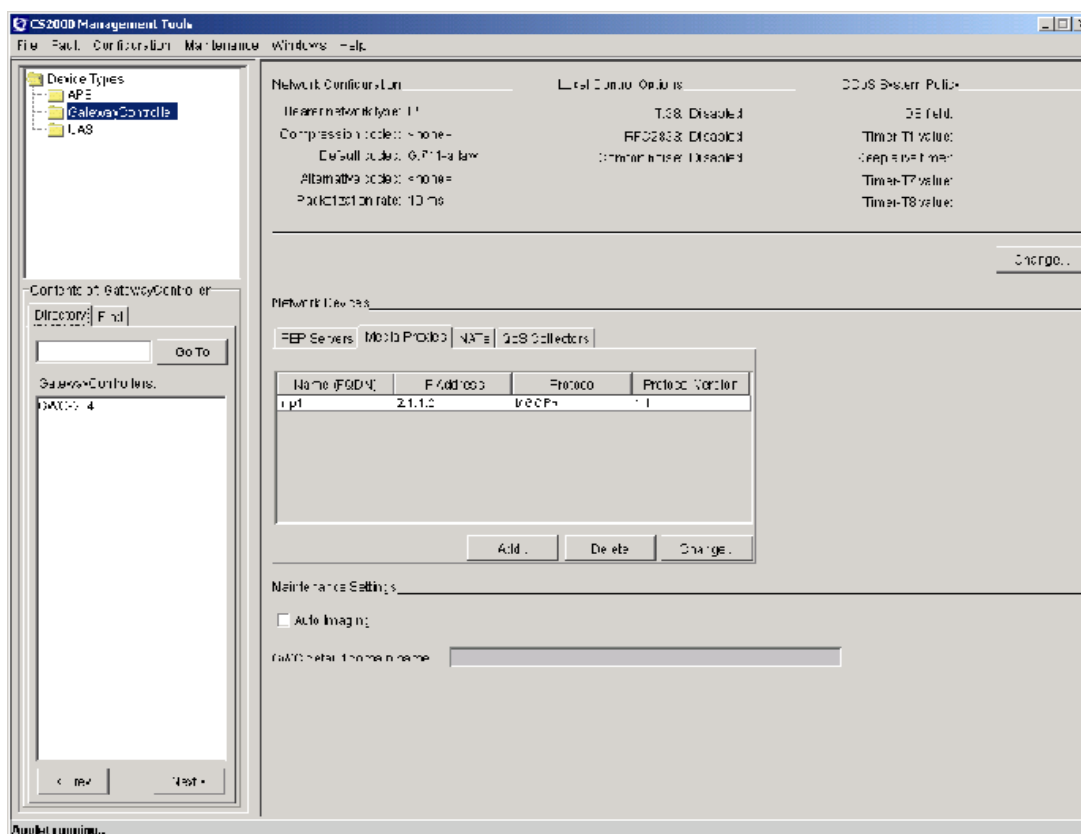
The following list defines the NAT data structure: Device Name and Device NAT Type (None, Non-Controlled). NAT Type will be defaulted to “Non-Controlled NAT”.

### 1.7.1.1 Provisioning Media Proxy

#### 1.7.1.1.1 Media Proxy: Add, Change, Delete

In Network Configuration Panel, a tabbed pane is added for adding/deleting/modifying a Media Proxy.

**Figure 3 New configuration: “Media proxies” tabbed pane**



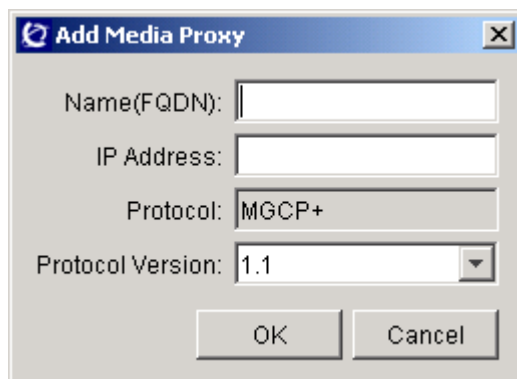
The user will be able to select among the three options: add a Media Proxy, delete a Media Proxy, or change a Media Proxy.

✎ **Add button:** Defines a new Media Proxy and adds it to the Database.

Media Proxy data structure - expectations for the different fields:

- Name: FQDN (unique)
- IP Address; format “<0-255>.<0-255>.<0-255>.<0-255>”
- Protocol: “MGCP”

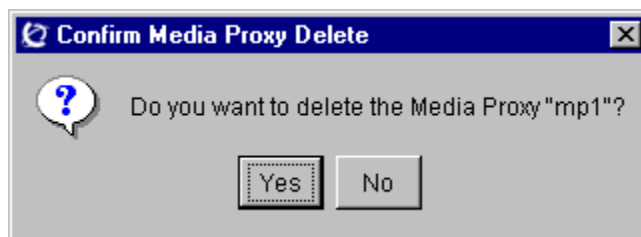
- Protocol Version: “1.1”



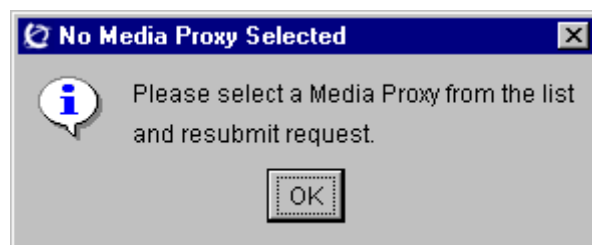
✕ **Delete button:** Deletes a selected Media Proxy.

Select a Media Proxy by highlighting its line, click on '**Delete**' button, a dialog box will ask the user to confirm his/her choice.

**Note:** to delete a Media Proxy the user must firstly remove all GWC associations to this MP.

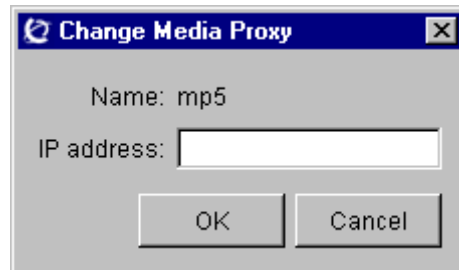


- If the user doesn't select a Media Proxy before clicking on '**Delete**' button, the following box appears:

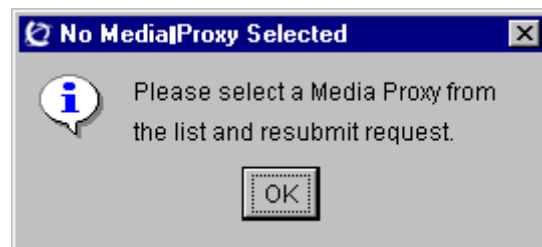


✕ **Change button:** Changes the IPaddress of a selected Media Proxy.

- Select the Media Proxy to be modified by highlighting its line and click on ‘**Change**’ button. Then enter the new IP address as below.

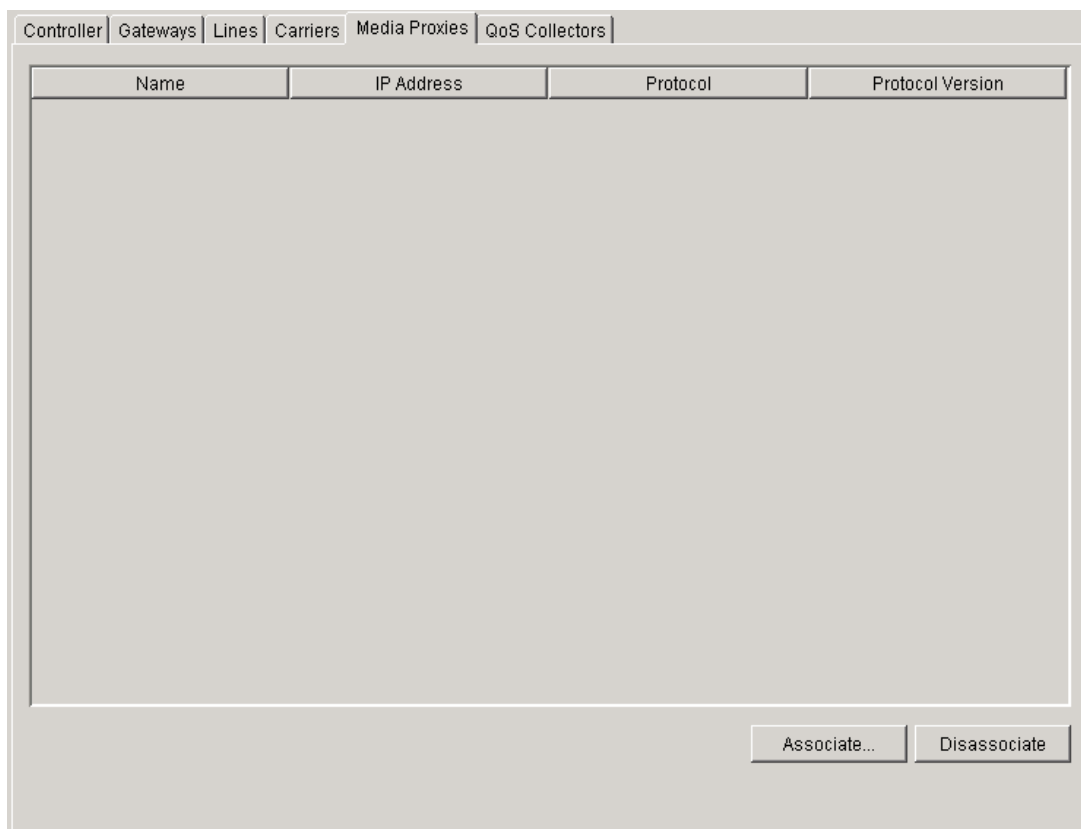


- If the user doesn't select a Media Proxy before clicking on ‘**Change**’ button, the following box appears:



#### 1.7.1.2 Media Proxy: Associate/Disassociate to a GWC

In GWC Provisioning Panel a tabbed pane “**MediaProxy**” is added in order to manage association/disassociation to MGs.

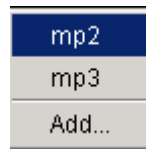
**Figure 4 GWC Provisioning Panel: MediaProxy tabbed pane added**

When the tab button is selected the list of all Media Proxies which are already associated to this GWC will appear in the table (Figure 4).

#### **✎ ASSOCIATE a MEDIA PROXY to a GWC**

After the Media Proxies are provisioned the user must then select the Media Proxies to be associated to a selected GWC. The action of associating a Media Proxy to a GWC will send the Media Proxy devices down to the GWC tables. A Media Proxy can be associated with up to 5 GWCs.

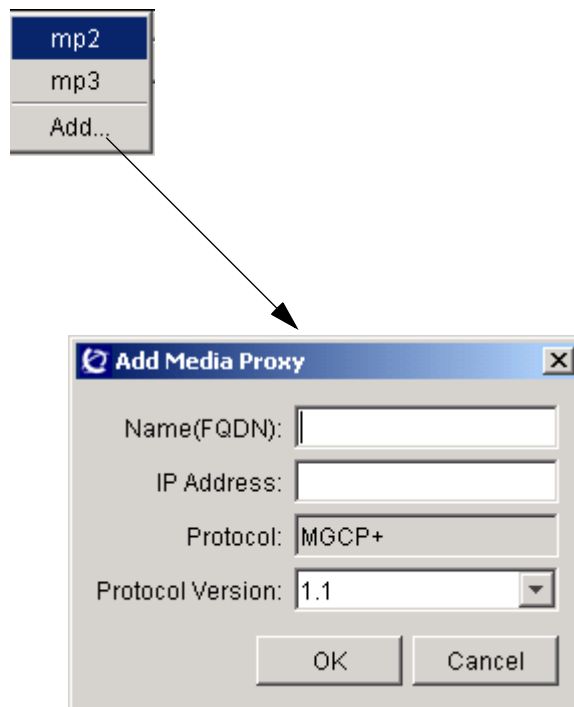
1. After clicking on “Retrieve All” (Figure 4), the list of existing associated MPs appears.
2. When click on “Associate” from MediaProxy Panel (Figure 4) the window “Associate Media Proxy” (Figure 5) is opened:

**Figure 5 “Associate Media Proxy” window**

- a. The “Associate Media Proxy” window lists all the existing MPs which are not yet associated to five GWCs.
- b. The user must **highlight** the one to be associated to the GWC.
- c. By pressing “**Associate**” button in window of Figure 5, the selected MP is associated to the GWC and the Media Proxy data is sent down to the GWC tables.

**Note:** a maximum of 20 Media Proxies can be associated to one GWC.

**3. “Add” button** gives the option to create more Media Proxies: a click on this button allowed the user to create a new MP (defines a new Media Proxy and adds it to the Database) and to associate it to GWC at once.

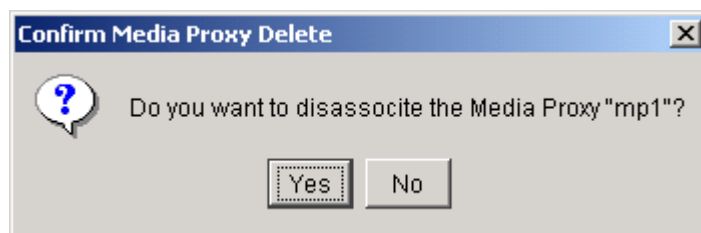




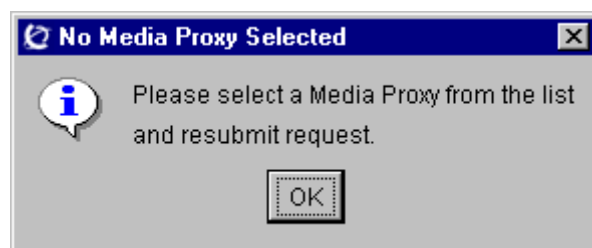
### ✕ **DISASSOCIATE a MEDIA PROXY from a GWC**

It is through this interface that the user must firstly remove all GWC associations before deleting a Media Proxy.

1. After clicking on “**Retrieve All**” (Figure 4), the list of existing associated MPs appears.
2. Select in “**Media Proxy List**” (Figure 4) the Media Proxy to be disassociated (by highlighting its line).
3. When click on “**Disassociate**” from MediaProxy Panel (Figure 4) a confirm box appears to ask the user to confirm his/her choice. When clicking “OK” the Media Proxy is disassociated.



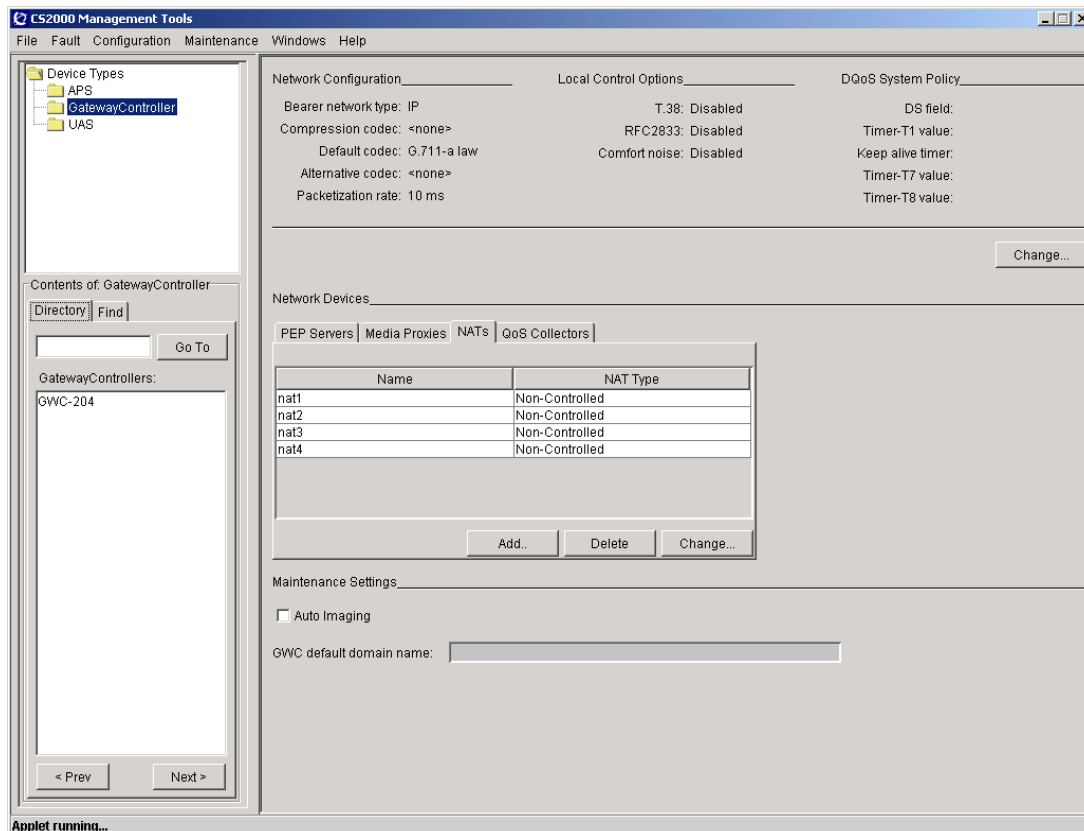
**Note:** If the user doesn't highlight the Media Proxies to be disassociated before clicking on “Disassociate” button the following dialog box appears:



## 1.7.1.3 Provisioning NATs

### 1.7.1.3.1 NAT: Add, Delete

In Network Configuration Panel, a tabbed pane is added for adding/deleting a NAT.

**Figure 6 New configuration: NATs tabbed pane**

A tabbed pane is added for NAT.

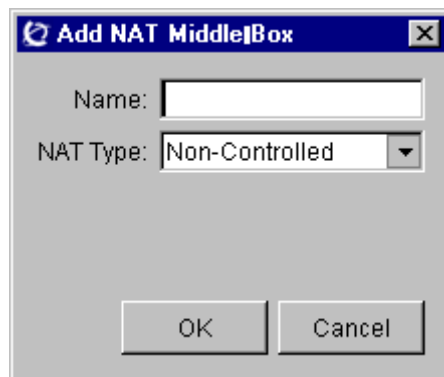
The user will be able to select among the two options: add a NAT and delete a NAT.

Change button: N/A.

✕ **Add button:** Defines a new NAT and adds it to the Database.

NAT data structure - expectations for the different fields:

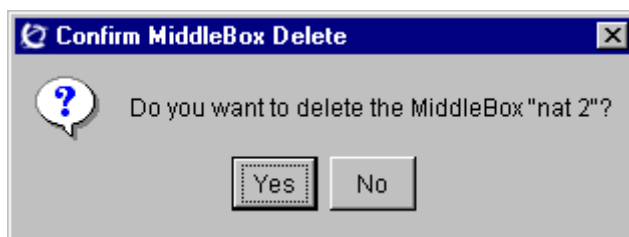
- Name (unique)
- NAT type: “None” or “Non-Controlled”



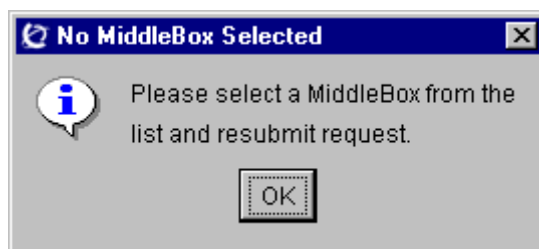
✕ **Delete button:** Delete a selected NAT.

- Select a NAT by highlighting its line, click on '**Delete**' button, a dialog box will ask the user to confirm his/her choice.

**Note:** The delete command will only be carried out if the NAT has no associations to MGs.



- If the user doesn't select a NAT before clicking on '**Delete**' button, the following box appears:



#### 1.7.1.3.2 NAT: Associate to a Media Gateway

In Menu "Configuration" select "Associate Media Gateway".

**Figure 7 New default configuration**

The screenshot shows a dialog box titled "Associate Media Gateway" with a close button (X) in the top right corner. The dialog contains several input fields and dropdown menus for configuring a media gateway. The fields are organized into sections: Gateway information, Signal Protocol, and Selected Profile Contents. At the bottom are "OK" and "Cancel" buttons.

| Field                     | Value            |
|---------------------------|------------------|
| Gateway name:             |                  |
| Gateway IP address:       |                  |
| Gateway controller name:  | GWC-             |
| Gateway profile name:     |                  |
| Gateway site name:        | LG               |
| Signal Protocol           |                  |
| Protocol type:            | NCS_PROTOCOL (1) |
| Protocol port:            | 2427             |
| Protocol version:         | 1.0              |
| Selected Profile Contents |                  |
| Reserved terminations:    |                  |
| GWC profile number:       |                  |
| Service type:             |                  |
| Category:                 |                  |

According to the Gateway Profile selected in “**Gateway Profile Name**”, the content of the interface will dynamically change.

When the user selects a gateway profile supporting the “Internet Transparency” service type (ITRANS), the “Internet Transparency” panel appears. In this case, the user has got 3 possibilities of configuration, detailed in the 3 sub-paragraphs below.

For information, the selection of a gateway profile supporting the “DQoS” service type adds a “Gateway PEP server” text field to the interface.

#### **1.7.1.3.2.1 MGs in the same domain as the Succession equipment.**

When the user doesn't select any option in the "Internet Transparency" box, the window is as in the figure below.

An example can be seen on the Diagram **Figure 1**:

MG1 and MG2 are in the same domain as the Succession equipment: no NAT traversal is required for signalling (MP can act as a NAT to allow communication to the public domain).

**Associate Media Gateway**

Gateway name: MG1

Gateway IP address: 47.49.55.10

Gateway controller name: GWC-73

Gateway profile name: ASKEY\_LINE\_GW\_4

Gateway site name: LG

Internet Transparency

☐ MG outside CS2K VPN, not behind NAT

NAT MiddleBox:

Signal Protocol

Protocol type: NCS\_PROTOCOL (1)

Protocol port: 2427

Protocol version: 1.0

Selected Profile Contents

Reserved terminations: 4

GWC profile number: 49

Service type: LINE ITRANS

Category: 2

OK Cancel

- Box not ticked

- No NAT name entered

The Gateway profile supports ITRANS => the Internet Transparency Panel is made visible

### 1.7.1.3.2.2 MGs in the public area (with public routable addresses) but not in a VPN.

An example can be seen on the Diagram **Figure 1**:

MG3 and MG4 are in the public area (with public routable addresses) but not in a VPN: no NAT traversal is required.

**Associate Media Gateway**

Gateway name: MG3

Gateway IP address: 47.49.55.14

Gateway controller name: GWC-73

Gateway profile name: ASKEY\_LINE\_GW\_4

Gateway site name: LG

Internet Transparency

☒ MG outside CS2K VPN, not behind NAT

NAT MiddleBox:

Signal Protocol

Protocol type: NCS\_PROTOCOL (1)

Protocol port: 2427

Protocol version: 1.0

Selected Profile Contents

Reserved terminations: 4

GWC profile number: 49

Service type: LINE ITRANS

Category: 2

OK Cancel

- Box ticked  
- not allowed to enter a NAT name (grayed out)

### 1.7.1.3.2.3 MGs in private area in VPNs and behind NATs.

An example can be seen on the Diagram **Figure 1**:

MG5 and MG6 are in the private area in VPNs and behind NATs (that may need the MP to resolve their addressing). The signalling has to go through the NAT.

**Associate Media Gateway**

Gateway name: MG5

Gateway IP address: 47.49.55.17

Gateway controller name: GWC-73

Gateway profile name: ASKEY\_LINE\_GW\_4

Gateway site name: LG

Internet Transparency

☐ MG outside CS2K VPN, not behind NAT

NAT MiddleBox: NAT1

Signal Protocol

Protocol type: NCS\_PROTOCOL (1)

Protocol port: 2427

Protocol version: 1.0

Selected Profile Contents

Reserved terminations: 4

GWC profile number: 49

Service type: LINE ITRANS

Category: 2

OK Cancel

The user selects a NAT by entering its name here

### 1.7.1.3.3 NAT: Disassociate Media Gateway

In Menu “**Configuration**” select “**Disassociate Media Gateway**”.

The disassociation of a NAT is done automatically when its associated MG is disassociated from the GWC.

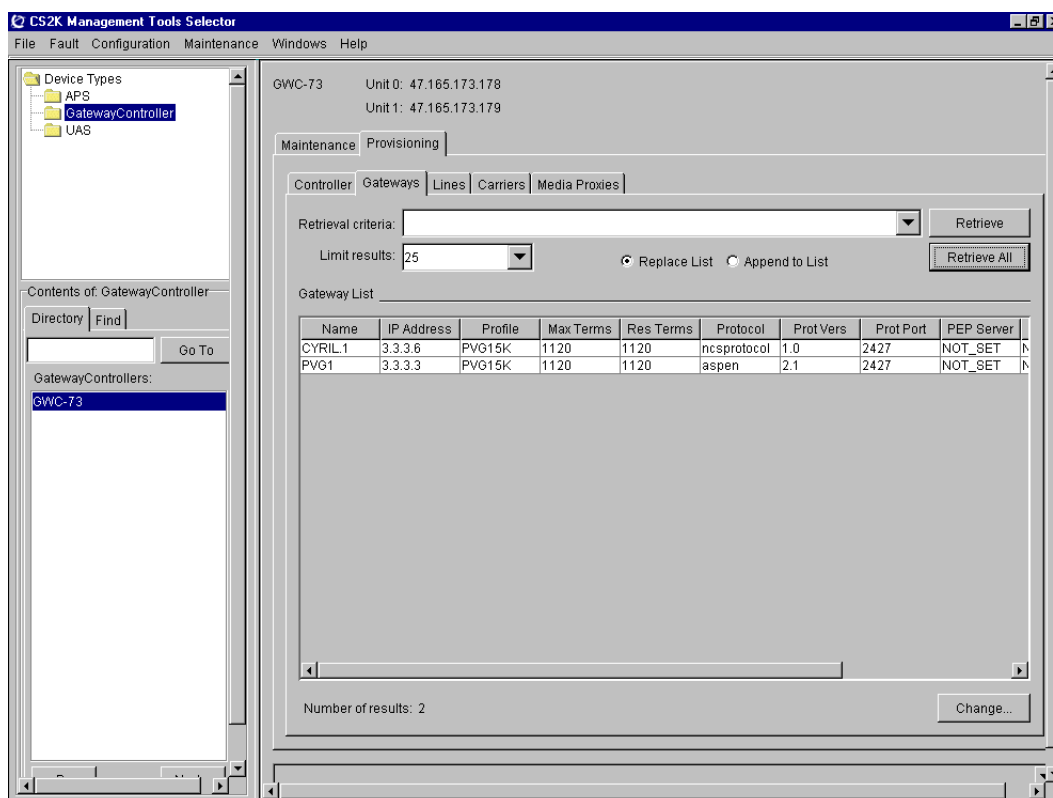
Another way to disassociate a NAT could be to change it to “None” (see “Change” option in paragraph 1.7.1.3.4 for more details).

#### 1.7.1.3.4 Display Gateways information

The Capability of displaying the NAT used by the gateways is available. The user can access it by selecting, in GWC Provisioning Panel, the Gateways tabbed pane.

For each Media Gateways the NATs information is displayed as below.

**Figure 8 New configuration**

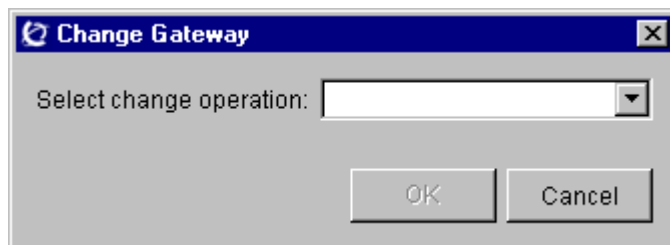


“Change” option:

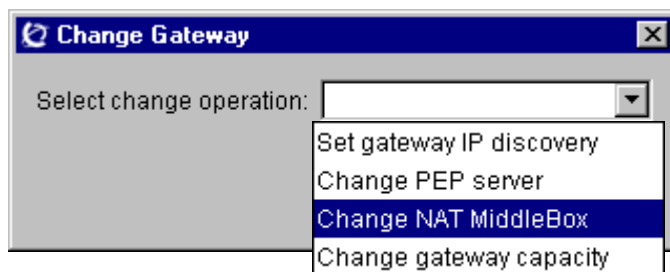
1. highlight the MG(s) that you want to change



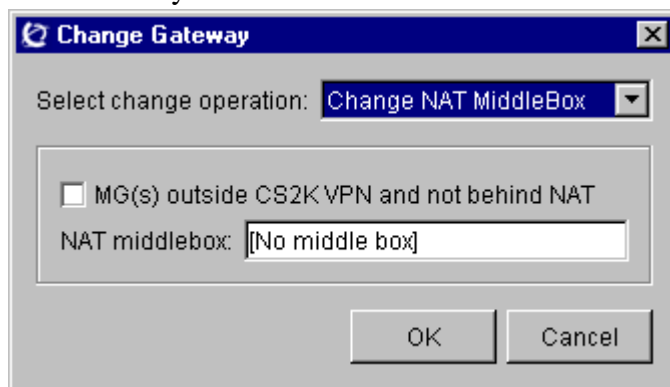
- click on the “Change” button and the following box is opened:



- Select the “Change” operation you want to perform:



- Select the field “Change NAT Middlebox” and Click “OK”. The user is able to modify the NAT middle box associated with the selected MG(s):



By default, the NAT middle box text field contains “[No middle box]”. This provides a way of disassociating a NAT from one/several gateway(s).

The user can also provide a valid NAT name or tick the “outside cs2k” checkbox.

## 1.8 Glossary

| Term  | Description                               |
|-------|-------------------------------------------|
| CORBA | Common Object Request Broker Architecture |

| Term   | Description                                   |
|--------|-----------------------------------------------|
| GUI    | Graphical User Interface                      |
| GWC    | Gateway Controller                            |
| GWC-EM | GWC Element Manager                           |
| IP     | Internet Protocol                             |
| MG     | Media Gateway                                 |
| MP     | Abbreviation in this document for Media Proxy |
| NAT    | Network Address Translation                   |
| SESM   | Succession Element and Sub-Element Manager    |
| SNMP   | Simple Network Management Protocol            |
| VPN    | Virtual Private Network                       |
| IAC    | Cable solution                                |
| IAW    | Wireline                                      |

***Product = CS 2000***

## **A00002644--Common Topology Identifier Provisioning**

### ***Functional Description***

#### **1.9 Applicable Solution(s)**

IAW, IAC

*Note:* This is an SN07 feature, included here by special request.

#### **1.10 Description**

The Internet Transparency feature, which allows Voice-Over-IP calls to take place in the presence of Network Address Translation (NAT)/IP VPNs, was introduced into Succession in release 6.1. This feature optimizes network resource utilization by determining whether the call path crosses NAT/VPNs and inserting Media Proxies if necessary.

However, calls spanning multiple Call Agents (CS2ks) may result in the insertion of one or more Media Proxies into the call path, even if the call is

contained within a single VPN. To avoid this, the inter-Call Agent trunks can be configured to be 'intra-domain' SIP-T trunks, thus causing the NAT/VPN information for both ends of the call to be compared. However, for this comparison to operate correctly, the following requirements must be met by the NAT's numerical identifier within the Call Agents (CS2ks), i.e. by the NAT's 'Middlebox ID':

- the middlebox ID for each NAT must be unique across all Call Agents
- each NAT must have the same Middlebox ID in all Call Agents

An example of this is shown in Figure 9.

This requirement on middlebox IDs is provided by the feature described in this note, hence allowing the configuration and use of intra-domain SIP-T trunks in SN07.

Each CS2k within the VoIP network must be allocated a unique Call Agent Identifier between 1 and 255. The user is responsible for administration of this number and its allocation among the CS2ks. Once a CS2k has been allocated a Call Agent ID, it should be provisioned into the CS2k Mgr using the capabilities provided by this feature. Ideally this should be coordinated with the CS2k upgrade to SN07, as described in 1.19.

When a NAT is provisioned, a middlebox ID is automatically generated by the CS2k Mgr. From SN07 onwards, the CS2k Mgr incorporates the Call Agent into this automatically generated number, using the provisioned Call Agent ID for that CS2k. This helps to ensure uniqueness of middlebox IDs across multiple CS2ks.

For the special case in which the same NAT is provisioned into multiple CS2ks, it is necessary to ensure that the middlebox ID used for this NAT is the same in all CS2ks. Hence the middlebox ID allocated when the NAT is first provisioned into a CS2k must be used when the NAT is provisioned in subsequent CS2ks. In order to enable this, this feature provides the capability to

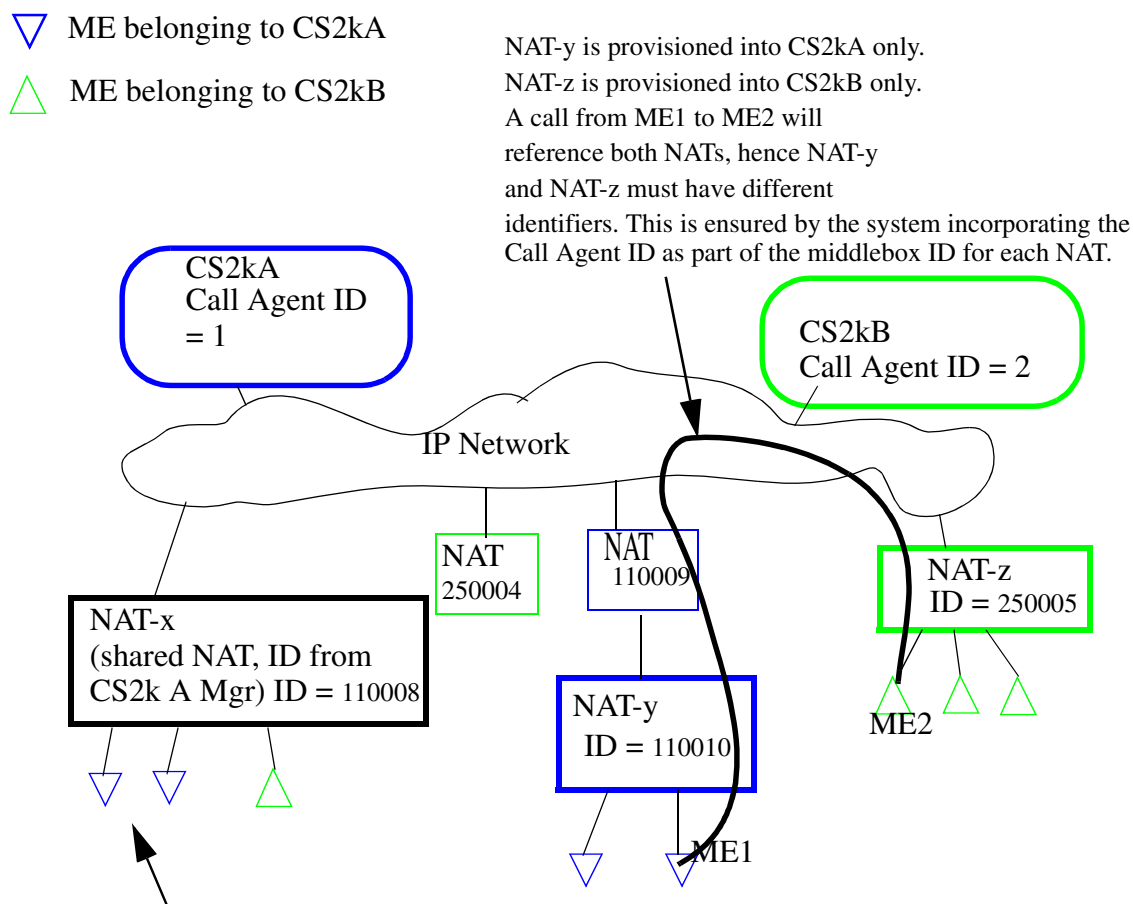
- read the middlebox ID of a provisioned NAT
- specify the middlebox ID as part of the data when provisioning a NAT.

Alternatively, the user may manually allocate any valid unique middlebox ID to a NAT and provision this value into all CS2ks, by-passing the CS2k Mgr middlebox-ID-auto-generation step. The middlebox ID must be an integer between 2 and 16777215 (ID = 1 is reserved by the system for internal use).

An example of ID allocations for a VoIP network with 2 CS2ks is shown in Figure 9.

If a NAT is provisioned into a CS2k Mgr and the automatically generated middlebox ID is then provisioned into other CS2k Mgrs, care must be taken when deleting this NAT. The NAT must be deleted last from the CS2kMgr that generated the middlebox ID - i.e. only after it has been deleted from all other CS2k Mgrs.

**Figure 9 VoIP network with multiple Call Agents (CS2ks)**



Some MEs behind NAT-x belong to CS2kA & others belong to CS2kB, hence NAT-x is provisioned into both Call Agents. NAT-x must have the same ID in both these Call Agents. Therefore NAT-x's identifier as allocated by CS2kA's Mgr (ID = 110008) must be specified when NAT-x is provisioned into CS2kB.

The user operations provided by this feature, which are available via the GUI client and via the XML OSS interface, (Figure 10 ) are:

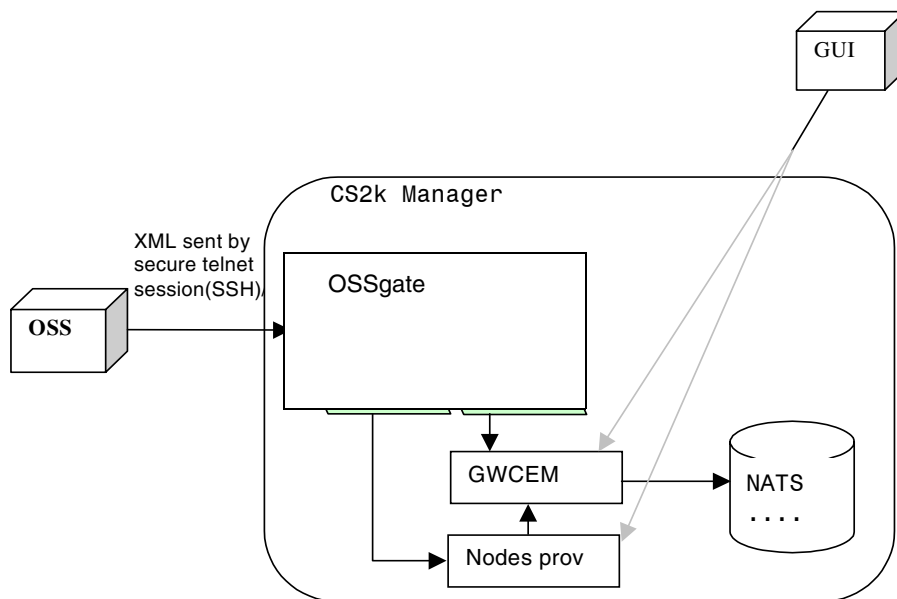
- Provision/set the Call Agent ID

- Display/list the Call Agent ID
- Specify the NAT middlebox ID during NAT provisioning
- Display/list the NAT Middlebox ID for a selected NAT
- Warning message on deletion of NAT middlebox.

In addition, the following internal functionality changes have been made as part of this feature:

- Automatic update of middlebox ids when Call Agent set for the first time
- Auto-generation of NAT and Pep Server middlebox id based on provisioned Call Agent ID

**Figure 10 GUI Client and OSSGate interfaces**



## 1.11 Hardware Requirements or Dependencies

No new hardware is required or introduced by this feature. The application components provided by this feature execute as part of the SESM.

## 1.12 Software Requirements or Dependencies

Dependencies:

- CR.Q00768898: Extend range in middlebox id in Gateway Controller

## 1.13 Limitations and restrictions

Upgrade to SN07 should be carried out as described in section 1.19

## 1.14 Interactions

The following existing GUIs have been modified:

- Maintenance Settings Panel (see Figure 13).
- Change Maintenance Settings Dialog (see Figure 14).
- Network Devices Panel, NATs tab (see Figure 20).
- Add NAT middlebox Dialog (see Figure 22, Figure 23)
- Delete NAT confirmation Dialog (see Figure 34)

The following existing XML commands have been modified:

- queryNAT (see Figure 26, Figure 28, Figure 30).
- addNAT (see Figure 32).

The following GUIs have been added:

- NAT middlebox ID display dialog (see Figure 21).

The following XML commands have been added:

- queryCallAgentId (see Figure 16)
- setCallAgentId (see Figure 18)

The on-line help facility will be updated with information on the use, syntax and valid values for all the above modifications/additions.

## 1.15 Applicable customer facing sections

Fault Management

Logs \_N/A\_

Alarms \_N/A\_

Configuration

---

|                                                 |              |
|-------------------------------------------------|--------------|
| Data Schema                                     | <u>_X_</u>   |
| User Interface                                  | <u>_X_</u>   |
| Element Management                              | <u>_N/A_</u> |
| Security                                        | <u>_N/A_</u> |
| Service Order                                   | <u>_N/A_</u> |
| Office Parameters                               | <u>_N/A_</u> |
| Accounting (includes AMA billing)               | <u>_N/A_</u> |
| Performance (includes operational measurements) | <u>_N/A_</u> |

## 1.16 Call Agent Identifier

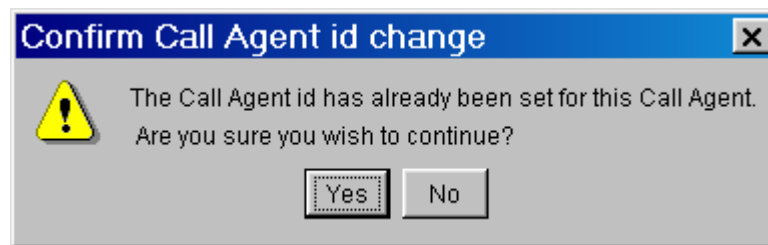
The Call Agent ID has an initial value of <not configured> in newly installed SN07 SESM systems. The Call Agent ID value should be set to a integer value between 1 and 255 by the user for normal operation. The Call Agent ID value must be set before the user can specify Middlebox IDs for NATs during NAT provisioning.

Note that in order to ensure optimum system operation is maintained during an upgrade, the Call Agent Id should be set just prior to upgrade of GWCs to SN07. Details of this are described in section 1.19.

The first time the Call Agent ID is set by the user, the system performs any necessary internal changes for NAT middleboxes which have already been provisioned, to incorporate the newly provisioned Call Agent ID into the NAT middlebox IDs. GWC units which need to be synchronized to this new data will be identified by having data synchronization alarms raised against them.

Ideally, the Call Agent ID should only be set once and then not changed. However, setting the Call Agent Id more than once is not prohibited by the CS2k mgr. Note that, for subsequent changes, the new Call Agent ID will only be used in the middlebox ID for NATs provisioned after the change has been made. The middlebox IDs of previously provisioned NATs are not modified. This ensures consistency, in case NATs have been provisioned into multiple Call Agents. If the user does attempt change the Call Agent ID, a warning confirmation message is displayed.

Figure 11



## 1.16.1 GUI Client

### 1.16.1.1 Display Call Agent ID

The Call Agent ID is displayed in the Gateway Controller Main Panel, in the 'Maintenance Settings' area. This is shown in Figure 12 and Figure 13.

Figure 12 Maintenance Setting Area, GWC management panel

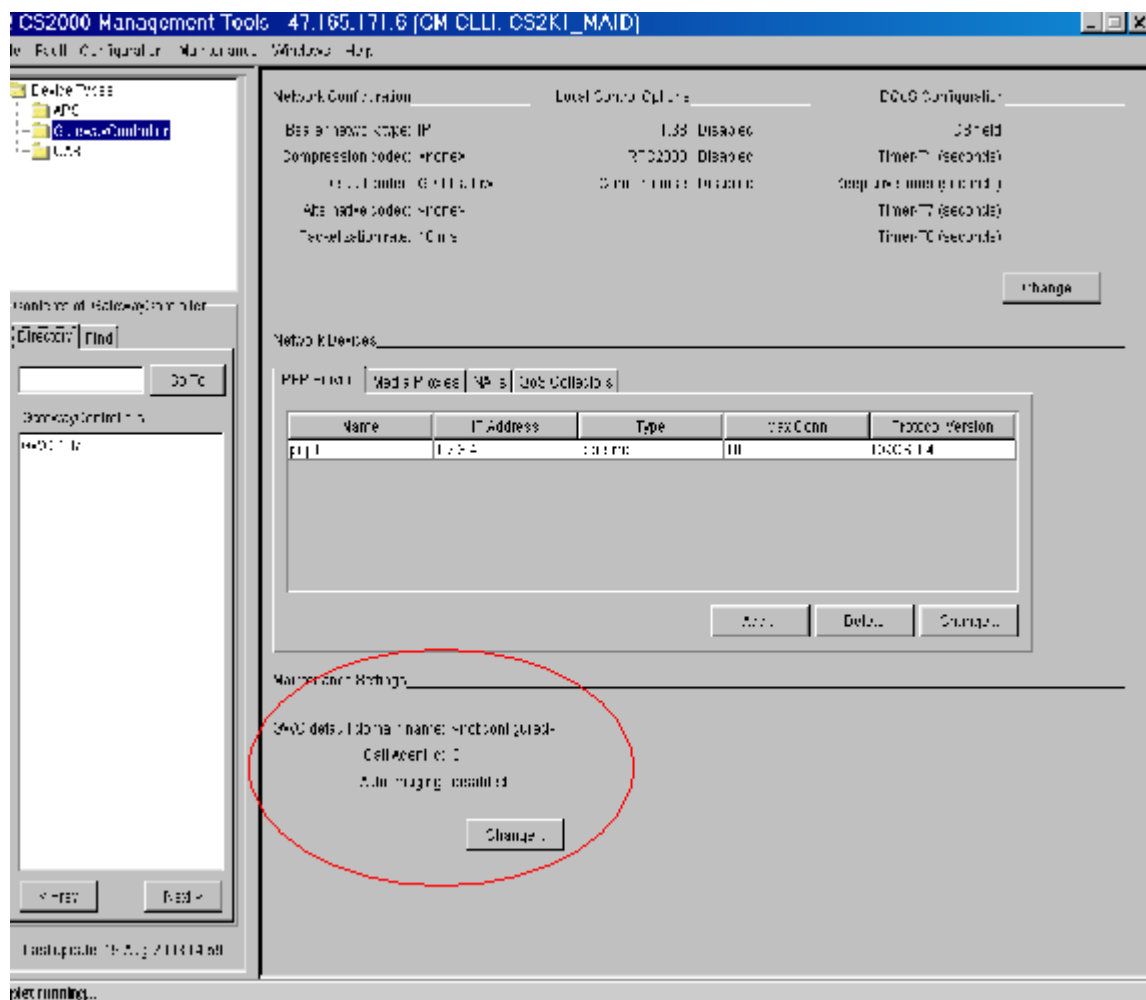
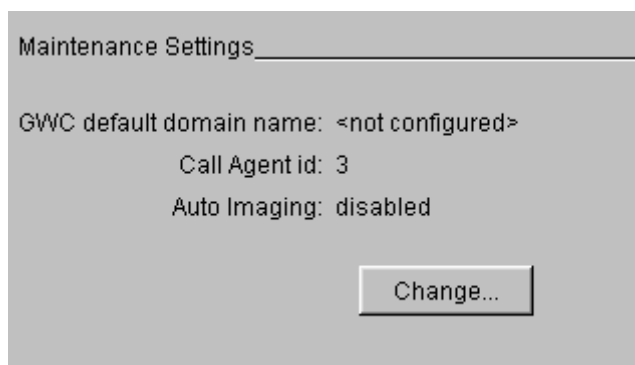
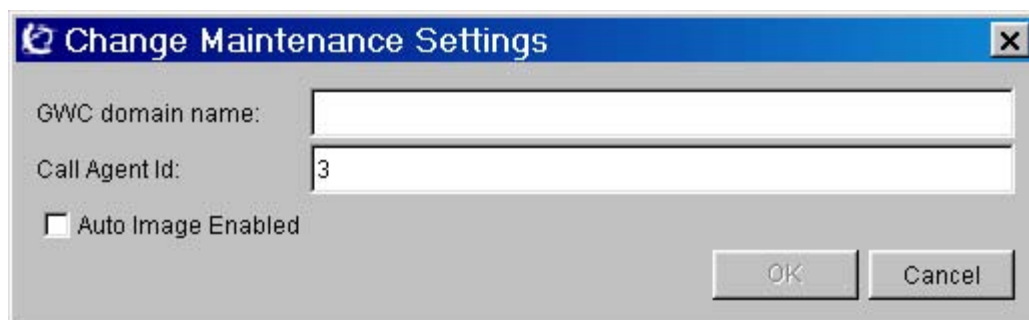




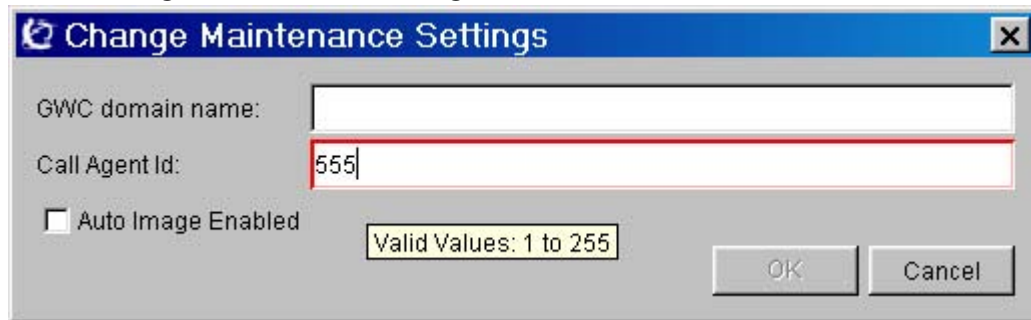
**Figure 13 Call Agent ID display and Change button**

#### 1.16.1.2 Provision Call Agent ID

The Call Agent ID can be provisioned/set using the 'Change' button in the Maintenance Setting area display (Figure 13). This displays the Maintenance Settings change dialog (Figure 14), which allows the user to set the Call Agent ID to an integer value between 1 and 255. Other maintenance settings may optionally be changed at the same time.

**Figure 14 Change Maintenance Settings Dialog**

Tool tips for the Call Agent ID are displayed when the cursor is placed within the text field. If the entered value is invalid, the text field is outlined in red and the OK button is disabled (Figure 15).

**Figure 15 Invalid Call Agent Id value**

Change Maintenance Settings

GWC domain name:

Call Agent Id:

☐ Auto Image Enabled

Valid Values: 1 to 255

OK Cancel

## 1.16.2 XML Interface

### 1.16.2.1 List Call Agent ID

The Call Agent ID may be retrieved via the XML interface using the following command (Figure 16). If the request is unsuccessful, an error message is returned as described in Appendix B.

**Figure 16 XML command queryCallAgentId**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <queryCallAgentId usn="1" version="1.0"/>
    </Methods>
  </Command>
</CommandList>
```

**Figure 17 XML Response for queryCallAgentId**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryCallAgentId usn="1" version="1.0">
        <ReturnData>
          <CallAgentId>3</CallAgentId>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryCallAgentId>
    </Methods>
  </Response>
</CommandList>
```

#### 1.16.2.2 Provision Call Agent ID

The Call Agent ID can be specified via the XML interface using the setCallAgentId command (Figure 18). If the Call Agent Id cannot be set, an error message is returned as described in Appendix B:

**Figure 18 XML Command: setCallAgentId**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <setCallAgentId usn="1" version="1.0">
        <Parameters>
          <CallAgentId>3</CallAgentId>
        </Parameters>
      </setCallAgentId>
    </Methods>
  </Command>
</CommandList>
```

**Figure 19 XML Response for setCallAgentId**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <setCallAgentId usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </setCallAgentId>
    </Methods>
  </Response>
</CommandList>
```

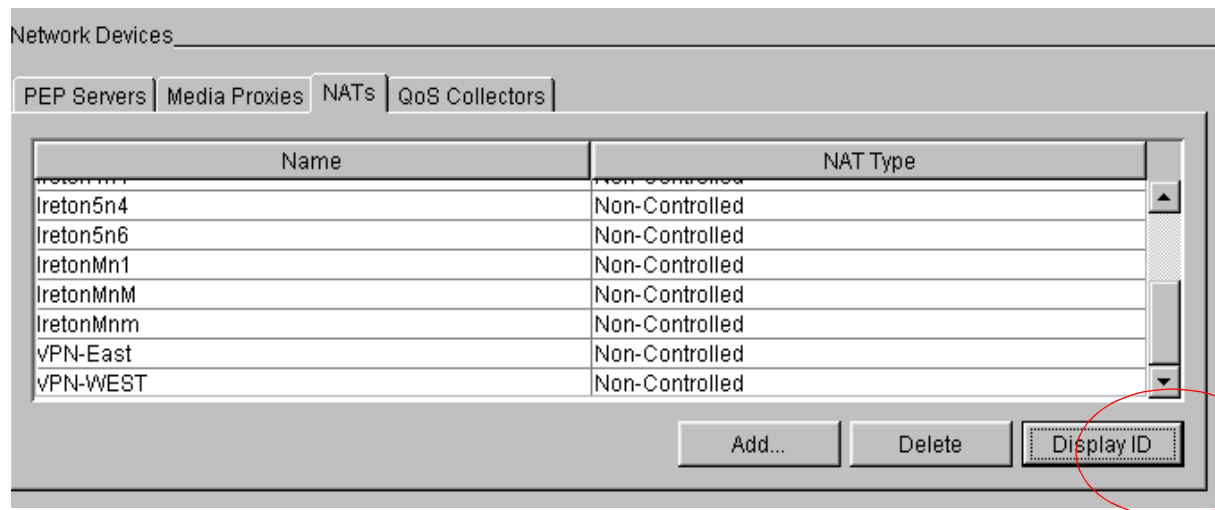
## 1.17 NAT middlebox Identifier

When the user provisions a NAT, the system will automatically allocate a NAT middlebox ID. However, some NATs are provisioned into multiple CS2k Mgrs. For these NATs, it is necessary for the user to override the automatic middlebox ID allocation when the NAT is provisioned into the second and subsequent CS2ks. This is done by specifying the NAT middlebox ID during provisioning of the NAT. The middlebox ID must be a unique integer between 2 and 16777215

### 1.17.1 GUI Client

#### 1.17.1.1 Display NAT middlebox ID

The middlebox ID for a NAT can be displayed via the 'Display ID' button on the NAT browser, which is available on the GWC Network Devices tabbed Panel

**Figure 20 NATs tab on Network Devices Panel**

This brings up an information box displaying the NAT middlebox ID Figure 21 ).

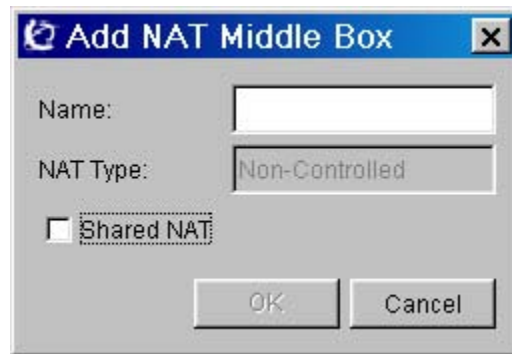
**Figure 21 NAT middlebox ID display dialog**

#### 1.17.1.2 Specify NAT middlebox ID during NAT provisioning

The middlebox ID for a NAT may be specified during NAT provisioning as follows:

- Use the 'Add' button on the NAT browser (see Figure 20) to open the NAT provisioning dialog box (Figure 22).

**Figure 22 Add NAT Middle Box dialog**



- Check the box marked 'Shared NAT'. This extends the dialog box to include the middlebox ID provisioning fields (Figure 23).
- Enter valid values for NAT name and NAT ID and press OK (Figure 24).

**Figure 23 Add NAT Middle Box dialog with Shared NAT checked**

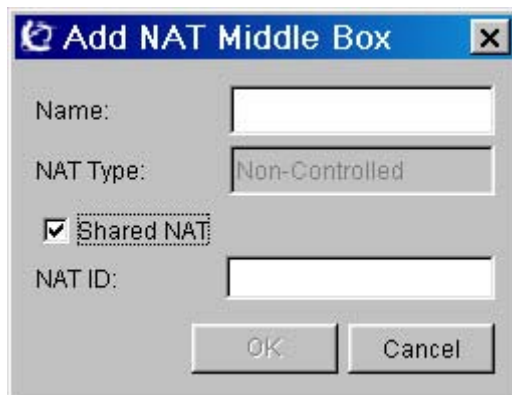
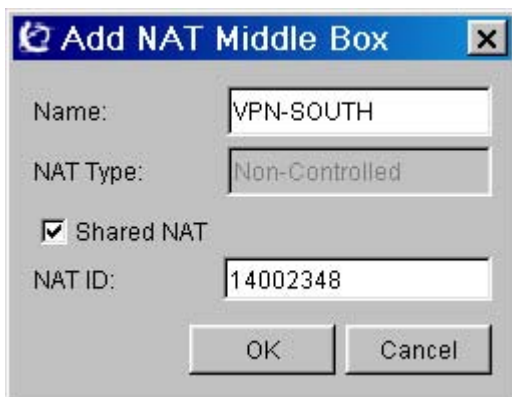


**Figure 24 Add NAT Middle Box with valid entries & OK enabled.**



Tool tips are displayed when the cursor is placed over each text field. If invalid values are entered, the text field with invalid data is outlined in red and the OK button is disabled (Figure 25).

**Figure 25 Add NAT Middle Box dialog with invalid entry for NAT ID**

The screenshot shows a dialog box titled "Add NAT Middle Box". It contains the following fields and controls:

- Name:** A text field containing "VPN-SOUTH".
- NAT Type:** A dropdown menu showing "Non-Controlled".
- Shared NAT:** A checkbox that is checked.
- NAT ID:** A text field containing "1400234898". This field is outlined in red, indicating an invalid entry.
- Valid Values:** A tooltip at the bottom of the NAT ID field displays "Valid Values: 1 to 16777215".

## 1.17.2 XML Interface command

### 1.17.2.1 List NAT middlebox ID

The NAT middlebox ID can be listed as part of the information returned in the queryNAT request. This is done by including the <ListNATid> tag, set to 'true', in the XML command. If the tag is set to 'false', the NAT middlebox information is listed without the middlebox ID. If this tag is omitted, the NAT middlebox information again is listed without the middlebox ID, for backwards compatibility with previous releases. The XML for this command is shown in Figure 26, Figure 28, Figure 30. Error messages returned are described in Appendix B.

**Figure 26 XML command to query specified NAT, including middlebox ID**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <Parameters>
          <NATName>NAT-A</NATName>
          <ListNATid>true</ListNATid>
        </Parameters>
      </queryNAT>
    </Methods>
  </Command>
</CommandList>
```

**Figure 27 XML response to query specified NAT, including middlebox ID**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <ReturnData>
          <NATName>NAT-A</NATName>
          <NATType>1</NATType>
          <NATId>131080</NATId>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryNAT>
    </Methods>
  </Response>
</CommandList>
```

**Figure 28 XML command to query all NATs on a given GWC, with middlebox ID**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <Parameters>
          <GWName>GWC-0</GWName>
          <ListNATId>true</ListNATId>
        </Parameters>
      </queryNAT>
    </Methods>
  </Command>
</CommandList>
```



**Figure 29 XML response for query all NATs on a given GWC, with middlebox ID**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <ReturnData>
          <NATName>NAT-B</NATName>
          <NATId>131081</NATId>
          <NATName>NAT-D</NATName>
          <NATId>131083</NATId>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryNAT>
    </Methods>
  </Response>
</CommandList>
```

**Figure 30 XML Command: query all NATs, with middlebox id**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <Parameters>
          <ListNATId>true</ListNATId>
        </Parameters>
      </queryNAT>
    </Methods>
  </Command>
</CommandList>
```

**Figure 31 XML Response: query all NATs, with middlebox id**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <ReturnData>
          <NATname>NAT-A</NATname>
          <NATid>131080</NATid>
          <NATname>NAT-B</NATname>
          <NATid>131081</NATid>
          <NATname>NAT-C</NATname>
          <NATid>131082</NATid>
          <NATname>NAT-D</NATname>
          <NATid>131083</NATid>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryNAT>
    </Methods>
  </Response>
</CommandList>
```

#### 1.17.2.2 Specify NAT middlebox ID during NAT provisioning

The middlebox ID can be specified during NAT provisioning over the XML interface by including the <NATid> tag in the addNAT command, as shown in Figure 32. Valid values must be provided for all fields. Error codes are given in Appendix B.

**Figure 32 XML Command: addNAT, including middlebox id:**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <addNAT usn="1" version="1.0">
        <Parameters>
          <NATname>nat1</NATname>
          <NATid>13378928</NATid>
        </Parameters>
      </addNAT>
    </Methods>
  </Command>
</CommandList>
```

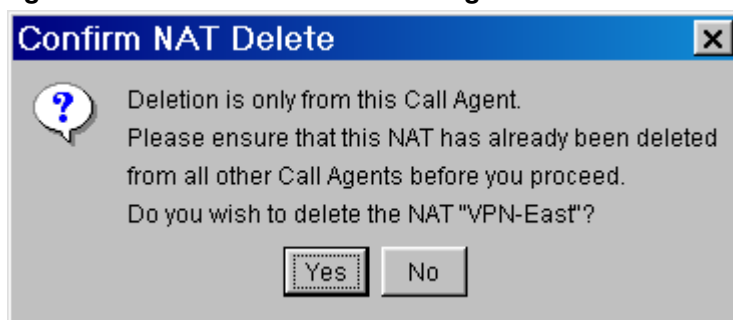
**Figure 33 XML Response: addNAT, including middlebox id:**

```
X<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <addNAT usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </addNAT>
    </Methods>
  </Response>
</CommandList>
```

## 1.18 NAT deletion

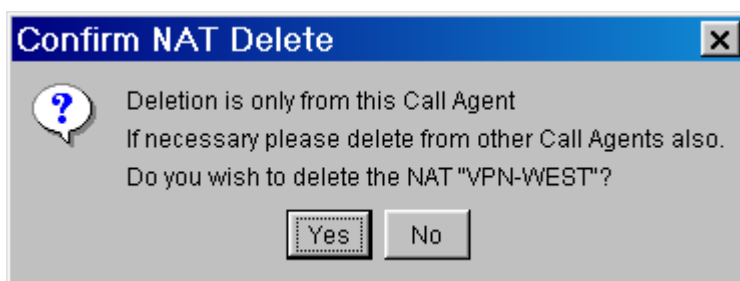
If the user has provisioned a NAT into multiple CS2ks, care should be taken when deleting the NAT. If the NAT middlebox ID used for the shared NAT has been automatically generated by one CS2k Mgr, the NAT should not be deleted from that CS2k Mgr while it is still provisioned in other CS2ks. It must be deleted from all other CS2k Mgrs first. The GUI client displays a warning when deletion of a NAT whose middlebox id has been generated by this CS2k Mgr is requested, as shown in Figure 34.

**Figure 34 Confirm NAT Delete dialog**



For other NATs, a general reminder is given that the delete operation results in deletion of the NAT middlebox from this CS2k only.

**Figure 35 Confirm NAT Delete dialog**



## 1.19 Upgrade to SN07

During an upgrade to SN07, the need to upgrade the middlebox IDs of already provisioned NATs means that there is a possibility of temporary increase in usage of Media Proxies, depending on the exact network configuration. Hence if Media Proxy resources have been engineered so that this may cause problems, the period of time during which there are GWCs at different software versions should be minimized. It is suggested that one of the following sequences of operation, A or B, is used for upgrade. In steps A & B,

‘Upgrade the CS2k Mgr’ refers in particular to upgrade of the Node Provisioning and GWC EM applications.

### **A. Upgrade without soak test**

1. Upgrade CS2k Mgr to SN07
2. Set a unique Call Agent ID. This causes the SN07 CS2k Mgr to generate new middlebox IDs for already provisioned NATs (and Pep Servers).
3. Upgrade all GWCs that will support internet transparency Media Endpoints to SN07. As part of this upgrade (in particular because of the busy/RTS/SWACT), the new middlebox IDs for already provisioned NATs will be downloaded to each GWC. During this step, GWCs with different versions of software may have different middlebox IDs for the same NAT and hence some additional Media Proxy usage may take place (depending on the exact network configuration and order in which GWCs are upgraded). Hence, if a temporary increase in Media Proxy usage is undesirable (e.g. for network engineering reasons), this step should be done within as short as possible a time window and during a low traffic period.
4. Repeat steps 1-3 for all other CS2ks in the network.
5. Intra-domain SIP-T trunks may now be configured.

### **B Upgrade with soak test**

1. Upgrade CS2k Mgr to SN07
2. Upgrade a small number of GWCs that support internet transparency Media Endpoints to SN07 for soak test
3. Once soak test is complete, set a unique Call Agent ID. This causes the SN07 CS2k Mgr to generate new middlebox IDs for already provisioned NATs (and Pep Servers).
4. Carry out a busy/RTS/SWACT for the (SN07) GWCs that have been soak tested. This will cause the new middlebox IDs to be downloaded to both sides of these GWCs.
5. Upgrade all other GWCs that will support internet transparency Media Endpoints to SN07. As part of this upgrade (in particular because of the busy/RTS/SWACT), the new middlebox IDs for already provisioned NATs will be downloaded to each GWC. During steps 4 & 5, GWCs with different versions of software may have different middlebox IDs for the same NAT and hence some additional Media Proxy usage may take place (depending on the exact network configuration and order in which GWCs are upgraded). Hence, if a temporary increase in Media Proxy usage is undesirable (e.g. for network

engineering reasons), steps 4 & 5 should be done within as short as possible a time window and during a low traffic period.

6. Repeat steps 1-5 for all other CS2ks in the network.

7. Intra-domain SIP-T trunks may now be configured.

## 1.20 Authorization for Commands

The security for the GUI Client and OSSgate interface includes support for permission or 'Authorization' levels for commands. Each command is associated with one or more user groups. In order to execute a command, a user must belong to at least one of the associated user groups. The user groups associated with the new /modified commands associated with this feature are specified in the table below.

**Table 1 Internet Transparency Commands Authorization**

| Command                                         | User Group |       |        |          |       |
|-------------------------------------------------|------------|-------|--------|----------|-------|
|                                                 | mgcadm     | mgcrw | mgcmte | mgcsprov | mgcro |
| <b>Display Call Agent ID (queryCallAgentId)</b> | X          | X     | X      | X        | X     |
| <b>Change Call Agent ID (setCallAgentId)</b>    | X          | X     |        |          |       |
| <b>Display NAT ID (queryNAT)</b>                | X          | X     | X      | X        | X     |
| <b>Provision NAT (addNAT)</b>                   | X          | X     |        |          |       |

## 1.21 Glossary

| Term  | Description                        |
|-------|------------------------------------|
| GUI   | Graphical User Interface           |
| GWC   | Gateway Controller                 |
| GWCEM | Gateway Controller Element Manager |
| ID    | Identifier                         |
| ME    | Media Endpoint                     |
| NAT   | Network Address Translation        |
| VPN   | Virtual Private Network            |

## 1.22 Appendix A: XML validation schemas

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    version="1.0"
    xml:lang="en" >

<!-- *****-->
<!-- * Define addNAT Method Parameters -->
<!-- *****-->

<xsd:complexType name="addNATmethodType">
    <xsd:all>
        <xsd:element name="Parameters" type="addNATparamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="addNATparamsType">
    <xsd:sequence>
        <xsd:element name="NATname" type="NoSpaceNameType" />
        <xsd:sequence minOccurs="0">
            <xsd:element name="NATid" type="xsd:integer" />
        </xsd:sequence>
    </xsd:sequence>
</xsd:complexType>
</xsd:schema>

<!-- *****-->
<!-- * Define queryNAT Method Parameters -->
<!-- *****-->

<xsd:complexType name="queryNATmethodType">
    <xsd:all>
        <xsd:element name="Parameters" type="queryNATparamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="queryNATparamsType">
    <xsd:sequence>
        <xsd:choice minOccurs="0">
            <xsd:element name="NATname" type="NoSpaceNameType" />
            <xsd:element name="GWCname" type="GWCNameType" />
        </xsd:choice>
        <xsd:choice minOccurs="0">
            <xsd:element name="ListNATid" type="NoSpaceNameType" />
        </xsd:choice>
    </xsd:sequence>
</xsd:complexType>

```

```

    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

<!-- *****-->
<!-- * Define setCallAgentId Method Parameters -->
<!-- *****-->

<xsd:complexType name="setCallAgentIdmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="setCallAgentIdparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="setCallAgentIdparamsType">
  <xsd:sequence>
    <xsd:element name="CallAgentId" type="xsd:integer" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>

<!-- *****-->
<!-- * Define queryCallAgentId Method Parameters -->
<!-- *****-->

<xsd:complexType name="setCallAgentIdmethodType">
  <xsd:all>
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
</xsd:schema>

<!-- *****-->
<!-- ** Global Attribute Groups Used by all schemas -->
<!-- *****-->

<!-- *****-->
<!-- * Define Common Usn_Version Attribute Group-->
<!-- *****-->

<xsd:attributeGroup name="Usn_VersionAttrbGroup" >
  <xsd:attribute name="usn" type="xsd:integer" use="required" />
  <xsd:attribute name="version" type="xsd:decimal" default="1.0" use="optional"/>
</xsd:attributeGroup>

<!-- *****-->
<!-- * Global Simple Types Used or Useable by all schemas follows: -->

```



```

<!-- *****-->

<!-- *****-->
<!-- * Define No Space Name Type -->
<!-- *****-->

<xsd:simpleType name="NoSpaceNameType">
  <xsd:restriction base="xsd:token">
    <xsd:minLength value="1" />
    <xsd:pattern value="\S{1,32}" />
  </xsd:restriction>
</xsd:simpleType>

<!-- *****-->
<!-- * Define GWCNameType-->
<!-- *****-->

<xsd:simpleType name="GWCNameType">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="GWC-\d\d?\d?" />
  </xsd:restriction>
</xsd:simpleType>

```

## 1.23 Appendix B: Error codes and messages

**Table 2 Return codes when command is unsuccessful**

| Cause of error                                                                                                 | Return code | Example return messages                                  |
|----------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------|
| Platform applications internal error: OSS Interface applications cannot connect to required server application | 302         | Interfacing error                                        |
| Unable to provision requested NAT because a database error occurred                                            | 303         | Database error occurred during setting of Call Agent Id. |
| Unable to provision requested NAT/Call Agent Id of problem with the GWCEM component of the CS2k Mgr.           | 304         | Element Manager Initial is at ion in progress            |

| Cause of error                                                                                           | Return code | Example return messages                            |
|----------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------|
| No NAT data for this query. e.g. no NAT meets selection criteria or the NAT/GWC specified does not exist | 305         | NAT not found<br>No NAT found for GWC              |
| User is not a member of any of the user groups allowed to perform this action                            | 501         | Insufficient permissions to perform this operation |

### 1.23.1 Example Error Message

```

<?xml version='1.0'?>
  <CommandList>
    <Response>
      <Interface>ITransIf</Interface>
      <Methods>
        <queryNAT usn="1.0" version="1.0">
          <ReturnData>
            <NATName>nat1111</NATName>
            <ReturnCode value= "305" text="NAT not found"/>
          </ReturnData>
        </queryNAT usn="1.0">
      </Methods>
    </Response>
  </CommandList>

```

## 1.24 Appendix C: XML Commands: description of method parameters

### 1.24.1 Parameter definitions

- **encoding??**
- **version** - The version refers to the version of the method or operation - e.g., the addNAT operation may have version 1.0 and 2.0, where version 1.0 takes parameters X and Y and version 2.0 takes parms X, Y, and Z. TYPE *decimal*.
- **usn** - Unique Sequence Number. This parameter is introduced to facilitate sending multiple XML commands in one file. This parameter value will be used to match the responses with the requests. TYPE *integer*.
- **ReturnCode value**- A numeric value indicating the result of the attempted operation (see Table 3, for range and definitions of each possible value). TYPE *string*.
- **Return code text**- Appropriate text that describes the result of the operation. TYPE *string*.

- **CallAgentId** - The unique integer that has been assigned by the user to this Call Agent (e.g. this CS2k). This must be a value between 1 and 255. TYPE *integer*.
- **ListNATid** - Indication of whether the NAT id should be included in the response to this command. Set to 'true' if the NATid is required and 'false' if not. TYPE *NoSpaceNameType*.
- **NATname** - The name of the NAT that this command applies to. TYPE *NoSpaceNameType*. (32 character token without spaces, see xsd definitions in Appendix A, section 1.22)
- **NATid** - The unique middlebox id for this NAT. This must be an integer between 2 and 16777215. TYPE *integer*.
- **NATType** - Indicates the type of NAT, in particular, NATType = 1 indicates an uncontrolled NAT. No other values are used in this release. TYPE *string*.
- **GWCname** - The name of the GWC that this command applies to. TYPE *GWCNameType* (string of form GWC-xxxx, see xsd definitions in Appendix A, section 1.22)

#### 1.24.2 Method Parameters

Method parameters are defined below. Input data is mandatory except where indicated otherwise.

1. **queryCallAgentId** - Method that gets the current value of the Call Agent Id for this Call Agent (CS2k). This method has the following parameters:
  - Input data:
    - usn
    - version
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - CallAgentId - The value of the Call Agent Id for this Call Agent (CS2k).
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
2. **setCallAgentId** - Method that sets to Call Agent Id for this Call Agent (CS2k) to the specified value. This method has the following parameters:
  - Input data:
    - usn
    - version

- CallAgentId - The desired value for the Call Agent Id for this Call Agent (CS2k).
- Output data:
  - usn (value should be the same as the input)
  - version (value should be the same as the input)
  - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
- 3. **queryNAT** - Method that gets the information regarding a NAT or set of NATs, depending on the parameters specified. If neither a NATname nor a GWCname is included, then information is returned for ALL NATs provisioned in this CS2k Mgr. This method has the following parameters:
  - Input data:
    - usn
    - version
    - NATname (optional, cannot be included as well as GWCname) - indicates the NAT for which information should be returned
    - GWCname (optional, cannot be included as well as NATname) - returns information for all NATs associated with this GWC
    - ListNATid (optional) - if set to true, this returns the NAT id as part information for each NAT, if set to false or if the parameter is omitted the NAT id is not returned.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - NATname
    - NATType (returned only when the NATname is specified)
    - NATid (returned only when ListNATid is set to 'true' in the input data)
- 4. **addNAT** - Method that provision a NAT into the CS2k Mgr. This method has the following parameters: If the NAT id is not specified then the CS2k Mgr generates a NAT middlebox id for the NAT.
  - Input data:
    - usn
    - version
    - NATname - unique name for the NAT to be provisioned

- NATid (optional) - indicates the middlebox id that should be allocated to this NAT.
- Output data:
  - usn (value should be the same as the input)
  - version (value should be the same as the input)
  - ReturnCode

***Product = CS 2000***

## **A00004741--Enabling TRKGRP OM on GEM and Support Nodal OMs**

### ***Functional Description***

#### **1.25 Applicable Solution(s)**

PT-IP, UA-IP

#### **1.26 Description**

This feature provides Nodal Based Operational Measurements for IW-IP nodes. These nodal statistics are necessary for Link Bandwidth Engineering and to determine the network usage and transmission errors.

The Nodal Based Operational Measurements includes the statistics for:

- Gigabit Ethernet Link usage
- Bearer traffic injected into the network.

To support above statistics two new Nodal Based OM groups are added by this activity:

- MNGEMLNK

This OM group has pegs for:

- The number of packets/octets transmitted/received on the Gigabit Ethernet Link connected to a IW-IP node.
- The number of packets/octets transmitted/received with different types of error.

- MNGEMTRF

This OM group has pegs for:

- The number of RTP packets/octetets transmitted/received for bearer traffic.
- The number of packets/octetets transmitted/received for different types of call.

## 1.27 Hardware Requirements or Dependencies

None

## 1.28 Software Requirements or Dependencies

This functionality requires SN08 load in the Call Server, and GEM RM.

## 1.29 Limitations and restrictions

- The OM peg counts stored in the IW-IP that have not been reported to the Call Server will not be maintained over IW-IP GEM Sparing and Restarts.
- The OM pegging for Voice Band Data connection shall be implemented in later release.

## 1.30 Interactions

None.

## 1.31 Glossary

| Term    | Description             |
|---------|-------------------------|
| CEM     | Common Equipment Module |
| GEM     | Gigabit Ethernet Module |
| IW Node | Interworking Node       |
| OM      | Operational Measurement |
| RM      | Resource Module         |

## 2: Performance for A00004741

### 2.1 Performance management strategy

This capability provides statistics which are necessary for Link Bandwidth Engineering and to determine the network usage and transmission errors.

### 2.2 Performance management tools and utilities

This feature provides Nodal Based Operational Measurements for IW-IP nodes.

Two new Nodal Based OM groups added by this activity are:

- MNGEMLNK - Statistics for Nodal Gigabit Ethernet Link usage.
- MNGEMTRF - Statistics for Nodal traffic usage and transmission errors.

To view the MNGEMLNK and MNGEMTRF, use the OMSHOW CI command as follows:

```
>OMSHOW MNGEMLNK ACTIVE
```

```
>OMSHOW MNGEMTRF ACTIVE
```

## 2.3 Performance Measurements (PM), Operational Measurements (OM), and stats

New Nodal Based OM groups added by this activity are:

- MNGEMLNK
- MNGEMTRF

### 2.3.1 PM, OM, and stats format

**Component:** IW-IP node

**Performance Measurement Name:** MNGEMLNK

**Performance Measurement Description:**

This OM group provides the statistics related to the Gigabit Ethernet Link connected to a particular IW-IP node. This information will be used for Gigabit Ethernet Link bandwidth Engineering.

**History:** Created in SN08

**Component:** IW-IP node

**Performance Measurement Name:** MNGEMTRF

**Performance Measurement Description:**

This OM group provides the usage statistics related to bearer traffic on the IW-IP nodes. These information will be used to identify the Nodal traffic usage in the network.

**History:** Created in SN08

## 2.3.2 OM Group - MNGEMLNK

### 2.3.2.1 OM description

OM Group MNGEMLNK

Multiservice Node Gigabit Ethernet Module Link Bandwidth Engineering

The purpose of this OM group is to provide Gigabit Ethernet Link usage statistics to assist with network bandwidth Engineering.

In this OM group, the pegs include:

- The number of packets/octets transmitted/received on the Gigabit Ethernet Link connected to a IW-IP node.
- The number of packets/octets transmitted/received with different types of error.

The Gigabit Ethernet Module (GEM) hardware is a Resource Module of IW-IP node. The GEM provides a 1 Gigabit/sec Ethernet network interface that will support up to 2016 DS0 voice channels over an IP based packet network.

### 2.3.2.2 Release history update

OM group MNGEMLNK is new in SN08

### 2.3.2.3 Registers

OM group registers display on the MAP terminal as follows:



**Figure 1 MNGEMLNK OM Group Display**

```

>omshow mngemlnk active

MNGEMLNK

CLASS: ACTIVE
START:2004/06/10 10:30:00 MON; STOP: 2004/06/10 10:31:51 MON;
SLOWSAMPLES:      2 ; FASTSAMPLES:      11 ;

      INFO (SOTS_NODE_INFO_TYPE)
      TXOCT    TXOCT2    RXOCT    RXOCT2
      TXPKT    TXPKT2    RXPKT    RXPKT2
      TXEROCT  TXEROCT2  RXEROCT  RXEROCT2
      TXERPKT  RXERPKT   CRCERPKT  UNDERPKT
      OVERPKT  SHORTPKT  LONGPKT

0

      SPM    0
      0      0      0      0
      0      0      0      0
      0      0      0      0
      0      0      0      0
      0      0      0      0

```

### 2.3.2.4 Group structure

OM group provides one tuple for each IW-IP node.

Key field: SPM PM Number, a number in the range 0 - 85

Info field: SPM PM Number, a number in the range 0 - 85

### 2.3.2.5 Associated OM groups

None

### 2.3.2.6 Associated functional groups

None

### 2.3.2.7 Associated functionality codes

None

### 2.3.2.8 OM group registers logic flow chart

The Gigabit Ethernet Link usage statistics are available in GigMAC chip of the GEM RM. This information is used for incrementing the OM Registers for that IW-IP node.

### **2.3.2.9 Register - TXOCT, TXOCT2**

#### **2.3.2.9.1 Register description**

Register TXOCT (Transmitted Octets) provides count for total number of bytes transmitted on a Gigabit Ethernet Link connected to a particular IW-IP node. Register TXOCT2 is an extension register for TXOCT.

The count is represented in Kilo Bytes (Scaled by factor of 1024).

#### **2.3.2.9.2 Register TXOCT release history update**

Register TXOCT is new in SN08.

#### **2.3.2.9.3 Associated registers**

None

#### **2.3.2.9.4 Associated logs**

None

### **2.3.2.10 Register - RXOCT, RXOCT2**

#### **2.3.2.10.1 Register description**

Register RXOCT (Received Octets) provides count for total number of bytes received on a GigE Link connected to a particular IW-IP node. Register RXOCT2 is an extension register for RXOCT.

The count is represented in Kilo Bytes (Scaled by factor of 1024).

#### **2.3.2.10.2 Register RXOCT release history update**

Register RXOCT is new in SN08.

#### **2.3.2.10.3 Associated registers**

None

#### **2.3.2.10.4 Associated logs**

None

### **2.3.2.11 Register - TXPKT, TXPKT2**

#### **2.3.2.11.1 Register description**

Register TXPKT (Transmitted Packets) provides count for total number of packets transmitted on a GigE Link connected to a particular IW-IP node. Register TXPKT2 is an extension register for TXPKT.

The count is represented in Kilo Packets (Scaled by factor of 1000).

#### **2.3.2.11.2 Register TXPKT release history update**

Register TXPKT is new in SN08.

**2.3.2.11.3 Associated registers**

None

**2.3.2.11.4 Associated logs**

None

**2.3.2.12 Register - RXPKT, RXPKT2****2.3.2.12.1 Register description**

Register RXPKT (Received Packets) provides count for total number of packets received on a GigE Link connected to a particular IW-IP node. Register RXPKT2 is an extension register for RXPKT.

The count is represented in Kilo Packets (Scaled by factor of 1000).

**2.3.2.12.2 Register RXPKT release history update**

Register RXPKT is new in SN08.

**2.3.2.12.3 Associated registers**

None

**2.3.2.12.4 Associated logs**

None

**2.3.2.13 Register - TXEROCT, TXEROCT2****2.3.2.13.1 Register description**

Register TXEROCT (Transmitted Error Octets) provides count for total number of bytes transmitted in errored packets on a GigE Link connected to a particular IW-IP node. Register TXEROCT2 is an extension register for TXEROCT.

**2.3.2.13.2 Register TXEROCT release history update**

Register TXEROCT is new in SN08.

**2.3.2.13.3 Associated registers**

None

**2.3.2.13.4 Associated logs**

None

**2.3.2.14 Register - RXEROCT, RXEROCT2****2.3.2.14.1 Register description**

Register RXEROCT (Received Error Octets) provides count for total number of bytes received in errored packets on a GigE Link connected to a particular IW-IP node. Register RXEROCT2 is an extension register for RXEROCT.

**2.3.2.14.2 Register RXEROCT release history update**

Register RXEROCT is new in SN08.

**2.3.2.14.3 Associated registers**

None

**2.3.2.14.4 Associated logs**

None

**2.3.2.15 Register - TXERPCT****2.3.2.15.1 Register description**

Register TXERPCT (Transmitted Error Packets) provides count for total number of errored packets transmitted on a GigE Link connected to a particular IW-IP node.

**2.3.2.15.2 Register TXERPCT release history update**

Register TXERPCT is new in SN08.

**2.3.2.15.3 Associated registers**

None

**2.3.2.15.4 Associated logs**

None

**2.3.2.16 Register - RXERPCT****2.3.2.16.1 Register description**

Register RXERPCT (Received Error Packets) provides count for total number of errored packets received on a GigE Link connected to a particular IW-IP node.

**2.3.2.16.2 Register RXERPCT release history update**

Register RXERPCT is new in SN08.

**2.3.2.16.3 Associated registers**

None

**2.3.2.16.4 Associated logs**

None

**2.3.2.17 Register - CRCERPCT****2.3.2.17.1 Register description**

Register CRCERPCT (Cyclic Redundancy Check Error Packets) provides count for total number of packets received with Cyclic Redundancy Check (CRC) errors on a GigElink connected to a particular IW-IP node.

**2.3.2.17.2 Register CRCERPKT release history update**

Register CRCERPKT is new in SN08.

**2.3.2.17.3 Associated registers**

None

**2.3.2.17.4 Associated logs**

None

**2.3.2.18 Register - UNDERPKT****2.3.2.18.1 Register description**

Register UNDERPKT (Undersize Packets) provides count for total number of undersize packets received on a GigE Link connected to a particular IW-IP node.

Undersize packet is one with less than 64 bytes.

**2.3.2.18.2 Register UNDERPKT release history update**

Register UNDERPKT is new in SN08.

**2.3.2.18.3 Associated registers**

None

**2.3.2.18.4 Associated logs**

None

**2.3.2.19 Register - OVERPKT****2.3.2.19.1 Register description**

Register OVERPKT (Oversize Packets) provides count for total number of oversize packets received on a GigE Link connected to a particular IW-IP node.

Oversize Packet is one with more than 1518 bytes.

**2.3.2.19.2 Register OVERPKT release history update**

Register OVERPKT is new in SN08.

**2.3.2.19.3 Associated registers**

None

**2.3.2.19.4 Associated logs**

None

### 2.3.2.20 Register - SHORTPKT

#### 2.3.2.20.1 Register description

Register SHORTPKT (Short Packets) provides count for total number of short packets (aka fragments) received, on a GigE Link connected to a particular IW-IP node.

Short Packet is one with less than 64 bytes and CRC error or alignment error.

#### 2.3.2.20.2 Register SHORTPKT release history update

Register SHORTPKT is new in SN08.

#### 2.3.2.20.3 Associated registers

None

#### 2.3.2.20.4 Associated logs

None

### 2.3.2.21 Register - LONGPKT

#### 2.3.2.21.1 Register description

Register LONGPKT (Long Packets) provides count for total number of long packets (aka jabber) received on a GigE Link connected to a particular IW-IP node.

Long Packet is one with more than 1518 bytes and CRC error or alignment error.

#### 2.3.2.21.2 Register LONGPKT release history update

Register LONGPKT is new in SN08.

#### 2.3.2.21.3 Associated registers

None

#### 2.3.2.21.4 Associated logs

None

### 2.3.3 OM Group - MNGEMTRF

#### 2.3.3.1 OM description

OM Group MNGEMTRF

Multiservice Node Gigabit Ethernet Module Traffic Engineering

The purpose of this OM group is to provide statistics of Nodal traffic usage.

In this OM group, the pegs include:

- The number of RTP packets transmitted/received for bearer traffic.

- The number packets transmitted/received for different types connections.

### 2.3.3.2 Release history update

OM group MNGEMTRF is new in SN08

### 2.3.3.3 Registers

OM group registers display on the MAP terminal as follows:

**Figure 2 MNGEMTRF OM Group Display**

```
>omshow mngemtrf active

MNGEMTRF

CLASS: ACTIVE
START:2004/06/10 10:30:00 MON; STOP: 2004/06/10 10:31:51 MON;
SLOWSAMPLES:      2 ; FASTSAMPLES:      11 ;

      INFO (SOTS_NODE_INFO_TYPE)
      TOTCONN      TXRTPOCT      TXRTPOC2      RXRTPOCT
      RXRTPOC2      G711MUCN      G711ACN      TXG711PK
      TXG711P2      RXG711PK      RXG711P2      G729CN
      TXG729PK      TXG729P2      RXG729PK      RXG729P2
      CCDCN         TXCCDPK       RXCCDPK       VBDCN
      TXVBDPK       RXVBDPK       T38CN        TXT38PK
      RXT38PK       RF2833CN      SLSUPCN

0
      SPM  0
      0          0          0          0
      0          0          0          0
      0          0          0          0
      0          0          0          0
      0          0          0          0
```

### 2.3.3.4 Group structure

OM group provides one tuple for each IW-IP node.

Key field: SPM PM Number, a number in the range 0 - 85

Info field: SPM PM Number, a number in the range 0 - 85

### 2.3.3.5 Associated OM groups

None

### 2.3.3.6 Associated functional groups

None

### 2.3.3.7 Associated functionality codes

None

### **2.3.3.8 OM group registers logic flow chart**

The registers in this group are incremented by the statistics collected at the end of each connection used for a call.

## **2.3.4 Register - TOTCONN**

### **2.3.4.1 Register description**

Register TOTCONN (Total Connections) provides count for total number connections handled by a particular IW-IP node.

### **2.3.4.2 Register TOTCONN release history update**

Register TOTCONN is new in SN08.

### **2.3.4.3 Associated registers**

None

### **2.3.4.4 Associated logs**

None

## **2.3.4.5 Register - G711MUCN**

### **2.3.4.5.1 Register description**

Register G711MUCN (G.711 MuLaw Connections) provides count for total number of G.711 MuLaw codec connections handled by a particular IW-IP node.

The IW-IP uses industry standard G.711 codec as a default codec for Mu-law and A-law at 10 and 20 milliseconds, to encode and decode TDM to and from packets transmitted via RTP over UDP over IP.

ITU-T G.711 is a standard to represent 8 bit compressed pulse code modulation (PCM) samples for signals of voice frequencies, sampled at the rate of 8000 samples/second. G.711 encoder will create a 64 Kbps bitstream. This standard has two forms, A-Law and  $\mu$ -Law.

### **2.3.4.5.2 Register G711MUCN release history update**

Register G711MUCN is new in SN08.

### **2.3.4.5.3 Associated registers**

None

### **2.3.4.5.4 Associated logs**

None

## **2.3.4.6 Register - G711ACN**

### **2.3.4.6.1 Register description**



Register G711ACN (G.711 A-Law Connections) provides count for total number of G.711 A-Law codec connections handled by a particular IW-IP node.

#### **2.3.4.6.2 Register G711ACN release history update**

Register G711ACN is new in SN08.

#### **2.3.4.6.3 Associated registers**

None

#### **2.3.4.6.4 Associated logs**

None

### **2.3.4.7 Register - G729CN**

#### **2.3.4.7.1 Register description**

Register G729CN (G.729 Connections) provides count for total number of G.729 connections handled by a particular IW-IP node.

#### **2.3.4.7.2 Register G729CN release history update**

Register G729CN is new in SN08.

#### **2.3.4.7.3 Associated registers**

None

#### **2.3.4.7.4 Associated logs**

None

### **2.3.4.8 Register - CCDCN**

#### **2.3.4.8.1 Register description**

Register CCDCN (Clear Channel Data Connections) provides count for total number of 64K Clear Channel Data (CCD) Connections handled by a particular IW-IP node.

Clear Channel Data (CCD) calls are raw data streams instead of digitized 8KHz audio.

#### **2.3.4.8.2 Register CCDCN release history update**

Register CCDCN is new in SN08.

#### **2.3.4.8.3 Associated registers**

None

#### **2.3.4.8.4 Associated logs**

None

### **2.3.4.9 Register - T38CN**

#### **2.3.4.9.1 Register description**

Register T38CN (T.38 Connections) provides count for total number of T.38 connections handled by a particular IW-IP node.

T.38 Protocol is used to transmit fax calls over the IP network.

#### **2.3.4.9.2 Register T38CN release history update**

Register T38CN is new in SN08.

#### **2.3.4.9.3 Associated registers**

None

#### **2.3.4.9.4 Associated logs**

None

### **2.3.4.10 Register - VBDCN**

#### **2.3.4.10.1 Register description**

Register VBDCN (Voice Band Data Connections) provides count for total number of Voice Band Data (VBD) Connections handled by a particular IW-IP node.

VBD will allow pass-through of inband data over established voice channels for packet networks.

#### **2.3.4.10.2 Register VBDCN release history update**

Register VBDCN is new in SN08.

#### **2.3.4.10.3 Associated registers**

None

#### **2.3.4.10.4 Associated logs**

None

### **2.3.4.11 Register - RF2833CN**

#### **2.3.4.11.1 Register description**

Register RF2833CN (RFC2833 Connections) provides count for total number of RFC2833 connections handled by a particular IW-IP node.

The RFC2833 is used for tone transmission in all codec types. The speech compression can greatly impair the ability of downstream systems to recognize in-band DTMF tones. RFC2833 provides solution for this problem. The special RTP data packets will be transmitted instead of generating the tones at the ingress gateway. These RTP packets will instruct the downstream gateway to generate the appropriate tones.

**2.3.4.11.2 Register RF2833CN release history update**

Register RF2833CN is new in SN08.

**2.3.4.11.3 Associated registers**

None

**2.3.4.11.4 Associated logs**

None

**2.3.4.12 Register - TXRTPPK, TXRTPPK2****2.3.4.12.1 Register description**

Register TXRTPPK (Transmitted RTP Packets) provides count for total number of RTP packets transmitted from a IW-IP node. Register TXRTPPK2 is an extension register for TXRTPPK.

**2.3.4.12.2 Register TXRTPPK release history update**

Register TXRTPPK is new in SN08.

**2.3.4.12.3 Associated registers**

None

**2.3.4.12.4 Associated logs**

None

**2.3.4.13 Register - RXRTPPK, RXRTPPK2****2.3.4.13.1 Register description**

Register RXRTPPK (Received RTP Packets) provides count for total number of RTP packets received for a IW-IP node. Register RXRTPPK2 is an extension register for RXRTPPK.

**2.3.4.13.2 Register RXRTPPK release history update**

Register RXRTPPK is new in SN08.

**2.3.4.13.3 Associated registers**

None

**2.3.4.13.4 Associated logs**

None

**2.3.4.14 Register - TXG711PK, TXG711P2****2.3.4.14.1 Register description**

Register TXG711PK (Transmitted G.711 Connection Packets) provides count for total number of RTP packets transmitted for G.711 connections handled by a particular IW-IP node. Register TXG711P2 is an extension register for TXG711PK.

**2.3.4.14.2 Register TXG711PK release history update**

Register TXG711PK is new in SN08.

**2.3.4.14.3 Associated registers**

None

**2.3.4.14.4 Associated logs**

None

**2.3.4.15 Register - RXG711PK, RXG711P2****2.3.4.15.1 Register description**

Register RXG711PK (Received G.711 Connection Packets) provides count for total number of RTP packets received for G.711 connections handled by a particular IW-IP node. Register RXG711P2 is an extension register for RXG711PK.

**2.3.4.15.2 Register RXG711PK release history update**

Register RXG711PK is new in SN08.

**2.3.4.15.3 Associated registers**

None

**2.3.4.15.4 Associated logs**

None

**2.3.4.16 Register - TXG729PK, TXG729P2****2.3.4.16.1 Register description**

Register TXG729PK (Transmitted G.729 Connection Packets) provides count for total number of RTP packets transmitted for G.729 connections handled by a particular IW-IP node. Register TXG729P2 is an extension register for TXG729PK.

**2.3.4.16.2 Register TXG729PK release history update**

Register TXG729PK is new in SN08.

**2.3.4.16.3 Associated registers**

None

**2.3.4.16.4 Associated logs**

None

**2.3.4.17 Register - RXG729PK, RXG729P2****2.3.4.17.1 Register description**

Register RXG729PK (Received G.729 Connection Packets) provides count for total number of RTP packets received for G.729 connections handled by a

particular IW-IP node. Register RXG729P2 is an extension register for RXG729PK.

#### **2.3.4.17.2 Register RXG729PK release history update**

Register RXG729PK is new in SN08.

#### **2.3.4.17.3 Associated registers**

None

#### **2.3.4.17.4 Associated logs**

None

### **2.3.4.18 Register - TXCCDPK**

#### **2.3.4.18.1 Register description**

Register TXCCDPK (Transmitted Clear Channel Data Connection Packets) provides count for total number of RTP packets transmitted for Clear Channel Data connections handled by a particular IW-IP node.

#### **2.3.4.18.2 Register TXCCDPK release history update**

Register TXCCDPK is new in SN08.

#### **2.3.4.18.3 Associated registers**

None

#### **2.3.4.18.4 Associated logs**

None

### **2.3.4.19 Register - RXCCDPK**

#### **2.3.4.19.1 Register description**

Register RXCCDPK (Received Clear Channel Data Connection Packets) provides count for total number of RTP packets received for Clear Channel Data connections handled by a particular IW-IP node.

#### **2.3.4.19.2 Register RXCCDPK release history update**

Register RXCCDPK is new in SN08.

#### **2.3.4.19.3 Associated registers**

None

#### **2.3.4.19.4 Associated logs**

None

### **2.3.4.20 Register - TXT38PK**

#### **2.3.4.20.1 Register description**

Register TXT38PK (Transmitted T38 Connection packets) provides count for total number of packets transmitted for T.38 connections handled by a particular IW-IP node.

#### **2.3.4.20.2 Register TXT38PK release history update**

Register TXT38PK is new in SN08.

#### **2.3.4.20.3 Associated registers**

None

#### **2.3.4.20.4 Associated logs**

None

### **2.3.4.21 Register - RXT38PK**

#### **2.3.4.21.1 Register description**

Register RXT38PK (Received T.38 Connection Packets) provides count for total number of packets received for T.38 connections handled by a particular IW-IP node.

#### **2.3.4.21.2 Register RXT38PK release history update**

Register RXT38PK is new in SN08.

#### **2.3.4.21.3 Associated registers**

None

#### **2.3.4.21.4 Associated logs**

None

### **2.3.4.22 Register - TXVBDPK**

#### **2.3.4.22.1 Register description**

Register TXVBDPK (Transmitted Voice Band Data Connection Packets) provides count for total number of packets transmitted for Voice Band Data connections handled by a particular IW-IP node.

#### **2.3.4.22.2 Register TXVBDPK release history update**

Register TXVBDPK is new in SN08.

#### **2.3.4.22.3 Associated registers**

None

#### **2.3.4.22.4 Associated logs**

None

### **2.3.4.23 Register - RXVBDPK**

#### **2.3.4.23.1 Register description**

Register RXVBDPK (Received VBD Connection Packets) provides count for total number of packets received for Voice Band Data connections handled by a particular IW-IP node.

#### **2.3.4.23.2 Register RXVBDPK release history update**

Register RXVBDPK is new in SN08.

#### **2.3.4.23.3 Associated registers**

None

#### **2.3.4.23.4 Associated logs**

None

### **2.3.4.24 Register - SLSUPCN**

#### **2.3.4.24.1 Register description**

Register SLSUPCN (Silence Suppression Connections) provides count for total number of Silence Suppression connections handled by a particular IW-IP node.

As much as 50% of human speech consists of silence resulting from pauses between words or breaks in the conversation. Most of the codecs, such as G.723 recognize silence via a Voice Activity Detector (VAD), and transmit small Silence Descriptor (SID) packets instead of empty voice packets. Since true silence is unnatural, many receiving codecs generate background comfort noise (CNG) based on level and spectral information passed in the Silence Descriptor Packets.

#### **2.3.4.24.2 Register SLSUPCN release history update**

Register SLSUPCN is new in SN08.

#### **2.3.4.24.3 Associated registers**

None

#### **2.3.4.24.4 Associated logs**

None

***Product = CS 2000***

**A00005932--Removing Loopback Trunks in CEPT DISA calls for Remote Feature Activation**

## ***Functional Description***

### **1.1 Applicable Solution(s)**

DMS

### **1.2 Description**

#### **1.2.1 Introduction**

This feature enhances the digit collection in DISA features which are CEPT Call Forwarding Remote Access (CFRA) and CEPT Remote Access (CEPTRA). In existing functionality, digit collection is performed via loopback CAS trunks for all originating agents although they have capability to use UTR; that means, following kinds of originating agents below, loopback trunk is inserted between the agent and DISA feature by default:

- ISDN BRI lines
- ETSI ISUP trunks
- ETSI PRI trunks

This feature changes this behavior, and provides flexibility in digit collection as in following hierarchical order.

- 1 collect digits via UTR if possible
- 2 collect digits via DTMF receiver (for PRI agents only)
- 3 collect digits via LOOPBACK trunk

This feature provides the possibility not to use superfluous loopback equipment and optimize the digit collection for mentioned agents on CEPT markets; when the user of CFRA/CEPTRA feature will need to send digits for remote call activation, UTR or DTMF receivers (on MTMs) will be used for it. If both of them are not available, loopback trunk will be inserted as in existing functionality.

*Note: Throughout this document, “originating agent” refers to the originating agent of the call in the switch where DISA feature is located on.*

#### **1.2.2 General Considerations**

This feature is applicable for only CEPT features related with DISA framework, and provides the algorithm as explained below.

- a. Firstly, digit collection via UTR is tried to perform if it's already available.
- b. Secondly, if UTR is not available for originating agent, digit collection via DTMF receiver on MTMs is tried to perform. (for PRI agents only)



- c. Thirdly, if both of them are not available, digit collection is performed via LOOPBACK trunks.

The following table illustrates the originating agents versus supported digit collection types.

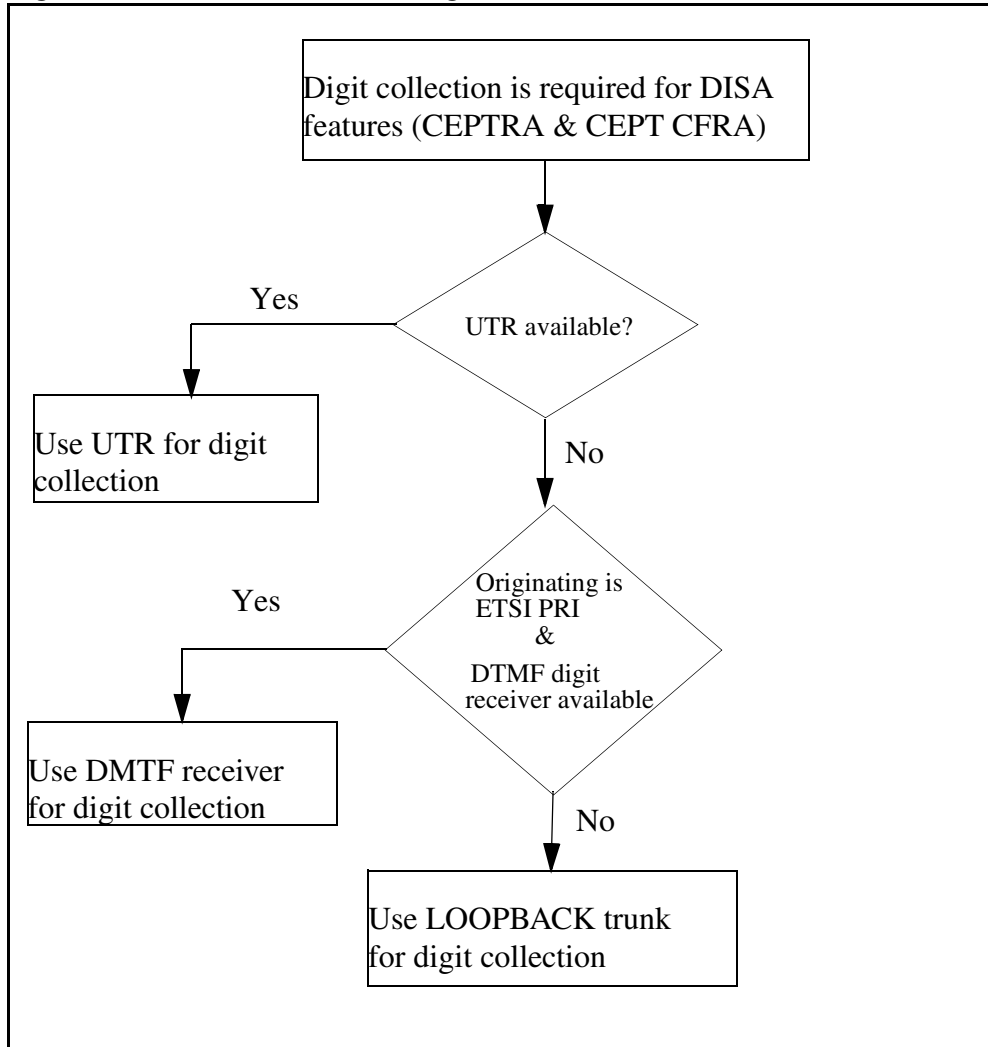
**Table 1 Supported digit collection types versus originating agents**

| Originating Agents                | Digit collection type |                         |                     |
|-----------------------------------|-----------------------|-------------------------|---------------------|
|                                   | via UTR               | via DTMF digit receiver | via LOOPBACK trunks |
| ETSI ISUP                         | X                     |                         | X                   |
| ETSI PRI                          | X                     | X                       | X                   |
| R1 (NTLS01, 02, 09),<br>R2 (Base) | X                     |                         |                     |
| ETSI BRI lines                    | X                     |                         | X                   |
| IBN/EBS lines                     | X                     |                         |                     |

X abbreviates this type of digit collection is supported on that agent.

As seen from Table 1, Digit collection via DTMF digit receiver cards is supported for only ETSI PRI trunks on which digit collection can be performed by UTR or Loopback trunks also.

Algorithm of choosing of which digit collection type used is simple. UTR has the first priority, DTMF digit receiver has the second, whereas loopback trunk has the last priority. The functional behavior diagram is as shown below.

**Figure 3 Functional Behavior Diagram**

### 1.3 Hardware Requirements or Dependencies

The RCVRDGT pool will be used as DTMF digit receiver in this activity, and digit receiver cards (2X48xx, where xx refers to "AB, BA, CC") should be located in MTMs.

Table RECEIVER should be provisioned as illustrated in Figure 2 below for using DTMF digit receiver in DISA calls. In order to be in service, each RCVRDGT must be taken in service by "**bsy;rts**" using the "**mapci;mtc;trks;ttp**" level.

**Figure 4 DTMF digit receiver provisioning**

|                 |   |         |          |        |      |         |
|-----------------|---|---------|----------|--------|------|---------|
| TABLE: RECEIVER |   |         |          |        |      |         |
| >lis all        |   |         |          |        |      |         |
| TOP             |   |         |          |        |      |         |
|                 |   | RCVRKEY | RCVRTYPE | TMTYPE | TMNO | TMCKTNO |
| CARDCODE        |   |         |          |        |      |         |
| -----           |   |         |          |        |      |         |
| RCVRDGT         | 0 | D       | MTM      | 0      | 6    | 2X48CC  |
| RCVRDGT         | 1 | D       | MTM      | 0      | 7    | 2X48CC  |

## 1.4 Software Requirements or Dependencies

N/A

## 1.5 Limitations and restrictions

In case of originating agent is ETSI PRI agent, Dial Tone is applied to the subscriber instead of SDT where it requires.

## 1.6 Interactions

N/A

## 1.7 Applicable customer facing sections

Fault Management

Logs

\_\_\_\_\_

Alarms

\_\_\_\_\_

Configuration

Data Schema

\_\_\_\_\_

User Interface

\_\_\_\_\_

Element Management

\_\_\_\_\_

Security

\_\_\_\_\_

Service Order

\_\_\_\_\_

Office Parameters

\_\_\_\_\_

Accounting (includes AMA billing)

\_\_\_\_\_

Performance (includes operational measurements)

\_\_\_\_\_

## 1.8 Glossary

| Term | Description                                        |
|------|----------------------------------------------------|
| BRI  | Basic Rate Interface                               |
| CAS  | Channel Associated Signaling                       |
| CEPT | Counsel for European Postal and Telecommunications |
| DISA | Direct Inward System Access                        |
| DTMF | Dual-Tone Multifrequency                           |
| DTM  | Digital Trunk Module                               |
| EBS  | Electronic Business Set                            |
| ETSI | European Telecommunications Standards Institute    |
| IBN  | International Business Network                     |
| ISDN | Integrated Services Digital Network                |
| MTM  | Maintenance Trunk Module                           |
| SDT  | Special Dial Tone                                  |
| UTR  | Universal Tone Receiver                            |

***Product = CS 2000***

## **A00006226--NTPOLL: Restructuring and Table Control**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS

#### **1.2 Description**

This feature, “NTPOLL: RESTRUCTURING and TABLE CONTROL” (A00006226), is scheduled for release in SN08.

##### **1.2.1 NTPOLL Background**

NTPOLL is an existing DMS feature which automatically polls various data from the switch and stores the results in data files on either SFDEV or NTDEV.

NTDEV is a virtual type DMS disk similar to SFDEV but which has been set aside specifically for storage of the poll data files. Typically, NTDEV stores the results of the polling, although the option to use SFDEV exists.

The output of the polling is one or several poll data files named POLLDATA, POLLDATA1, POLLDATA2, POLLDATA3, etc. The maximum size of each file is limited (to approximately 30,000 lines), so when a poll data file reaches its maximum length, it is closed and a new file (named with the next number in the numbering scheme) is opened. A small switch might only output one POLLDATA file during a polling. However, large switches have been known to output as many as four or five POLLDATA files. Optionally, these poll data files may be compressed automatically. Compressed files are denoted by the letter “Z” (ex. POLLDATAZ, POLLDATA1Z, POLLDATA2Z, etc.).

The data polled and collected by the system is currently defined by the system. There are two types of poll steps done during the polling. A “table step” is simply the collection of data from a DMS table (either listings of tuples or a count of tuples in the table). A “complex step” involves the collection of various other types of data from the switch, for example software version, patch, SOC, DMSMON, memory, and other configuration information. In a full polling, there are currently over 440 total polling steps. Approximately 85% of the steps are table steps.

Two CI commands are used in the administration of polling:

- POLLSCHD - used for the weekly scheduling of pollings, defining polling parameters (ex. date and time of the polling, disk devices to use and whether to compress or not), and querying scheduled polls
- POLL - used to do an immediate poll, define the parameters thereof (ex. disk devices to use and whether to compress or not), or query certain information about the polling system.

### **Script file background**

Because the polling steps are defined internally within the polling code, it can be expensive (i.e. requires a patch) to add a new desired polling step once a load is released. Special scripts have been designed, used, and maintained to supplement the base polling data. Special demarcations within the script files allow the polling code to recognize, run, and collect the output of these scripts as part of the regular polling when the script is placed on NTDEV

### **1.2.2 New Feature Functionality**

The purpose of this feature is to allow the user the ability to modify the NTPOLL data collection template and address known software deficiencies. Currently, the poll steps performed during a polling are set in stone at initialization time and are not subject to changes, additions, or deletions of

steps by the craftsperson. To enhance the NTPOLL polling system, the following will be implemented:

- Creation of a new table, NTPOLL, which contains a visual representation of the poll steps to be done during the next polling, as well as the ability modify, add, or delete poll steps at the users discretion via Table Control.
- Consolidate existing polling scripts into the NTPOLL tool.
- A series of smaller, internal fixes within the polling code to improve the robustness and security of the polling system.

NOTE 1: This feature is being done in conjunction with feature “NTDEV POLLING DEVICE and FTP ACCESSIBILITY FROM SDM” (A00006219). The two features are independent and can stand alone, but the ability to FTP to NTDEV (where poll files are stored) is an enhancement to the overall polling functionality.

NOTE 2: It is suggested that access to Table NTPOLL be privclassed so that only certain administrative users may change it.

### 1.2.2.1 Table NTPOLL

This feature adds a new table to the system, Table NTPOLL.

This table can be used to view or customize the poll steps that will be taken the next time a polling occurs (NOTE: the “pollschd qsched” command can be used to query when the next polling is scheduled for).

Assuming there are n polling steps, when a polling begins, it will start at tuple 0 (zero), in Table NTPOLL, execute that step, and proceed through tuple n-1 to complete the polling.

Table NTPOLL is automatically datafilled with the default polling template by the system upon initialization. It reflects the internal data structures which track all of the poll steps to be taken.

Because the polling steps will now be stored in a DMS table instead of just in internal data structures, any changes made by the user to the polling steps will be preserved over system restarts and upgrades (ONP).

The following shows sample portions of Table NTPOLL (NOTE: initially there may be more than 430 steps in the table). The table’s keys are kept in order from 0 to n-1 (n=total # of poll steps), even if changes are made to the table (i.e. steps added or deleted).

The key contains the step number and an “insert bool”. The insert bool is only necessary when a new step is being added between existing steps. For example, if a new step is being added as step 33, the current step 33 becomes step 34, 34 becomes 35, 35 becomes 36, and so on.

The next four booleans determine whether or not that step is included in each of the four report types (LONG, SHORT, USAGE, and MEMCALC).

Finally, the step type and associated data are listed:

- CMPLX = complex step. A string name of the step is listed. A complex step involves a single or series of CI commands which are executed. Please see the explanation below of complex step fields for more information.
- TABLE = table step. The name of the table and the option whether to list out the table or count it is included. Please see the explanation below of table step fields for more information.

NTPOLLCI:

>list 50

TOP

NTPOLLKY

NTPDATA

```

-----
0 N      N Y N N CMPLX INT Display BCS Number
1 N      N Y N N CMPLX INT Display IMAGENAME
2 N      N Y N N CMPLX INT Display Log Message
3 N      N Y N N CMPLX INT CPID counts
4 N      N Y N N CMPLX INT PRSM List ACT Patches Turned On
5 N      N Y N N CMPLX INT PRSM List Act Patches
6 N      Y Y N N CMPLX INT PRSM INFORMLIST
7 N      Y N N N CMPLX INT PRSM INFORMSITE
8 N      Y N N N CMPLX INT PRSM INFORMLOAD
9 N      Y Y N Y CMPLX INT Dynamic Memory Size Information
10 N     Y Y N N CMPLX INT Display PM Loads
11 N     Y Y Y N CMPLX INT Display SOC Data

.
.
.
33 N     Y Y N N TABLE      OFCENG LIST ALL
34 N     Y Y N N TABLE      OFCOPT LIST ALL
35 N     Y Y N N TABLE      OFCSTD LIST ALL
36 N     Y Y N N TABLE      OFCVAR LIST ALL
37 N     N N N Y CMPLX INT Display MEMCALC Office Params
38 N     Y Y N Y TABLE      OFCAUT LIST ALL
39 N     Y Y N Y CMPLX INT Gathering Table Counts Header
40 N     Y N N N TABLE      ACDAGENTS COUNT
41 N     Y Y N N TABLE      ACSCRN1 COUNT
42 N     Y Y N Y TABLE      ACSCRN2 COUNT

```

### **Table NTPOLL fields**

Four types of tuples can be added to Table NTPOLL:

- Table step (COUNT) - counts the number of tuples in the table.
- Table step (LIST) - lists tuples in the table. There are several list options. Typically, a table step is simply to LIST ALL tuples in the table. However, options exist also to list the first or last n tuples in the table (ex. LIST FIRST 20 or LIST LAST 200).
- Complex step (INT) - an “internal” complex step. These are added to the table by the system and are not modifiable by the user (although they may be deleted). These complex steps execute a procedure internal to the code.
- Complex step (EXT) - an “external” complex step. These are defined by the user. the DMS command interface will attempt to execute, as a CI command, whatever string the user enters in the tuple.

The following fields are common to every tuple in Table NTPOLL:

NTPOLLKY - The key for Table NTPOLL. It is a two-part key:

- STEPNUM - The step number. The system will keep these numbered from 0 to n-1 (n = the total number of steps) whenever tuples are added or deleted.
- INSERT - This is a bool which is only used when a tuple is being inserted between two existing tuples. It should be set to ‘Y’ in that case, and ‘N’ any other time.

LONG - A bool which tells the system if this step is part of a long format polling report.

SHORT - A bool which tells the system if this step is part of a short format polling report.

USAGE - A bool which tells the system if this step is part of a usage format polling report.

MEMCALC - A bool which tells the system if this step is part of a memcalc format polling report.

STPTYP - The step type, either table or complex: {TABLE, CMPLX}

The following fields appear in the table based on the step type (STPTYP):

- **Table step fields**

TABNAME - The string name of the table

TSOPER - Table step operation - either list or count: {COUNT, LIST}



LISTOP - a LIST operation: {ALL, FIRST, LAST}

HOWMANY - If LISTOP is FIRST or LAST, this field will be prompted for and the number of tuples to be listed should be entered in this field

- **Complex step fields**

CMPLXTYP - An “internal” (code-defined) or “external” (user-defined) complex step: {INT, EXT}

CMPLXNAME - The string name of the complex step. For an internal complex step, this is just a name and the actual internal procedure which gets run is stored in internal data structures. For an external complex step, this string is actually run as if it was a CI command entered by the user.

NOTES on external complex steps: The maximum length string the user can enter is 40 characters. Also, because table control prompting only accepts everything up to the first space, the underscore, “\_”, should be used where spaces are desired. If a true underscore is desired, enter two consecutive underscores and the code will interpret this as an underscore rather than two spaces. For example, if “OPEN SWER” is the complex command the user wishes to be executed, “OPEN\_SWER” should be entered.

### **Table NTPOLL datafill examples**

Ex. 1 - Datafilling a “table count” step in Table NTPOLL

TABLE: NTPOLL

>

>add

MACHINES NOT IN SYNC - DMOS NOT ALLOWED

JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED

ENTER Y TO CONTINUE PROCESSING OR N TO QUIT

>y

NTPOLLKY:

>441 n

LONG: N

>y

SHORT: N

>y

USAGE: N

>

MEMCALC: N

>

STPTYP:

>table

TABNAME:

>MNATMIF

```
TSOPER:
>count
TUPLE TO BE ADDED:
  441 N      Y Y N N TABLE      MNATMIF COUNT
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>y
TUPLE ADDED
JOURNAL FILE INACTIVE
```

Ex. 2 - Datafilling a “table list all” step in Table NTPOLL

```
TABLE: NTPOLL
>
>add
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
NTPOLLKY:
>442 n
LONG: N
>y
SHORT: N
>
USAGE: N
>
MEMCALC: N
>
STPTYP:
>table
TABNAME:
>e911psap
TSOPER:
>list
LISTOP:
>all
TUPLE TO BE ADDED:
  442 N      Y N N N TABLE      E911PSAP LIST  ALL
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>y
TUPLE ADDED
JOURNAL FILE INACTIVE
```

Ex. 3 - Datafilling a “internal complex” step in Table NTPOLL

Internal complex commands are added by the system, but a “change” on a complex command tuple is below to show the different fields. For an internal complex command, the string name (CMPLXNAME) is merely a description of the command. The actual CI command(s) and/or procedure(s) to be run are stored internal to the code.

```
>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
LONG: N
>
SHORT: Y
>
USAGE: N
>
MEMCALC: N
>
STPTYP: CMPLX
>
CMPLXTYP: INT
>
CMPLXNAME: Display_IMAGENAME
>
TUPLE TO BE CHANGED:
      1 N          N Y N N CMPLX Display_IMAGENAME
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>n
DMO REJECTED
```

#### Ex. 4 - Datafilling a “external complex” step in Table NTPOLL

When a complex step is datafilled as EXT (external), the user is actually defining the exact CI command(s) which will run. The CMPLXNAME field will be run as a CI command at polling time. Note that due to table control prompting functionality, underscores must be used where spaces would normally be on the CI command line. Internally, the underscore will be converted to spaces. If a true underscore is desired in the CMPLXNAME, the user should enter a double underscore (i.e. two consecutive underscores).

The following example shows the addition of the “OPEN SWER” command to Table NTPOLL. This command is executed within the LOGUTIL CI level, so presumably the previous user-added step (step # 443) was an external complex command “LOGUTIL” to get into the LOGUTIL level so that OPEN SWER could be executed.

```
>add
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
NTPOLLKY:
>444 n
LONG: N
>y
SHORT: N
>
USAGE: N
>
MEMCALC: N
>
STPTYP:
>cmplx
CMPLXTYP:
>ext
CMPLXNAME:
>open_swer
TUPLE TO BE ADDED:
    444 N          Y N N N CMPLX    OPEN_SWER
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>y
TUPLE ADDED
JOURNAL FILE INACTIVE
```

Diagram 1 - NTPOLL fields.

**TABLE STEP TUPLES**

| <u>STEPNUM</u> | <u>LONG</u>  | <u>USAGE</u>   | <u>STPTYP</u>  | <u>TSOPER</u> | <u>HOWMANY</u> |       |          |       |       |     |
|----------------|--------------|----------------|----------------|---------------|----------------|-------|----------|-------|-------|-----|
| <u>INSERT</u>  | <u>SHORT</u> | <u>MEMCALC</u> | <u>TABNAME</u> | <u>LISTOP</u> |                |       |          |       |       |     |
| 33             | N            | Y              | Y              | N             | N              | TABLE | OFCENG   | LIST  | ALL   |     |
| 34             | N            | Y              | N              | N             | N              | TABLE | MNHSCARR | LIST  | LAST  | 400 |
| 35             | N            | Y              | N              | N             | N              | TABLE | HUNTMEM  | LIST  | FIRST | 20  |
| 36             | N            | Y              | Y              | Y             | Y              | TABLE | LNINV    | COUNT |       |     |

**COMPLEX STEP TUPLES**

| <u>STEPNUM</u> |   | <u>LONG</u>  |   | <u>USAGE</u>   |   | <u>STPTYP</u> | <u>CMPLXNAME</u> |                   |
|----------------|---|--------------|---|----------------|---|---------------|------------------|-------------------|
| <u>INSERT</u>  |   | <u>SHORT</u> |   | <u>MEMCALC</u> |   |               | <u>CMPLXTYP</u>  |                   |
| 33             | N | Y            | Y | N              | N | CMPLX         | INT              | Display_IMAGENAME |
| 34             | N | Y            | N | N              | N | CMPLX         | EXT              | OPEN_SWERR        |

**1.2.2.2 Consolidation of polling scripts into polling code**

An official set of polling script files currently exists. These script files augment the data collection template for each release. With this feature, the functionality of these official polling script files will be replaced by polling steps executed from within the internal polling code. Thus, the script files should no longer be necessary. However, the polling system will continue to look for polling scripts applicable to this load and release and if found, will execute the script. Care should be taken by script writers not to duplicate commands in the scripts which are already done by the internal code.

**1.2.2.3 Restore Default Steps**

A new option to the POLL CI command is added so that the user can return the state of the polling system to its system default. For example, if tuples are accidentally deleted from Table NTPOLL, the associated poll steps will no longer be executed during polling. The "POLL RESTORE\_DEFAULTS" command can be used to restore the list of polling steps (and thus Table NTPOLL) to the way it was at system initialization time.

The steps for restoring the polling defaults are:

The steps for restoring the polling defaults are:

(1) Delete all existing tuples from Table NTPOLL.

HINT: There are several ways to do this. If the “override” and “verify off” commands are available, the simplest way to do this would be the following:..

```
TABLE: NTPOLL
> count
BOTTOM
SIZE = 437
> ove;ver off
> repeat 437 (del;up)
```

With most tables, only the “del” part would be required. The “up” is included for this table because for every tuple delete, the tuples are renumbered. A repeat loop like this would only delete half of the tuples because the next tuple to be deleted actually gets moved up in the ordering, and the delete happens on the next tuple.

(2) Perform the POLL RESTORE\_DEFAULTS command.

```
>poll restore_defaults
Deleting any existing poll steps and recreating from defaults...
Done - default poll_steps restored.
```

#### 1.2.2.4 Execute a step in Table NTPOLL

A new option to the POLL CI command is added so that the user can execute a single step from Table NTPOLL. For example, using the sample NTPOLL table in section 1.2.2.1 “Table NTPOLL” on page 754, step number 33 (a “list all” on Table OFCENG) is executed:

```
> POLL DO_STEP 33
```

#### 1.2.2.5 Minor changes to default polling template

Several minor changes are made to the default polling template defined internally by the system.

- Existing steps that are not currently part of the LONG report are added to the LONG report. The LONG report is the mostly commonly gathered poll report, and certain steps that desired in the LONG report were only in the SHORT report in the past. The names of these steps are:

Display BCS Number  
Display IMAGENAME  
Display Log Message  
DMSMON - LOGCOUNT,  
DMSMON - RESTARTINFO,  
DMSMON - PMCONFIG,  
DMSMON - PMLOADS,  
DMSMON - ASSESS,  
Display CM/MS IDPROM

The output of all of these commands is relatively short and should not increase the length of the LONG report by much.

- The “SOC DBAUDIT” command is added to the complex step that gathers various SOC information (the “Display SOC Data” complex step).
- The processor type the polling is running on is queried so that only commands applicable to that processor type (ex. 88k vs. XA-Core) will be executed.

#### 1.2.2.6 NTPOLL Robustness

While mostly invisible to the user, a number of internal robustness fixes have gone into the polling code for SN08. Among them are:

- A security fix for the POLLUSER remaining permitted after the polling. Each time a scheduled polling occurs, a new DMS user called POLLUSER is permitted to the system, is logged in, and the work of the polling is done under this login session. Problems in the field have been seen where POLLUSER is not properly unpermitted after the polling. A new fix that has gone into the TL21 stream addresses this and ensures the POLLUSER is unpermitted after polling occurs.
- The file compression algorithm will be changed so as to avoid disk space issues on NTDEV. For example, suppose that there is enough data on the switch that a polling has created three data files, POLLDATA, POLLDATA1, and POLLDATA2 and that the compression option was chosen when the polling was scheduled. Currently, the system will create the three files and then compress all three after the polling is done. Under the new algorithm, each file will be automatically compressed as soon as it is closed. This will allow more space for new files to be created and guard against running out of disk space.
- An issue has been discovered where a polling may prematurely halt under certain conditions when one of the poll data files reaches its maximum line limit (approx. 30,000 lines). Rather than close the file and create a new poll data file (as is normally the case), the polling simply stops. Safeguards will

be put in the code to monitor for this condition and properly close the file and create a new one in order to allow the polling to continue.

#### 1.2.2.7 “Push” poll data files to a network location (future)

**IMPORTANT NOTE: The POLL PUSH functionality was not implemented. The description is left here for reference as part of a potential future feature, but this functionality is not available at this time.**

A desired functionality of the polling system is for the code to automatically FTP the poll data files to a pre-specified network location once a polling has completed. The PUSH option is added to the POLL command. By default, poll pushing is OFF, but it may be turned on and configured with the IP address, userid, password, and remote directory that FTP would need to properly store the files at the remote location.

Ex. Turn automatic file pushing off.

```
> POLL PUSH OFF
```

Ex. Turn automatic file pushing on.

The format is:

```
POLL PUSH ON <ip_addr> <remote_userid> <passwd> <directory>
```

```
> POLL PUSH ON 47.142.211.3 myuserid mypasswd  
/home/poll dude/poll data
```

Entering valid parameters for the POLL PUSH command is entirely up to the user. The polling system will do no error checking on the parameters and if any of them are invalid, the FTP storing of the files on the remote system will simply fail.

### 1.3 Hardware Requirements or Dependencies

No new dependencies.

### 1.4 Software Requirements or Dependencies

This feature is being developed for SN08 (built on CSP21, which contains TL21 and BAS22).

### 1.5 Limitations and restrictions

N/A

### 1.6 Interactions

N/A



## 1.7 Glossary

| Term     | Description                                                                                                                            |
|----------|----------------------------------------------------------------------------------------------------------------------------------------|
| DMS      | Digital Multiplexing System                                                                                                            |
| FTP      | File Transfer Protocol                                                                                                                 |
| NTDEV    | Nortel device (memory resident disk device)                                                                                            |
| NTPOLL   | DMS polling system which gathers various information about the switch and stores results in POLLDATA files. Pollings can be scheduled. |
| POLL     | CI command to do a polling or query polling parameters                                                                                 |
| POLLSCHD | CI command to schedule a polling or query poll schedule parameters                                                                     |

### *Configuration for A00006226*

## 1.8 Hardware and Software Requirements

## 1.9 Initial Configuration

## 1.10 Office/Subnet parameters (OP/SP) (CM & SESM)

## 1.11 Upgrade Considerations

## 1.12 Data schema (DS) (CM, MIBS, RDB)

### 1.12.1 New/modified tables, MIBs, or Database Schema

Table 2 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------|--------------------------|------------------------------------|
| NTPOLL         | New                      | New                                |

### 1.12.2 Table/MIB/Remote Database Schema information

#### 1.12.2.1 Name: NTPOLL

##### 1.12.2.1.1 Functional description

Table NTPOLL is a new table which contains the steps (one per tuple) taken by the DMS polling system (administered by the POLL and POLLSCHD CI

commands). This type of polling is existing functionality which gathers various information about the switch and stores the results in output files on either SFDEV or NTDEV. Previously, the user could not add, delete, or manipulate the polling steps as they were defined internally by the system at initialization time. This table allows the user that flexibility. Initially, the polling steps are still defined by the system. These system defined steps will be automatically entered into Table NTPOLL by the system. After that, the user is free to add, delete, or manipulate the polling steps. The system defines over 430 polling steps, so initially Table NTPOLL will have that many tuples.

#### 1.12.2.1.2 Usage sequence and implications (CM Only)

Table NTPOLL has no dependencies on other tables.

#### 1.12.2.1.3 Size

**Table 3 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                           |
|------------------------|----------------|----------------|-------------------------------------------------|
|                        |                |                |                                                 |
| NTPOLL                 | 0              | 1023           | SEGSTOR and FREEMAPS are used to manage memory. |

#### 1.12.2.1.4 Fields/OIDs

The following table lists fields/OIDs for Table NTPOLL.

The following fields exist in all tuples.

**Table 4 Table field descriptions**

| Field   | New or Changed | Subfield or refinement | Entry     | Explanation and action                                                                                                                                                                                                        |
|---------|----------------|------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STEPNUM | new            | n/a                    | {0..1023} | Step number. With the INSERT field, this is part of the key for the table. If there are n polling steps, STEPNUM will range from 0 to n-1. The step numbers in the table will be kept in order and consecutive by the system. |

**Table 4 Table field descriptions**

| <b>Field</b> | <b>New or Changed</b> | <b>Subfield or refinement</b>                                     | <b>Entry</b>   | <b>Explanation and action</b>                                                                                                                                                        |
|--------------|-----------------------|-------------------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| INSERT       | new                   | n/a                                                               | {N, Y}         | This bool is only meaningful and should only be set to Yes if the user wishes to add a new tuple between two existing tuples.                                                        |
| LONG         | new                   | n/a                                                               | {N, Y}         | A bool which tells the system if this step is part of a long format polling report.                                                                                                  |
| SHORT        | new                   | n/a                                                               | {N, Y}         | A bool which tells the system if this step is part of a short format polling report.                                                                                                 |
| USAGE        | new                   | n/a                                                               | {N, Y}         | A bool which tells the system if this step is part of a usage format polling report.                                                                                                 |
| MEMCALC      | new                   | n/a                                                               | {N, Y}         | A bool which tells the system if this step is part of a memcalc format polling report.                                                                                               |
| STPTYP       | new                   | This field has a refinement for TABLE and a refinement for CMPLX. | {TABLE, CMPLX} | The step type, either table or complex. Table steps gather information from other DMS tables. Complex steps gather information from the switch by executing one or more CI commands. |

The following fields apply when STPTYP=TABLE.

| <b>Field</b> | <b>New or Changed</b> | <b>Subfield or refinement</b> | <b>Entry</b>          | <b>Explanation and action</b>                         |
|--------------|-----------------------|-------------------------------|-----------------------|-------------------------------------------------------|
| TABNAME      | new                   | n/a                           | String (1 to 8 chars) | The name of the DMS table to gather information from. |

| Field  | New or Changed | Subfield or refinement      | Entry         | Explanation and action                                                                                     |
|--------|----------------|-----------------------------|---------------|------------------------------------------------------------------------------------------------------------|
| TSOPER | new            | Refinement if TSOPER = LIST | {COUNT, LIST} | Denotes whether to list tuples from, or count the tuples of the table denoted stored in the TABNAME field. |

IF TSOPER = LIST

| Field  | New or Changed | Subfield or refinement               | Entry              | Explanation and action                                                                                                             |
|--------|----------------|--------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------|
| LISTOP | new            | Refinement if LISTOP = FIRST or LAST | {ALL, FIRST, LAST} | Determines whether all the tuples should be listed, or the FIRST or LAST n tuples (if FIRST or LAST, see the next field, HOWMANY). |

IF LISTOP = FIRST or LISTOP = LAST

| Field   | New or Changed | Subfield or refinement | Entry        | Explanation and action                                                                                                                                                                     |
|---------|----------------|------------------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HOWMANY | new            | n/a                    | unsigned INT | The number of tuples to be listed from the table should be entered here. If LISTOP = FIRST, the first HOWMANY tuples are listed, and if LISTOP = LAST, the last HOWMANY tuples are listed. |

The following fields apply when STPTYP = CMPLX.

| Field     | New or Changed | Subfield or refinement | Entry                  | Explanation and action                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|----------------|------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CMPLXTYP  | new            | n/a                    | {INT, EXT}             | INT denotes an “internal” complex step. These tuples can ONLY be datafilled by the system and not by the user. EXT denotes an “external” complex step, i.e. one that is defined by the user. When an internal complex step is executed, an internal procedure in the code is run. When an external complex step is executed, the exact string in the CMPLXNAME field is executed as if it was a CI command typed by the user. |
| CMPLXNAME | new            | n/a                    | String (1 to 40 chars) | This string denotes the name of the complex step. In the case of an internal complex step, it is merely a name denoting the step. In the case of an external complex step, it is the actual command that will run at polling time.                                                                                                                                                                                            |

#### 1.12.2.1.5 Datafill example

The following example shows sample datafill for table NTPOLL.

The following example shows about 20 sample tuples from Table NTPOLL. Four types of tuples are shown:

- Table step (list)
- Table step (count)
- Complex step (internal)
- Complex step (external)

## NOTES:

(1) Note that in the CMXPLXNAME field (i.e. the string associated with complex steps), spaces are represented as underscores. Internally, these underscores are converted to spaces but since space is the field separator in table control, this is necessary to keep the whole CMPLXNAME in one field.

(2) The system keeps the steps in order and consecutive. If there are n steps in the polling, the table keys will always be numbered 0 to n-1.

25 N N Y N N CMPLX INT DMSMON\_-\_PMLOADS

26 N N Y N N CMPLX INT DMSMON\_-\_ASSESS

27 N Y Y N N CMPLX INT DMSMON\_-\_HIGHPARMS

28 N Y Y N N CMPLX INT DMSMON\_-\_HIGHCAP

29 N Y Y N N CMPLX INT DMSMON\_-\_MEMORY

30 N Y Y N N CMPLX INT DMSMON\_-\_DBLOCKS

31 N Y Y Y Y CMPLX INT Exit\_DMSMON

32 N Y Y N N CMPLX INT Display\_Office\_Parms\_Header

33 N Y Y N N TABLE OFCENG LIST ALL

34 N Y Y N N TABLE OFCOPT LIST ALL

35 N Y Y N N TABLE OFCSTD LIST ALL

36 N Y Y N N TABLE OFCVAR LIST ALL

37 N N N N Y CMPLX INT Display\_MEMCALC\_Office\_Parms

38 N Y Y N Y TABLE OFCAUT LIST ALL

39 N Y Y N Y CMPLX INT Gathering\_Table\_Counts\_Header

40 N Y Y N Y CMPLX EXT LOGUTIL

41 N Y Y N Y CMPLX EXT OPEN\_SWER

42 N Y Y N Y CMPLX EXT QUIT

43 N Y N N Y TABLE EDRA MINV COUNT

44 N Y N N N TABLE E911PSAP COUNT

#### **1.12.2.1.6 Table release history update**

This is a new table in SN08/CSP21.

#### **1.12.2.1.7 Supplementary information**

N/A

#### **1.12.2.1.8 Translation verification and other tools**

N/A

### **1.13 Service Orders (SO) (CM & SESM)**

### **1.14 Software optionality control (SOC)**

### **1.15 Element Management**

### **1.16 User interface changes**

### **1.17 OSSGate Interface Changes**

### **1.18 Security**

### **1.19 Configuration Walkthrough**

***Product = CS 2000***

## **A00006269--OSSGate Password No Echo**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP

#### **1.2 Description**

This document details the OSSGate login changes. It describes the changes being made to OSSGate application which is part of CS2K Management Tools (CMT).

This feature is introduced to make OSSGate consistent with other user interfaces in the CS2K Configuration Management System.

This feature provides the following new or amended functionality:

- No echo of password to the screen when logging in to OSSGate using telnet client
- Ability to turn on or off this functionality using SESM configuration option
- Change to BPT tool to support either login modes

An important change to point out as a consequence of this feature is that OSS vendor software will be impacted by this change. In order to get existing OSS software to work when this new functionality is turned on by SESM configuration, there are couple of changes which need to be implemented in the OSS software. The following are the changes, only if OSSGate Password Control option is turned on (default: off).

- recognize the new login prompt. Prior to SN07, the user name and password was prompted in the same line separated by space. Now, the username and password are prompted one after the other
- OSSGate sends telnet protocol bytes to client to tell it to turn off echo and turn on echo. This is needed for telnet client software. OSS vendor software just needs to ignore these bytes.

### 1.3 Hardware Requirements or Dependencies

N/A

### 1.4 Software Requirements or Dependencies

N/A

### 1.5 Limitations and restrictions

N/A

### 1.6 Interactions

N/A

### 1.7 Applicable customer facing sections

Fault Management

Logs

Alarms

Configuration



|                                                 |        |
|-------------------------------------------------|--------|
| Upgrade                                         | ___X__ |
| Data Schema                                     | _____  |
| Service Order                                   | _____  |
| Element Management                              | _____  |
| User Interface                                  | ___X__ |
| Accounting (includes AMA billing)               | _____  |
| Performance (includes operational measurements) | _____  |

## 1.8 Glossary

| Acronym     | Definition                          |
|-------------|-------------------------------------|
| <b>BLM</b>  | Business Line Management            |
| <b>CLLI</b> | Common Language Location Identifier |
| <b>CM</b>   | Computing Module                    |
| <b>CMT</b>  | Call Server 2000 Management Tools   |
| <b>CPE</b>  | Customer Premises Equipment         |
| <b>CS</b>   | Call Server                         |
| <b>CS2K</b> | Call Server 2000                    |
| <b>DDMS</b> | DMS Data Management System          |
| <b>DMS</b>  | Digital Multiplex System            |
| <b>GPS</b>  | Global Product Support              |
| <b>GUI</b>  | Graphical User Interface            |
| <b>HLD</b>  | High Level Design                   |
| <b>HTML</b> | HyperText Markup Language           |
| <b>IP</b>   | Internet Protocol                   |
| <b>ITA</b>  | Internet Transparency Agent         |
| <b>LAN</b>  | Local Area Network                  |
| <b>MI2</b>  | Manatee Iteration II                |
| <b>MTC</b>  | Maintenance                         |

|                  |                                                          |
|------------------|----------------------------------------------------------|
| <b>NA</b>        | North American                                           |
| <b>OAM&amp;P</b> | Operations, Administration, Maintenance and Provisioning |
| <b>OSS</b>       | Operation Support System                                 |
| <b>OSSDI</b>     | OSS Data Interface                                       |
| <b>PLM</b>       | Product Line Management                                  |
| <b>PTM</b>       | Packet Telephony Manager                                 |
| <b>SDM</b>       | SuperNode Data Manager                                   |
| <b>SESM</b>      | Succession Element and Sub-Element Manager [system]      |
| <b>SSPFS</b>     | Succession Solaris Platform Foundation Software          |
| <b>TCP</b>       | Transmission Control Protocol                            |
| <b>TDM</b>       | Time Division Multiplexing                               |

## ***Configuration for A00006269***

### **2.1 Upgrade Impact**

This activity is responsible for handling modifications to OSSGate login. By default the OSSGate login functionality will be same as in SN07 and to turn on the new functionality, the user has to manually turn on an option via SESM configuration.

Prior to the SN07 release, login to the OSSGate involved entering username and password in one line separated by space, and the password entered was visible on the telnet window. In SN08, the user has to manually configure to turn on the OSSGate Password Control option in the SESM's OSSGate configuration section. Once this option is turned on, when attempting to login to OSSGate, it will prompt for the username first and then the password and the password being entered will not be displayed to the screen.

The default value of this OSSGate Password Control option is off, meaning the OSSGate login will be similar to SN07. This is done to minimize the impact to OSS operations, since the new login prompts of OSSGate will require changes in OSS vendor software. With this approach, it gives the customer the flexibility to turn on OSSGate password control option, when they are ready with changes to OSS vendor software. There is no impact after upgrades other than this OSSGate Password Control option is now available in SESM's OSSGate configuration section and the user can turn it on (default is off).

## 2.2 Data schema (DS) (CM, MIBS, RDB)

N/A

## 2.3 Service Orders (SO) (CM & SESM)

N/A

## 2.4 Element Management

N/A

## 2.5 User Interface

### 2.5.1 OSSGate Login prompt changes

This section shows the new login prompt prompted by OSSGate. The other functionality of OSSGate does not change except for the login prompt changes.

The user has to manually turn on the OSSGate Password Control option in order for this login change to take affect, as it is turned off by default.

Shown below is the screen capture of logging into OSSGate from SESM box. (user input is shown in blue). The new login prompts are shown in red.

```
#telnet localhost 10023
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
```

Enter User Name

> ptm

Enter Password

>

ptm logged in on 04/04/16 at 09:02:40.

```
*****
**                                     **
**      OSS Gateway                    **
**                                     **
**      This is a PRIVATE Database.    **
**                                     **
**      All activity is subject to monitoring.  **
**                                     **
**      Any UNAUTHORIZED access or use is PROHIBITED  **
**      and may result in PROSECUTION.          **
**                                     **
*****
```

```
** WARNING : Different service types require      **
** different formats. Consult the OSSGate User's  **
** Guide, NE1004-512, for detailed information    **
** regarding command formats and usage rules.     **
** Failure to do so can cause a mismatch between  **
** XACore and SESM data.                          **
*****
```

SN07 Build: Apr 13, 2004 7:28:37 PM

```
*****
```

>

## 2.5.2 OSSGate configuration

In this section, the screen output below shows the new OSSGate Password Control option which needs to be turned on to enable OSSGate to not echo password to the screen. The new configuration option is available in SESM's OSSGate configuration section and is shown in **red**. The user input is shown in **blue**.

After logging into the SESM box as root,

```
#cd /opt/nortel/NTsesm/admin/bin
```

```
#./configure
```

SESM configuration

- 1 - SESM common configuration (IP addresses, Market, CM CLI)
- 2 - SESM database tools
- 3 - SESM related applications configuration (MG9K, LMM, CICM)
- 4 - SESM provisioning configuration
- 5 - SESM logging configuration (syslog, sesm debug log)
- 6 - view sesm configuration settings
- 7 - SESM refresh properties

X - exit

select - 4

SESM Provisioning Configuration

- 1 - XML Trunk Provisioning configuration
- 2 - OSSGate Provisioning configuration
- 3 - Office Provisioning Type configuration

X - exit

select - 2

## SESM OSSGate Provisioning Configuration

Enter the Primary Port OSSGate will use for telnet connections (default: 10023):

Enter the Secondary Port OSSGate will use for telnet connections (default: 11023):

Enter the OSSGate Timeout period, in seconds (default: 600):

Do you wish to have OSSGate Port Forwarding on for SSH [y/n]: n

Do you wish to turn on/off OSSGate Password Control option  
( when this option is turned on, OSSGate will not echo  
password on screen when logging onto it) [default: off] : on

Updating the property files with changed values, please wait...

Reloading the changed property values into memory, please wait...

### 2.5.3 Login prompt change implications

Prior to the SN08 release, the user name and password was prompted in the same line. In this release, however, there are two main changes which impact clients of OSSGate. They are

1. Instead of looking for login prompt “Enter username and password”, clients should look for “Enter User Name” prompt from OSSGate first. Once it gets this, the user name should be sent to OSSGate. Ossgate will then send “Enter Password” prompt. After receiving this prompt, the password should be sent to OSSGate.
2. OSSGate sends telnet echo off byte sequence to clients (to tell telnet clients to not display password entered onto screen) after sending the “Enter Password” prompt. This echo off byte sequence is necessary to make telnet client software not echo a password typed on screen.

#### 2.5.3.1 Impact to BPT tool

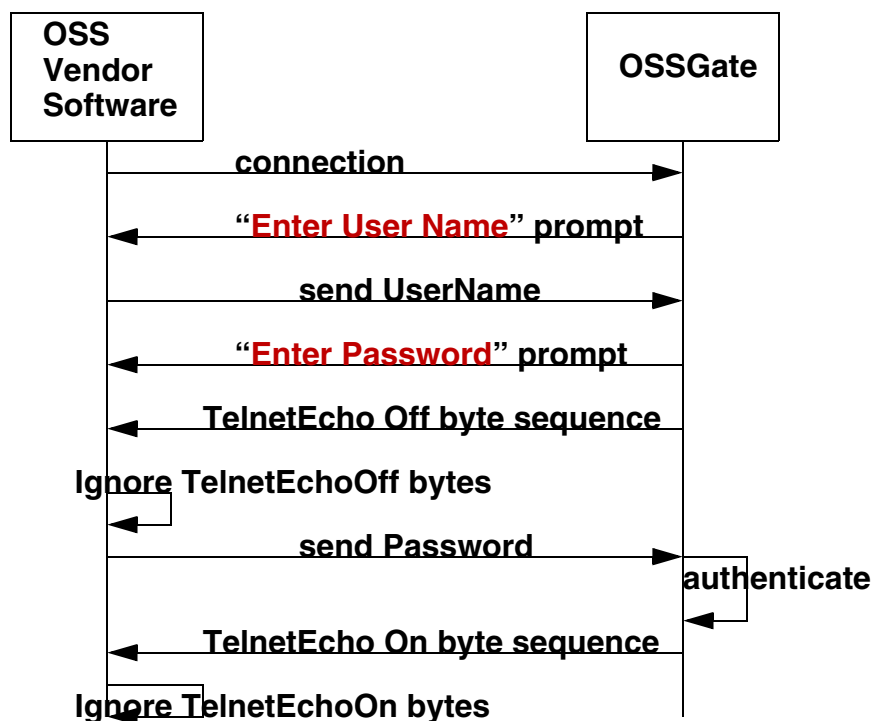
There are no external interface changes to BPT. Internally, BPT tool will handle the different prompts and will also strip telnet bytes and ignore them. But for users of BPT tool, there are no changes in the interface.

#### 2.5.3.2 Impact to OSS vendor software

OSS software should be able to handle the new login prompts and also detect telnet bytes and strip these bytes and ignore them.

Shown in the Figure 1 below are the changes needed to be done to OSS vendor software to interact with OSSGate when the OSSGate password control option is enabled.

**Figure 1** OSS Vendor software and its interaction with OSSGate



In the above figure, the new prompts are shown in dark red. The telnet bytes sent are explained below.

The Telnet Echo Off byte sequence are 3 bytes shown below

#### IAC WILL ECHO

IAC byte value is 255  
WILL byte value is 251  
ECHO byte value is 1

OSS software should look for these bytes and when received, just ignore them

The Telnet Echo On byte sequence are 3 bytes shown below

#### IAC WONT ECHO

IAC byte value is 255  
WONT byte value is 252

ECHO byte value is 1

***Product = CS 2000***

## **A00006271--CEPT Act/Deact and Interrogation for ETSI BRI CFK, CFB/CFD K**

### ***Functional Description***

#### **2.1 Applicable Solution(s)**

DMS

#### **2.2 Description**

##### **2.2.1 Background**

Activation, deactivation and interrogation of CFB (Call Forwarding Busy), CFD (Call Forwarding Don't Answer) and CFU (Call Forwarding Unconditional) features based on the CEPT Dialing Sequence has been already implemented per loop (or a chosen DN keylist) (for more information, please refer to [1] (A59034125 "ISDN BRI CEPT Call Forwarding" in PLS FMDOC).

CFx and CFx per Key are administration assigned features but the subscriber as well as the administrator has the ability of activating, deactivating and interrogating the feature.

This activity is only interested in the activation, deactivation and interrogation of the previously assigned CFx per Key option based on CEPT Dialing Sequence and neither interested in the provisioning of the CFx per Key option nor the existing CFx per Key activation, deactivation and interrogation code (for more information, please refer to [2] A59028702 "Support of CFx for Multiple DNs for ETSI BRI" in PLS FMDOC).

##### **2.2.1.1 Existing CFB and CFD Types**

There are 4 types of CFB and CFD:

- N (Normal) - "Forwarded to DN" is specified during assignment of feature, and forwarding capability is immediately activated and remains activated.
- F (Fixed) - "Forwarded to DN" is specified during assignment of feature, but forwarding capability is activated and deactivated by the user from the set to which the feature is assigned.

- P (Programmable) - Similar to F type, but upon activation, user from set also specifies forwarded to DN. No “Forwarded to DN” is specified during assignment of the feature.
- K (Programmable per Key) - For every DN in the KEYLIST, a new tuple is created in table CFX (for the other types of CFB and CFD, a common tuple is created for all the DNs in the keylist). This means that each DN might have its own data.

The CFB and CFD call forwarding features are assignable only to KEY 1 of an ISDN BRI set. Those DN Keys which receive the functionality of such an assignment are specified in a KEYLIST.

### 2.2.1.2 Existing CFK Feature

The CFK (Call Forwarding per Key) feature can be assigned to KEY 1 or to any vacant key on a set. Again, those DN Keys which receive the functionality of such an assignment are specified in a KEYLIST. For CFK, the user can program a separate “Forwarded to DN” to each key specified in the KEYLIST.

This activity is only interested in CFK option and the K (Programmable per Key) type of the CFB and CFD options.

### 2.2.2 Feature Overview

This document describes the Functional Description of the ETSI BRI activity A00006271 “CEPT Act/Deact and Interrogation for ETSI BRI CFK, CFB/CFD K” in ISN08.

This feature is needed to make available the activation, deactivation and interrogation of CFB per Key (Call Forwarding Busy per Key), CFD per Key (Call Forwarding Don't Answer per Key) and CFK (Call Forwarding Unconditional per Key) features based on the CEPT Dialing Sequence.

In this document, CFD is used instead of ETSI CFD or CFNR (Call Forwarding No Reply). With the existing implementation, CFD is used in Servord and in provisioning tables, and CFNR is invisible to the crafts person. Therefore, only CFD is used in this document to mean CFNR.

In this document, “MSN A” is used to define the DN which is assigned to ISDN BRI set or IBN set by configuring the TA's (Terminal Adaptor) port as the first DN by subscriber and can be different from the primary DN (Key 1) provisioned at the exchange.

The following abbreviations are used in describing the activation, deactivation and interrogation control procedures of ETSI BRI CFX per Key in CEPT Dialing Sequence:



LH: Lift Handset, RH: Replace on Hook, DT: Dial Tone, ACK: Acknowledge Tone, NACK: Negative ACKnowledge Tone, AC: Access Code, DN: Directory Number, \*: Dialing Star, #: Dialing Octothorpe.

According to Turk Telecom tender, the feature CFx per Key is enhanced to function on ETSI BRI lines by using CEPT Dialing Sequence.

Although, subscriber can activate and deactivate a CFx per Key option by using ISDN BRI Set's menu options and keys (for more information, please refer to [2] A59028702 "Support of CFx for Multiple DNs for ETSI BRI" in PLS FMDOC), if there is an "Analog Telephone" on the loop which is connected to the ISDN loop over TA (Terminal Adaptor), user has no chance to use menu options and keys. So, this activity supplies CEPT dialing ability to the "Analog Telephone" user which is connected to the ISDN loop over TA (and also to the ISDN BRI user) to activate, deactivate and interrogate a CFx per Key option.

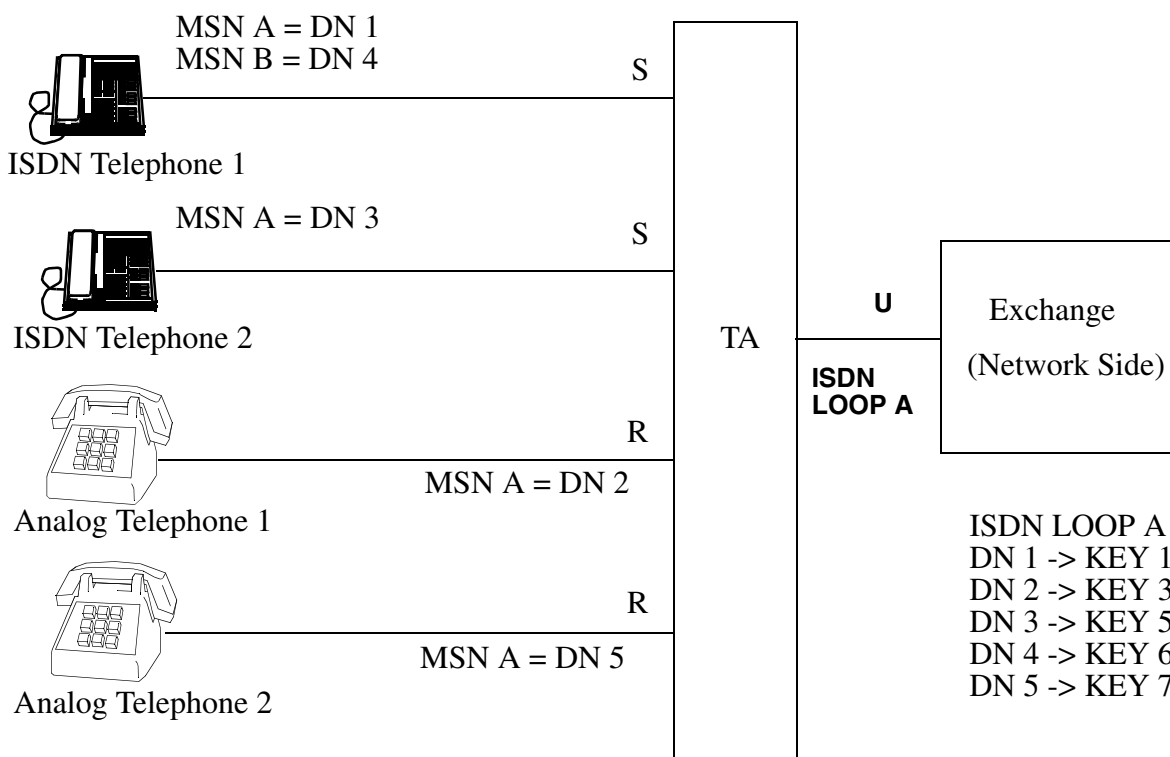
While explaining the desired behavior, refer to the example configuration in Figure. It is supposed that DN1, DN2, DN3, DN4 and DN5 of the "ISDN loop A" have CFx per Key options. If a subscriber has the configuration like Figure 1, subscriber might:

- d. Activate, deactivate or interrogate the CFx per Key option assigned to DN 1 by using "ISDN Telephone 1" (subscriber might activate, deactivate or interrogate a CFx per Key option assigned to DN of the MSN A of the ISDN BRI terminal which is used to dial CEPT sequence).
- e. Activate, deactivate or interrogate the CFx per Key option assigned to DN 4 by using "ISDN Telephone 1" (subscriber might activate, deactivate or interrogate a CFx per Key option assigned to DN of the MSN X (an MSN of the ISDN BRI set different than MSN A) of the ISDN BRI terminal which is used to dial CEPT sequence).
- f. Activate, deactivate or interrogate the CFx per Key option assigned to DN 3 by using "ISDN Telephone 1" (subscriber might activate, deactivate or interrogate a CFx per Key option assigned to DN of the MSN A of the other ISDN BRI terminal on the same ISDN loop).
- g. Activate, deactivate or interrogate the CFx per Key option assigned to DN 2 by using "Analog Telephone 1" (subscriber might activate, deactivate or interrogate a CFx per Key option assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA).
- h. Activate, deactivate or interrogate the CFx per Key option assigned to DN 5 by using "Analog Telephone 1" (subscriber might activate, deactivate or interrogate a CFx per Key option assigned to DN of the MSN A of the other Analog Telephone on the same ISDN loop by

dialing from another Analog Telephone on the same loop which is connected to the ISDN loop over a TA).

- i. Activate, deactivate or interrogate the CFx per Key option assigned to DN 3 by using “Analog Telephone 1” (subscriber might activate, deactivate or interrogate a CFx per Key option assigned to DN of the MSN A of an ISDN BRI terminal on the same ISDN loop by dialing from an Analog Telephone on the same loop which is connected to the ISDN loop over a TA).

**Figure 2 Sample Configuration of an ISDN loop**



TA : Terminal Adaptor

### 2.2.2.1 Activating CFx per Key Option

- If subscriber wants to activate:  
a CFx per Key option assigned to DN of the MSN A of the ISDN BRI terminal which is used to dial CEPT sequence (item “a” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA (item “d” of Section 1.3.2);

#### **LH DT \* AC \* Forwarded to DN # ACK RH**

The ETSI BRI Call Forward per Key option becomes active immediately after execution of this sequence. DN entered must be a translatable number, that means “Forwarded to DN” is validated.

Any incomplete activation sequence will result in NACK:

#### **LH DT \* AC \* invalid-dialing-sequence NACK RH**

The implementation of this behavior for the CFB per Key and CFD per Key options is already available in the existing code (if CFB per Key or CFD per Key options are assigned to MSN A of an ISDN BRI terminal which is used to dial CEPT sequence or assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA, it already works). **This activity only implements this functionality for the CFK option.**

- If subscriber wants to activate,  
a CFx per Key option assigned to DN of the MSN X (an MSN of a terminal different than MSN A) of that terminal which is used to dial CEPT sequence (item “b” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of the other ISDN BRI terminal on the same ISDN loop (item “c” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of an Analog Telephone on the same ISDN loop by dialing from another Analog Telephone on the same loop which is connected to the ISDN loop over a TA (item “e” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of an ISDN BRI terminal on the same ISDN loop by dialing from an Analog Telephone on the same loop which is connected to the ISDN loop over a TA (item “f” of Section 1.3.2);

**LH DT \* AC \* Forwarded to DN \* DN of MSN X # ACK RH**

The ETSI BRI Call Forward per Key option becomes active immediately after execution of this sequence. DN entered must be translatable number, that means Call Forwarded to DN is validated.

Any incomplete activation sequence will result in NACK:

**LH DT \* AC \* invalid-dialing-sequence NACK RH****2.2.2.2 Deactivating CFx per Key Option**

- If subscriber wants to deactivate;  
a CFx per Key option assigned to DN of the MSN A of the ISDN BRI terminal which is used to dial CEPT sequence (item “a” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA (item “d” of Section 1.3.2);

**LH DT # AC # ACK RH**

The ETSI BRI Call Forward per Key option becomes inactive immediately after execution of this sequence.

The implementation of this behavior for the CFB per Key and CFD per Key options are already available in the existing code (if CFB per Key or CFD per Key options are assigned to MSN A of an ISDN BRI terminal which is used to dial CEPT sequence or assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA, it already works). **This activity only implements this functionality for the CFK option.**

- If subscriber wants to deactivate;  
a CFx per Key option assigned to DN of the MSN X (an MSN of a terminal different than MSN A) of that terminal which is used to dial CEPT sequence (item “b” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of the other ISDN BRI terminal on the same ISDN loop (items “c” of Section 1.3.2),  
or  
a CFx per Key option assigned to DN of the MSN A of an Analog Telephone on the same ISDN loop by dialing from another Analog Telephone on the same loop which is connected to the ISDN loop over a TA (item “e” of Section 1.3.2),

or

a CFx per Key option assigned to DN of the MSN A of an ISDN BRI terminal on the same ISDN loop by dialing from an Analog Telephone on the same loop which is connected to the ISDN loop over a TA (item “f” of Section 1.3.2);

**LH DT # AC \* DN of MSN X # ACK RH**

The ETSI BRI Call Forward per Key option becomes active immediately after execution of this sequence.

Any incomplete activation sequence will result in NACK:

**LH DT \* AC \* invalid-dialing-sequence NACK RH**

### 2.2.2.3 Interrogating CFx per Key Option

- If subscriber wants to interrogate a “Forwarded to DN” of;  
a CFx per Key option assigned to DN of the MSN A of the ISDN BRI terminal which is used to dial CEPT sequence (item “a” of Section 1.3.2),

or

a CFx per Key option assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA (item “d” of Section 1.3.2);

if DN is equivalent to the DN stored,

**LH DT \*# AC \* Forwarded to DN # ACK RH**

if DN stored does not match the DN entered

**LH DT \*# AC \* Forwarded to DN # NACK RH**

The implementation of this behavior for the CFB per Key and CFD per Key options are already available in the existing code (if CFB per Key or CFD per Key options are assigned to MSN A of an ISDN BRI terminal which is used to dial CEPT sequence or assigned to DN of the MSN A of an Analog Telephone by dialing from that Analog Telephone which is connected to the ISDN loop over a TA, it already works). **This activity only implements this functionality for the CFK option.**

- If subscriber wants to interrogate a “Forwarded to DN” of;  
a CFx per Key option assigned to DN of the MSN X (an MSN of a terminal different than MSN A) of that terminal which is used to dial CEPT sequence (item “b” of Section 1.3.2),

or

a CFx per Key option assigned to DN of the MSN A of the other ISDN BRI terminal on the same ISDN loop (item “c” of Section 1.3.2),

or

a CFx per Key option assigned to DN of the MSN A of an Analog Telephone on the same ISDN loop by dialing from another Analog Telephone on the same loop which is connected to the ISDN loop over a TA (item “e” of Section 1.3.2),

or

a CFx per Key option assigned to DN of the MSN A of an ISDN BRI terminal on the same ISDN loop by dialing from an Analog Telephone on the same loop which is connected to the ISDN loop over a TA (item “f” of Section 1.3.2);

if DN is equivalent to the DN stored,

**LH DT \*# AC \* Forwarded to DN \* DN of MSN X # ACK RH**

if DN stored does not match the DN entered

**LH DT \*# AC \* Forwarded to DN \* DN of MSN X # NACK RH**

## 2.3 Hardware Requirements or Dependencies

N/A

## 2.4 Software Requirements or Dependencies

N/A

## 2.5 Limitations and restrictions

- Maximum number of digits for Forwarded-to-DN is 30.
- Restrictions for the maximum number of digits for DN-of-MSN<sub>X</sub> are as follows:
  - i. SNPA + OFC CODE + STN CODE ≤ 15
  - ii. OFC CODE + STN CODE ≤ 14
  - iii. STN CODE ≤ 8
  - iv. OFC CODE ≤ 7
- If dialed Forwarded-to-DN contains a DN which is available at the same office as the subscriber and if subscriber dials extra digits after the valid Forwarded-to-DN by following the restriction of the maximum number of digits for Forwarded-to-DN, extra digits are removed and the rest of the translatable digits are stored as Forwarded-to-DN.
- Since DN-of-MSN<sub>X</sub> must be a DN which is available ISDN loop of the subscriber (at the same office), if subscriber dials extra digits after the valid DN-of-MSN<sub>X</sub> by following the restriction of the maximum number of digits for DN-of-MSN<sub>X</sub>, it is acceptable.
- This activity is not supported for the Centrex offices.

- CEPT Act/Deact and Interrogation are not supported via Keypad Facility Messages.
- This activity is not affected from the “Flexible Digit Analysis”. Although this activity uses “Flexible Digit Analysis” until collecting first three digits (until translation finding the feature), digit collection part of the FPE does not use “Flexible Digit Collection”.
- If CEPT dialing sequence is not finished with octothorpe (#), after a time interval, a time-out message and a “last digit” message are received. When this message is received, it is evaluated as an error and a NACK (negative acknowledgement) tone is given to the user.

This time interval can vary for different CEPT dialing sequences (for example; according to number of digits dialed, between overlap and enblock dialing and between NDGT and STDCOLL digit collection types defined in NCOS table). Some of the test results for the available office settings (DGCOLNM: NDGT) are as follows:

|                            | <u>ENBLOCK</u> | <u>OVERLAP</u> |
|----------------------------|----------------|----------------|
| <b>*14*7831023</b>         | 40s            | 10s            |
| <b>*14</b>                 | 40s            | 40s            |
| <b>#14</b>                 | 40s            | 40s            |
| <b>*14*</b>                | 40s            | 10s            |
| <b>*14*7831023*7831093</b> | 40s            | 5s             |

## 2.6 Interactions

This activity follows the existing feature interaction rules. Existing interactions remain unchanged:

If RESL option types OTR and ORR are datafilled, Call Forward Deactivation and Interrogation are allowed. However, Activation of Call Forward is not allowed. If RESL option type TRR is datafilled, Call Forward Activation, Deactivation and Interrogation are allowed.

If OCB is active at the same DN, Call Forward Activation is not allowed according to restriction class of OCB. On the other hand, Deactivation and Interrogation are allowed to be programmed.

## 2.7 Applicable customer facing sections

### Fault Management

|        |     |
|--------|-----|
| Logs   | N/A |
| Alarms | N/A |

**Configuration**

|                    |     |
|--------------------|-----|
| Data Schema        | N/A |
| User Interface     | N/A |
| Element Management | N/A |
| Security           | N/A |
| Service Order      | N/A |
| Office Parameters  | N/A |

Accounting (includes AMA billing) N/A

Performance (includes operational measurements) N/A

## 2.8 Glossary

| Term   | Definition                                           |
|--------|------------------------------------------------------|
| BRI    | Basic Rate Interface                                 |
| WT     | World Trade                                          |
| CEPT   | Conference of European Postal and Telecommunications |
| CFNR   | Call Forward No Reply                                |
| CFB    | Call Forward Busy                                    |
| CFD    | Call Forward Don't Answer                            |
| CFU    | Call Forward Unconditional                           |
| CFx    | Call Forward                                         |
| TA     | Terminal Adaptor                                     |
| DN     | Directory Number                                     |
| MSN    | Multiple Subscriber Number                           |
| AC     | Access Code                                          |
| ETSI   | European Telecommunications Standard Institute       |
| FPE    | Feature Process Environment                          |
| KEYSET | Key telephone set                                    |

## 2.9 Recommended Reading/References

- A59034125 “ISDN BRI CEPT Call Forwarding”
- A59028702 “Support of CFx for Multiple DN's for ETSI BRI” in PLS FMDOC



- ETS 300 199, 200, 201, 202 Chapter 6.1
- AD9698 “CFB/CFD Per Key Destination” in PLS FMDOC

## ***Product = CS 2000***

### **A00006693--XA-Core IO Capacity Monitoring Toolset** ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS, PT-AAL2

#### **1.2 Description**

The IO Capacity monitoring toolset (IOCAP) provides the customer telemetry for messaging over HIOP and HCMIC.

XA-Core counts messages and bytes for each service. Software on the XA-Core accesses the measurements, calculates the messaging occupancy level, and displays the results on the IOCAP MAPCI level and the IOCAP OM group.

This feature will cause no more than 3% capacity degradation in IO capacity.

##### **1.2.1 IOCAP MAPCI display**

Following is a prototype of the IOCAP MAPCI display, which will subtend from the CAPACITY level. The display will be updated once per minute.

|          |        |            |     |         |        |          |      |
|----------|--------|------------|-----|---------|--------|----------|------|
| CATMP/HR | SMS/HR | VLR_UPD/HR | CAP | ENGBHCA | CCOVRD | CMICOVRD | PESC |
| 303001   | 180    | 398700     | 128 | 233643  | OFF    | OFF      | NO   |

|         |         |         |        |         |        |
|---------|---------|---------|--------|---------|--------|
| Service | IOUTIL% | TxMsg/s | TxSize | RxMsg/s | RxSize |
| ETHR    | 64      | 15324   | 107    | 13234   | 91     |
| CMIC    | 17      | 4102    | 202    | 1254    | 102    |
| AMDI    | 0       | 0       | 0      | 0       | 0      |

The Service column identifies the type of IO service (Ethernet, CMIC, or AMDI). IOUTIL is the calculated percentage utilization of the available system messaging capacity, based on the known IO system capacity, the average rate through other services on the same card, and the throughput on other cards. TxMsg/s, TxSize, RxMsg/s and RxSize report average transmit and receive message rates and sizes through that service. Because the MAPCI display is updated once per minute, high water mark information will not be displayed.

### 1.2.2 IOCAPCI tool

The information in the MAP display is also available through the IOCAPCI tool, in addition to the following tools:

- one month's history of hourly high water mark percent utilization for each service (Ethernet, CMIC, and AMDI), similar to DMSMON HIGHCAP.
- one month's history of hourly average percent utilization for each service.
- current hour and last hour utilization and throughput for each service

An example of the CMIC high water mark data follows. A similar output will be available for each service.

```
> iomax cmic
Maximum CMIC Utilization
```

| Date | 0 | 1 | 2 | 3  | 4 | 5 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|------|---|---|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 2/1  | 9 | 7 | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |
| 2/2  | 8 | 7 | 9 | 10 | 4 | 5 | 9 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 53 | 43 | 51 | 56 | 57 | 61 | 57 | 41 | 29 | 18 |
| 2/3  | 5 | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/4  | 3 | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/5  | 9 | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/6  | 5 | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/7  | 3 | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/8  | 9 | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/9  | 5 | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/10 | 3 | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/11 | 9 | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/12 | 5 | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/13 | 3 | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/14 | 9 | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/15 | 5 | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/16 | 3 | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/17 | 9 | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/18 | 5 | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/19 | 3 | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |

```

2/20  9  9  8  7  7  7  8  7 18 28 18 29 37 48 55 48 58 48 59 59 57 48 27 18
2/21  5  7  9  8  7  8  9  8 15 23 21 29 39 53 49 42 59 51 55 57 53 47 31 21
2/22  3  8  7  6  9  8  4  7 11 19 27 31 38 51 47 45 55 53 57 56 51 49 29 14
2/23  9  9  8  7  7  7  8  7 18 28 18 29 37 48 55 48 58 48 59 59 57 48 27 18
2/24  5  7  9  8  7  8  9  8 15 23 21 29 39 53 49 42 59 51 55 57 53 47 31 21
2/25  3  8  7  6  9  8  4  7 11 19 27 31 38 51 47 45 55 53 57 56 51 49 29 14
2/26  5  7  9  8  7  8  9  8 15 23 21 29 39 53 49 42 59 51 55 57 53 47 31 21
2/27  3  8  7  6  9  8  4  7 11 19 27 31 38 51 47 45 55 53 57 56 51 49 29 14
2/28  9  9  8  7  7  7  8  7 18 28 18 29 37 48 55 48 58 48 59 59 57 48 27 18
2/29  8  7  8 10  8  9  7
1/30  3  8  7  6  9  8  4 12 16 21 27 29 39 49 47 45 55 53 57 56 51 49 29 14
1/31  8  6  5  7  8  7  6  9 11 19 27 31 39 49 53 43 51 55 53 57 56 51 31 21

```

### 1.2.3 IO capacity OM

The information displayed in the IOCAP MAP command is also recorded in the IOCAP operational measurement, as shown below.

IOCAP

CLASS: HOLDING

START:2003/12/03 09:30:00 WED; STOP: 2003/12/03 09:45:00 WED;

SLOWSAMPLES: 9 ; FASTSAMPLES: 90 ;

INFO (IO\_SERVICE\_TYPE)

|        | IOUTIL<br>RXMSGPS | IOHWM<br>RXSIZE | TXMSGPS<br>IOTHRESH | TXSIZE |
|--------|-------------------|-----------------|---------------------|--------|
| 1 ETHR | 64<br>13234       | 72<br>84        | 15204<br>0          | 105    |
| 2 CMIC | 17<br>1254        | 18<br>63        | 1254<br>0           | 102    |
| 3 AMDI | 0<br>0            | 0<br>0          | 0<br>0              | 0      |

The IOCAP OM provides measurements of messaging rates and sizes for each service. The IO\_SERVICE\_TYPE indicates the service provided. IOUTIL refers to percentage utilization of the services on the switch. IOHWM refers to the highest level that the corresponding utilization has reached in the sample period. TXMSGPS, TxSIZE, RXMSGPS and RxSIZE report the average transmit and receive message rates and sizes through the service. The IOTHRESH register is pegged every time the service average utilization for one minute exceeds the value of new OFCENG office parameter IO\_WARNING\_THRESHOLD. This register is intended to give the customer a flexible warning that they are approaching the need to upgrade their IO system.

**1.2.4 Office parameter**

A new office parameter in table OFCENG, IO\_WARNING\_THRESHOLD, indicates the minimum IO service utilization at which the IOTHRESH register in the IOCAP OM will be pegged.

**1.3 Hardware Requirements or Dependencies**

This feature is unavailable for CMIC, Ethernet and AMDI packets (NTLX05AB, NTLX09AA, NTLX05BA respectively).

This feature is supported on all versions of NTLX04 HIOP cards and NTLX17 HCMIC cards.

**1.4 Software Requirements or Dependencies**

None.

**1.5 Limitations and restrictions**

This feature will be submitted into CSP21 and patched back to CSP20.

When the system is in transition from IOP to HIOP, the utilization of all IO services will not be available.

**1.6 Interactions**

The MAPCI level display will sub tend from the CAPACITY MAP level. It will be shown as an option from that level.

**1.7 Applicable customer facing sections****Fault Management**

Logs \_\_NA\_\_

Alarms \_\_NA\_\_

**Configuration**

Data Schema \_\_NA\_\_

User Interface \_\_X\_\_

Element Management \_\_NA\_\_

Security \_\_NA\_\_

Service Order \_\_NA\_\_

Office Parameters \_\_X\_\_

Accounting (includes AMA billing) \_\_NA\_\_

Performance (includes operational measurements) \_\_X\_\_

## 1.8 Glossary

Table 5

| Term     | Description |
|----------|-------------|
| New term | Definition  |

## *Configuration for A00006693*

### 2.1 Hardware and Software Requirements

Not applicable.

### 2.2 Initial Configuration

Not applicable.

### 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

#### 2.3.1 New/modified office/subnet parameters

Table 6 New or modified parameter

| Parm table | Parameter name           | NEW/<br>CHANGED/<br>DELETED/<br>RELOCATED | Domain (CM or<br>Subnet<br>Management) |
|------------|--------------------------|-------------------------------------------|----------------------------------------|
| OFCENG     | IO_WARNING_<br>THRESHOLD | NEW                                       | XA-Core                                |

#### 2.3.2 Parameter information

##### 2.3.2.1 IO\_WARNING\_THRESHOLD

IO\_WARNING\_THRESHOLD

###### 2.3.2.1.1 Functional description

This parameter defines a utilization warning threshold for all IO service types (CMIC, ETHR, AMDI) in the system. The IOCAP monitoring toolset uses the value of this parameter to peg the IOTHRESH register of the IOCAP OM whenever the IO utilization level of any IO service has exceeded this threshold on the switch.

###### 2.3.2.1.2 Provisioning rules

There is no formula for provisioning this office parameter. However, this office parameter should be set by the customer in such a manner that will allow sufficient advance warning time for their maintenance personnel to upgrade or reconfigure their IO devices in case the condition re-occurs often.

### 2.3.2.1.3 Range information

**Table 7 Range Information**

| Minimum | Maximum | Default |
|---------|---------|---------|
| 1       | 100     | 100     |

### 2.3.2.1.4 Activation

Any change activation for this office parameter is immediate.

### 2.3.2.1.5 Dependencies

Not applicable.

### 2.3.2.1.6 Consequences

If this office parameter is set low, the IOTHRESH register might be in pegged more often than necessary. If this office parameter is set high, the customer may not have enough advance notice to upgrade their IO configuration.

### 2.3.2.1.7 Verification

To verify, users can modify and display the value of IO\_WARNING\_THRESHOLD on table OFCENG via table control.

### 2.3.2.1.8 Memory requirements

No memory impact.

### 2.3.2.1.9 Parameter release history update

New office parameter in CSP20.

## 2.4 Upgrade Impact

Not applicable.

## 2.5 Data schema (DS) (CM, MIBS, RDB)

Not applicable.

## 2.6 Service Orders (SO) (CM & SESM)

Not applicable.

## 2.7 Software optionality control (SOC)

Not applicable.

## 2.8 Element Management

Not applicable.

## 2.9 Command interface changes

The following new directories will be provided in this feature.

## 2.9.1 Directory: CAPACITY

This existing CAPACITY MAPCI level will be modified to provide a new IOCAP MAPCI level in XA-Core only. The new IOCAP level will provide IO utilization and IO messaging throughput information for HCMIC and HIOP IO cards.

### 2.9.1.1 Directory description

This new IOCAP MAPCI level will be giving the IO utilization values and messaging throughput information for each IO service type (CMIC, ETHR and AMDI). The information on this new MAPCI level will be updated once every minute.

### 2.9.1.2 Accessing directory: CAPACITY

#### 2.9.1.2.1 Access to directory or MAP level and return to CI

To access this directory, type:

```
> MAPCI; MTC; CAPACITY
```

To return to the CI environment, type:

```
> QUIT ALL
```

## 2.9.2 Command: IOCAP

This is a new command available under the CAPACITY MAPCI level in XA-Core only.

### 2.9.2.1 Command type: Listed MENU

### 2.9.2.2 Command target: XA-Core only

### 2.9.2.3 Command availability: RES

### 2.9.2.4 Command description

This new IOCAP MAPCI level will be giving the IO utilization values and messaging throughput information for each IO service type (CMIC, ETHR and AMDI). The information on this new MAPCI level will be updated once every minute.

### 2.9.2.5 Command syntax

**Table 8 IOCAP command parameters and variables**

| Command                  | Parameters and variables |
|--------------------------|--------------------------|
| IOCAP                    | none                     |
| Parameters and variables | Description              |

### 2.9.2.6 Qualifications and warnings

Not applicable.

### 2.9.2.7 Responses

#### 2.9.2.7.1 IOCAP response

**Table 9** MAP outputs with associated meanings and actions

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Service: The type of IO service of the values shown on the same line is captured.</p> <p><b>Meaning:</b> Possible IO service types are CMIC, ETHR and AMDI.</p> <p><b>System or user actions:</b> Not applicable</p> <p>IOUTIL%: The average utilization of all active links in the system captured in the previous minute.</p> <p><b>Meaning:</b> The value is given as a percent of total system and can take up to 3 digits.</p> <p><b>System or user actions:</b> Not applicable</p> <p>TxMsg/s: The average number of transmitted messages captured in the last minute for this IO service type.</p> <p><b>Meaning:</b> The unit is number of transmitted messages per second.</p> <p><b>System or user actions:</b> Not applicable</p> <p>TxSize: The average size (in bytes) of all transmitted messages in the last minute.</p> <p><b>Meaning:</b> The unit is in bytes.</p> <p><b>System or user actions:</b> Not applicable</p> <p>RxMsg/s: The average number of received messages captured in the last minute for this IO service type.</p> <p><b>Meaning:</b> The value unit is the number of received messages per second.</p> <p><b>System or user actions:</b> Not applicable</p> <p>RxSize: The average size (in bytes) of all received messages in the last minute.</p> <p><b>Meaning:</b> The unit is in bytes.</p> <p><b>System or user actions:</b> Not applicable</p> |

This MAPCI level can be used for monitoring current IO throughput. Under normal condition, there is no response required from maintenance personnel. The descriptions of all fields displayed under this level are given above. These responses are seen in XA-core only.



### 2.9.2.8 Example

**Table 10 Usage examples for IOCAP command**

|                      |                                                                                                                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description of task: | This new IOCAP MAPCI level will be giving the IO utilization values and messaging throughput information for each IO service type (CMIC, ETHR and AMDI). The information on this new MAPCI level will be updated once every minute. |
| Command:             | MAPCI; MTC; CAPACITY; IOCAP                                                                                                                                                                                                         |
| MAP response:        | See example output below.                                                                                                                                                                                                           |

An example output of this new MAPCI level is given below.

#### IOCAP MAPCI Level

| XACM         | MS       | IOD     | Net      | PM       | CCS      | Ins    | Trks     | Ext  | APPL |
|--------------|----------|---------|----------|----------|----------|--------|----------|------|------|
| .            | .        | .       | .        | .        | .        | .      | .        | .    | .    |
| IOCAP        |          |         |          |          |          |        |          |      |      |
| 0 Quit       | CATMP/HR | UTIL    | ENGCATMP | MAXCATMP | ENGLEVEL | CCOVRD | CMICOVRD | PESC |      |
| 2            | 120000   | 75      | 160000   | 200000   | BELOW    | OFF    | OFF      | NO   |      |
| 3            |          |         |          |          |          |        |          |      |      |
| 4            | Service  | IOUTIL% | TxMsg/s  | TxSize   | RxMsg/s  | RxSize |          |      |      |
| 5            |          |         |          |          |          |        |          |      |      |
| 6            | AMDI     | 64      | 15324    | 107      | 13234    | 91     |          |      |      |
| 7            | CMIC     | 17      | 4102     | 202      | 1254     | 102    |          |      |      |
| 8            | ETHR     | 10      | 8967     | 123      | 3456     | 123    |          |      |      |
| 9            |          |         |          |          |          |        |          |      |      |
| 10           | IOCAP:   |         |          |          |          |        |          |      |      |
| 11           |          |         |          |          |          |        |          |      |      |
| 12           |          |         |          |          |          |        |          |      |      |
| 13           |          |         |          |          |          |        |          |      |      |
| 14           |          |         |          |          |          |        |          |      |      |
| 15           |          |         |          |          |          |        |          |      |      |
| 16           |          |         |          |          |          |        |          |      |      |
| 17           |          |         |          |          |          |        |          |      |      |
| 18           |          |         |          |          |          |        |          |      |      |
| XMAP0        |          |         |          |          |          |        |          |      |      |
| Time 14:12 > |          |         |          |          |          |        |          |      |      |

### 2.9.3 Command: QUIT

This command will allow the user to exit IOCAP MAPCI level and to return to IOCAP higher MAPCI level (CAPACITY MAPCI level).

#### 2.9.3.1 Command type: Listed MENU

This QUIT command is listed in IOCAP menu.

#### 2.9.3.2 Command target: XA-Core only

This new IOCAP QUIT command is available in XA-Core only.

### 2.9.3.3 Command availability: RES

### 2.9.3.4 Command description

This command will allow the user to exit IOCAP MAPCI level and to return to IOCAP higher MAPCI level (CAPACITY MAPCI level).

### 2.9.3.5 Command syntax

**Table 11** QUIT command parameters and variables

| Command | Parameters and variables |
|---------|--------------------------|
| QUIT    | none                     |

### 2.9.3.6 Qualifications and warnings

Not applicable.

### 2.9.3.7 Responses

#### 2.9.3.7.1 QUIT

**Table 12** MAP outputs with associated meanings and actions

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| If QUIT is issued, the user will be returned to one MAPCI level higher than their current MAPCI level.<br><br>If QUIT ALL is issued, the user will be returned to CI level.<br><br><b>Meaning:</b> Not applicable.<br><br><b>System or user actions:</b> Not applicable.<br><br>Meaning: The IOCAP MAPCI level is exited and the user is returned to one MAPCI level higher or to CI level.<br><br>System or user actions: Not applicable. |

### 2.9.3.8 Example

**Table 13** Usage examples for QUIT command

|                     |                                                                                       |
|---------------------|---------------------------------------------------------------------------------------|
| Description of task | Exit the IOCAP MAPCI level and return the user to CI level or one MAPCI level higher. |
| Command:            | Example: QUIT ALL                                                                     |
| MAP response:       | Example: >                                                                            |

## 2.9.4 Directory: IOCAPCI

### 2.9.4.1 Directory description

This new IOCAPCI is provided to allow customers to display the IO utilization history data.

## 2.9.4.2 Accessing directory: IOCAPCI

### 2.9.4.2.1 Access to directory or MAP level and return to CI

To access this directory type:

> IOCAPCI

To return to CI environment, type:

> QUIT

## 2.9.5 Command: IOMAX

### 2.9.5.1 Command type: NON-MENU

### 2.9.5.2 Command target: XA-Core only

### 2.9.5.3 Command availability: RES

### 2.9.5.4 Command description

This command displays the hourly high watermark value captured for each IO service type (CMIC, ETHR or AMDI). The value is captured every hour of day for the last 31 days. The data survives all types of restarts (warm, cold and reload).

The date of the month will be in sequence. For every hour in the future (there is no data collected yet), a blank character will be displayed.

### 2.9.5.5 Command syntax

The command syntax for this command is as follows.

```
> q iomax
Display IO high watermark report.
Parms: <service> {CMIC,
                  ETHR,
                  ATM,
                  ALL}
```

**Table 14 IOMAX command parameters and variables**

| Command                  | Parameters and variables                    |
|--------------------------|---------------------------------------------|
| IOMAX                    | service                                     |
| IOMAX                    | <Service> (CMIC, ETHR, AMDI, ALL)           |
| Parameters and variables | Description                                 |
| Service                  | Possible values are CMIC, ETHR, AMDI or ALL |
| CMIC                     | Displays only CMIC hourly max history data  |
| ETHR                     | Displays only ETHR hourly max history data  |

**Table 14 IOMAX command parameters and variables**

| Command | Parameters and variables                                       |
|---------|----------------------------------------------------------------|
| AMDI    | Displays only AMDI hourly max history data                     |
| All     | Displays all hourly.max history data for CMIC, ETHR, and AMDI. |

### 2.9.5.6 Qualifications and warnings

Not applicable.

### 2.9.5.7 Responses

#### 2.9.5.7.1 IOMAX response

The following is the response if IOMAX CMIC is issued.

**Table 15 MAP outputs with associated meanings and actions**

| Command                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IOMAX CMIC: history data of CMIC hourly maximum utilization are displayed.<br><b>Meaning:</b> CMIC hourly maximum history data are displayed.<br><b>System or user actions:</b> Not applicable.                                       |
| IOMAX ETHR: history data of ETHR hourly maximum utilization are displayed.<br><b>Meaning:</b> history data of ETHR hourly maximum utilization are displayed.<br><b>System or user actions:</b> Not applicable.                        |
| IOMAX AMDI: history data of AMDI hourly maximum utilization are displayed.<br><b>Meaning:</b> history data of AMDI hourly maximum utilization are displayed.<br><b>System or user actions:</b> Not applicable.                        |
| IOMAX ALL: history data of CMIC, ETHR, AMDI hourly maximum utilization are displayed.<br><b>Meaning:</b> history data of CMIC, ETHR, AMDI hourly maximum utilization are displayed.<br><b>System or user actions:</b> Not applicable. |

### 2.9.5.8 Example

**Table 16 Usage examples for IOMAX command**

|                     |                                                        |
|---------------------|--------------------------------------------------------|
| Description of task | Display the history data of IO hourly max utilization. |
|---------------------|--------------------------------------------------------|

Table 16 Usage examples for IOMAX command

|                              |                          |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------|--------------------------|---|---|----|---|---|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|
| Command:<br>MAP<br>response: | Example: IOMAX CMIC      |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Example:                 |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Maximum CMIC Utilization |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Date                     | 0 | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | Hour |    | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 2/1                          | 9                        | 7 | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55   | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |    |
| 2/2                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/3                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/4                          | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/5                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/6                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/7                          | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/8                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/9                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/10                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/11                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/12                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/13                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/14                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/15                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/16                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/17                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/18                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/19                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/20                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/21                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/22                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/23                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/24                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/25                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/26                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/27                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/28                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/29                         | 8                        | 7 | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |

|                              |                          |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------|--------------------------|---|---|----|---|---|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|
| Command:<br>MAP<br>response: | Example: IOMAX ETHR      |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Example:                 |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Maximum ETHR Utilization |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Date                     | 0 | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | Hour |    | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 2/1                          | 9                        | 7 | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55   | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |    |
| 2/2                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/3                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/4                          | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/5                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/6                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/7                          | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/8                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/9                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/10                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/11                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/12                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/13                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/14                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/15                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/16                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/17                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/18                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/19                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/20                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/21                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/22                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/23                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/24                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/25                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/26                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |
| 2/27                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 2/28                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |
| 2/29                         | 8                        | 7 | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |
| 1/31                         | 8                        | 6 | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49   | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |    |

**Table 16 Usage examples for IOMAX command**

|                              |                          |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------|--------------------------|---|---|----|---|---|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Command:<br>MAP<br>response: | Example: IOMAX AMDI      |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Example:                 |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Maximum AMDI Utilization |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Date                     | 0 | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | Hour |    | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 2/1                          | 9                        | 7 | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55   | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |    |    |
| 2/2                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/3                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/4                          | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/5                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/6                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/7                          | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/8                          | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/9                          | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/10                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/11                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/12                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/13                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/14                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/15                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/16                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/17                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/18                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/19                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/20                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/21                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/22                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/23                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/24                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/25                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/26                         | 5                        | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/27                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/28                         | 9                        | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/29                         | 8                        | 7 | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                         | 3                        | 8 | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 1/31                         | 8                        | 6 | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49   | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |    |    |

Table 16 Usage examples for IOMAX command

|                              |                                      |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------|--------------------------------------|------|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Command:<br>MAP<br>response: | Example: IOMAX ALL                   |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Example:<br>Maximum CMIC Utilization |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              |                                      | Hour |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Date                                 | 0    | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|                              | 2/1                                  | 9    | 7 | 8  | 6 | 5 | 7 | 8  | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |
|                              | 2/2                                  | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                              | 2/3                                  | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                              | 2/4                                  | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                              | 2/5                                  | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                              | 2/6                                  | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/7                          | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/8                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/9                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/10                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/11                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/12                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/13                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/14                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/15                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/16                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/17                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/18                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/19                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/20                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/21                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/22                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/23                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/24                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/25                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/26                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/27                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/28                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/29                         | 8                                    | 7    | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 1/31                         | 8                                    | 6    | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |
|                              | Maximum ETHR Utilization             |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              |                                      | Hour |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Date                         | 0                                    | 1    | 2 | 3  | 4 | 5 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |
| 2/1                          | 9                                    | 7    | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |
| 2/2                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/3                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/4                          | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/5                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/6                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/7                          | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/8                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/9                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/10                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/11                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/12                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/13                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/14                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/15                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/16                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/17                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/18                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/19                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/20                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/21                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/22                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/23                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/24                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/25                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/26                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/27                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/28                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/29                         | 8                                    | 7    | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 1/31                         | 8                                    | 6    | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |

**Table 16 Usage examples for IOMAX command**

|      | Maximum AMDI Utilization |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------|--------------------------|------|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|      | Date                     | Hour |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                          | 0    | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 2/1  | 9                        | 7    | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |
| 2/2  | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/3  | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/4  | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/5  | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/6  | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/7  | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/8  | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/9  | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/10 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/11 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/12 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/13 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/14 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/15 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/16 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/17 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/18 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/19 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/20 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/21 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/22 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/23 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/24 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/25 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/26 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/27 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/28 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/29 | 8                        | 7    | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 1/31 | 8                        | 6    | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |

## 2.9.6 Command: IOAVG

### 2.9.6.1 Command type: NON-MENU

### 2.9.6.2 Command target: XA-Core only

### 2.9.6.3 Command availability: RES

### 2.9.6.4 Command description

This command displays the hourly average value captured for each IO service type (CMIC, ETHR or AMDI). The value is captured every hour of day for the last 31 days. The data survives all types of restarts (warm, cold and reload).

The date of the month will be in sequence. For every hour in the future (there is no data collected yet), a blank character will be displayed.

### 2.9.6.5 Command syntax

The command syntax for this command is as follows.

```
> q ioavg
Display IO average report.
Parms: <service> {CMIC,
                  ETHR,
                  ATM,
```



ALL}

**Table 17 IOAVG command parameters and variables**

| Command                  | Parameters and variables                                           |
|--------------------------|--------------------------------------------------------------------|
| IOAVG                    | service                                                            |
| IOAVG                    | <Service> (CMIC, ETHR, AMDI, ALL)                                  |
| Parameters and variables | Description                                                        |
| Service                  | Possible values are CMIC, ETHR, AMDI or ALL                        |
| CMIC                     | Displays only CMIC hourly average history data                     |
| ETHR                     | Displays only ETHR hourly average history data                     |
| AMDI                     | Displays only AMDI hourly average history data                     |
| All                      | Displays all hourly average history data for CMIC, ETHR, and AMDI. |

**2.9.6.6 Qualifications and warnings**

Not applicable.

**2.9.6.7 Responses****2.9.6.7.1 IOAVG response**

The following is the response if IOAVG CMIC is issued.

**Table 18 MAP outputs with associated meanings and actions**

| Command                                                                        |
|--------------------------------------------------------------------------------|
| IOAVG CMIC: history data of CMIC hourly average utilization are displayed.     |
| <b>Meaning:</b> CMIC hourly average history data are displayed.                |
| <b>System or user actions:</b> Not applicable.                                 |
| IOAVG ETHR: history data of ETHR hourly average utilization are displayed.     |
| <b>Meaning:</b> history data of ETHR hourly average utilization are displayed. |
| <b>System or user actions:</b> Not applicable.                                 |
| IOAVG AMDI: history data of AMDI hourly average utilization are displayed.     |
| <b>Meaning:</b> history data of AMDI hourly average utilization are displayed. |
| <b>System or user actions:</b> Not applicable.                                 |

**Table 18 MAP outputs with associated meanings and actions**

| Command                                                                               |
|---------------------------------------------------------------------------------------|
| IOAVG ALL: history data of CMIC, ETHR, AMDI hourly average utilization are displayed. |
| Meaning: history data of CMIC, ETHR, AMDI hourly average utilization are displayed.   |
| System or user actions: Not applicable.                                               |

### 2.9.6.8 Example

**Table 19 Usage examples for IOAVG command**

| Description of task       | Display the history data of IO hourly average utilization. |   |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|---------------------------|------------------------------------------------------------|---|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Command: MAP<br>response: | Example: IOAVG CMIC<br>Example: Average CMIC Utilization   |   |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                           | Date                                                       | 0 | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|                           | 2/1                                                        | 9 | 7 | 8  | 6 | 5 | 7 | 8  | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |
|                           | 2/2                                                        | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/3                                                        | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/4                                                        | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/5                                                        | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/6                                                        | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/7                                                        | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/8                                                        | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/9                                                        | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/10                                                       | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/11                                                       | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/12                                                       | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/13                                                       | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/14                                                       | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/15                                                       | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/16                                                       | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/17                                                       | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/18                                                       | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/19                                                       | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/20                                                       | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
|                           | 2/21                                                       | 5 | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
|                           | 2/22                                                       | 3 | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
|                           | 2/23                                                       | 9 | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/24                      | 5                                                          | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/25                      | 3                                                          | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/26                      | 5                                                          | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |
| 2/27                      | 3                                                          | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 2/28                      | 9                                                          | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |
| 2/29                      | 8                                                          | 7 | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                      | 3                                                          | 8 | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |
| 1/31                      | 8                                                          | 6 | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |

**Table 19 Usage examples for IOAVG command**

|                              |                                      |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------|--------------------------------------|---|---|----|---|---|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Command:<br>MAP<br>response: | Example: IOAVG ETHR                  |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Example:<br>Average ETHR Utilization |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Date                                 | 0 | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | Hour |    | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 2/1                          | 9                                    | 7 | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55   | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |    |    |
| 2/2                          | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/3                          | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/4                          | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/5                          | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/6                          | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/7                          | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/8                          | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/9                          | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/10                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/11                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/12                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/13                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/14                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/15                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/16                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/17                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/18                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/19                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/20                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/21                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/22                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/23                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/24                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/25                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/26                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/27                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/28                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/29                         | 8                                    | 7 | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 1/31                         | 8                                    | 6 | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49   | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |    |    |

|                              |                                      |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------|--------------------------------------|---|---|----|---|---|---|----|----|----|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Command:<br>MAP<br>response: | Example: IOAVG AMDI                  |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Example:<br>Average AMDI Utilization |   |   |    |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                              | Date                                 | 0 | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | Hour |    | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| 2/1                          | 9                                    | 7 | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55   | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |    |    |
| 2/2                          | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/3                          | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/4                          | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/5                          | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/6                          | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/7                          | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/8                          | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/9                          | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/10                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/11                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/12                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/13                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/14                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/15                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/16                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/17                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/18                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/19                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/20                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/21                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/22                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/23                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/24                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/25                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/26                         | 5                                    | 7 | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53   | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |    |    |
| 2/27                         | 3                                    | 8 | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51   | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |    |    |
| 2/28                         | 9                                    | 9 | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48   | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |    |    |
| 2/29                         | 8                                    | 7 | 8 | 10 |   |   |   |    |    |    |    |    |    |      |    |    |    |    |    |    |    |    |    |    |    |    |    |

**Table 19 Usage examples for IOAVG command**

|                              |                                      |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|------------------------------|--------------------------------------|------|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|--|
| Command:<br>MAP<br>response: | Example: IOAVG ALL                   |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|                              | Example:<br>Average CMIC Utilization |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|                              |                                      | Hour |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|                              | Date                                 | 0    | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |  |
|                              | 2/1                                  | 9    | 7 | 8  | 6 | 5 | 7 | 8  | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |  |
|                              | 2/2                                  | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/3                                  | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/4                                  | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
|                              | 2/5                                  | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/6                                  | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/7                                  | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
|                              | 2/8                                  | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/9                                  | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/10                                 | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
|                              | 2/11                                 | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/12                                 | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/13                                 | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
|                              | 2/14                                 | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/15                                 | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/16                                 | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
|                              | 2/17                                 | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/18                                 | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/19                                 | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
|                              | 2/20                                 | 9    | 9 | 8  | 7 | 7 | 7 | 8  | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |  |
|                              | 2/21                                 | 5    | 7 | 9  | 8 | 7 | 8 | 9  | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |  |
|                              | 2/22                                 | 3    | 8 | 7  | 6 | 9 | 8 | 4  | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |  |
| 2/23                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/24                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/25                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/26                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/27                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/28                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/29                         | 8                                    | 7    | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 1/30                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 1/31                         | 8                                    | 6    | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |  |
|                              | Average ETHR Utilization             |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
|                              | Hour                                 |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| Date                         | 0                                    | 1    | 2 | 3  | 4 | 5 | 6 | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |    |  |
| 2/1                          | 9                                    | 7    | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |    |  |
| 2/2                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/3                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/4                          | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/5                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/6                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/7                          | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/8                          | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/9                          | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/10                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/11                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/12                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/13                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/14                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/15                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/16                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/17                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/18                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/19                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/20                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/21                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/22                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/23                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/24                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/25                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/26                         | 5                                    | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |    |  |
| 2/27                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 2/28                         | 9                                    | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |    |  |
| 2/29                         | 8                                    | 7    | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |  |
| 1/30                         | 3                                    | 8    | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |    |  |
| 1/31                         | 8                                    | 6    | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |    |  |

**Table 19 Usage examples for IOAVG command**

|      | Average AMDI Utilization |      |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------|--------------------------|------|---|----|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|      | Date                     | Hour |   |    |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|      |                          | 0    | 1 | 2  | 3 | 4 | 5 | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 2/1  | 9                        | 7    | 8 | 6  | 5 | 7 | 8 | 11 | 17 | 22 | 28 | 30 | 40 | 55 | 50 | 47 | 61 | 57 | 59 | 62 | 59 | 39 | 31 | 21 |
| 2/2  | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/3  | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/4  | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/5  | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/6  | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/7  | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/8  | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/9  | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/10 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/11 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/12 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/13 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/14 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/15 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/16 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/17 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/18 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/19 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/20 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/21 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/22 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/23 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/24 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/25 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/26 | 5                        | 7    | 9 | 8  | 7 | 8 | 9 | 8  | 15 | 23 | 21 | 29 | 39 | 53 | 49 | 42 | 59 | 51 | 55 | 57 | 53 | 47 | 31 | 21 |
| 2/27 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 7  | 11 | 19 | 27 | 31 | 38 | 51 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 2/28 | 9                        | 9    | 8 | 7  | 7 | 7 | 8 | 7  | 18 | 28 | 18 | 29 | 37 | 48 | 55 | 48 | 58 | 48 | 59 | 59 | 57 | 48 | 27 | 18 |
| 2/29 | 8                        | 7    | 8 | 10 | 8 | 9 | 7 |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 1/30 | 3                        | 8    | 7 | 6  | 9 | 8 | 4 | 12 | 16 | 21 | 27 | 29 | 39 | 49 | 47 | 45 | 55 | 53 | 57 | 56 | 51 | 49 | 29 | 14 |
| 1/31 | 8                        | 6    | 5 | 7  | 8 | 7 | 6 | 9  | 11 | 19 | 27 | 31 | 39 | 49 | 53 | 43 | 51 | 55 | 53 | 57 | 56 | 51 | 31 | 21 |

## 2.9.7 Command: DISP

### 2.9.7.1 Command type: NON-MENU

### 2.9.7.2 Command target: XA-Core only

### 2.9.7.3 Command availability: RES

### 2.9.7.4 Command description

This DISP command displays the utilization and messaging throughput values of each IO service type of the last 60 minutes with option CURR (for example, when a command is issued at 2:35, displayed data is from 1:34 to 2:34) or previous full hour with option PREV (for example when a command is issued at 2:35, displayed data is from 1:00 to 2:00). This information survives all types of restarts (warm, cold and reload).

### 2.9.7.5 Command syntax

The command syntax for this command is as follows.

```
> q disp
Display table of IO utilization.
Parms: <when> {CURR,
               PREV}
        <service> {CMIC,
                   ETHR,
                   ATM,
                   ALL}
```

**Table 20 DISP command parameters and variables**

| Command                  | Parameters and variables                                                                              |
|--------------------------|-------------------------------------------------------------------------------------------------------|
| DISP                     | <when> <service>                                                                                      |
| DISP                     | <when> (CURR, PREV)                                                                                   |
|                          | <service> (CMIC, ETHR, AMDI, ALL)                                                                     |
| Parameters and variables | Description                                                                                           |
| When                     | Possible values are CURR or PREV                                                                      |
| CURR                     | Displays the last 60 minutes utilization and messaging throughput of the specified IO service type    |
| PREV                     | Displays the previous full hour utilization and messaging throughput of the specified IO service type |
| Service                  | Possible values are CMIC, ETHR, AMDI or ALL                                                           |
| CMIC                     | Displays only CMIC utilization and messaging throughput                                               |
| ETHR                     | Displays only ETHR utilization and messaging throughput                                               |
| AMDI                     | Displays only AMDI utilization and messaging throughput                                               |
| ALL                      | Displays utilization and messaging throughput for CMIC, ETHR, and AMDI.                               |

**2.9.7.6 Qualifications and warnings**

Not applicable.

**2.9.7.7 Responses****2.9.7.7.1 DISP response**

The following is the response if DISP CURR CMIC is issued.

**Table 21 MAP outputs with associated meanings and actions**

| Command                                                                                           |
|---------------------------------------------------------------------------------------------------|
| DISP CURR CMIC: last 60 minutes of CMIC utilization and messaging throughput are displayed.       |
| <b>Meaning:</b> last 60 minutes data for CMIC utilization and messaging throughput are displayed. |
| <b>System or user actions:</b> Not applicable.                                                    |
| DISP CURR ETHR: last 60 minutes of ETHR utilization and messaging throughput are displayed.       |
| <b>Meaning:</b> last 60 minutes of ETHR utilization and messaging throughput are displayed.       |
| <b>System or user actions:</b> Not applicable.                                                    |

**Table 21 MAP outputs with associated meanings and actions**

| Command                                                                                     |
|---------------------------------------------------------------------------------------------|
| DISP CURR AMDI: last 60 minutes of AMDI utilization and messaging throughput are displayed. |
| Meaning: last 60 minutes of AMDI utilization and messaging throughput are displayed.        |
| System or user actions: Not applicable.                                                     |
| DISP CURR ALL: last 60 minutes of CMIC, ETHR, AMDI utilization are displayed.               |
| Meaning: last 60 minutes of CMIC, ETHR, AMDI utilization are displayed.                     |
| System or user actions: Not applicable.                                                     |

### 2.9.7.8 Example

**Table 22 Usage examples for DISP command**

|                     |                                                                         |         |         |        |         |        |
|---------------------|-------------------------------------------------------------------------|---------|---------|--------|---------|--------|
| Description of task | Display the last 60 minutes of IO utilization and messaging throughput. |         |         |        |         |        |
| Command:            | Example: DISP CURR CMIC                                                 |         |         |        |         |        |
| MAP                 | Example:                                                                |         |         |        |         |        |
| response:           | Time                                                                    | IOUTIL% | TxMsg/s | TxSize | RxMsg/s | RxSize |
|                     | 16:17                                                                   | 45      | 23421   | 34     | 23421   | 34     |
|                     | 16:18                                                                   | 39      | 22119   | 31     | 21228   | 32     |
|                     | 16:19                                                                   | 38      | 21228   | 32     | 22119   | 31     |
|                     | 16:20                                                                   | 39      | 23421   | 31     | 21221   | 31     |
|                     | . . .                                                                   | . . .   | . . .   | . . .  | . . .   | . . .  |
|                     | 17:14                                                                   | 41      | 20023   | 32     | 20019   | 33     |
|                     | 17:15                                                                   | 39      | 21221   | 31     | 21228   | 32     |
|                     | 17:16                                                                   | 38      | 20019   | 33     | 23421   | 34     |
| Command:            | Example: DISP CURR ETHR                                                 |         |         |        |         |        |
| MAP                 | Example:                                                                |         |         |        |         |        |
| response:           | Time                                                                    | IOUTIL% | TxMsg/s | TxSize | RxMsg/s | RxSize |
|                     | 16:17                                                                   | 45      | 23421   | 34     | 23421   | 34     |
|                     | 16:18                                                                   | 39      | 22119   | 31     | 21228   | 32     |
|                     | 16:19                                                                   | 38      | 21228   | 32     | 22119   | 31     |
|                     | 16:20                                                                   | 39      | 23421   | 31     | 21221   | 31     |
|                     | . . .                                                                   | . . .   | . . .   | . . .  | . . .   | . . .  |
|                     | 17:14                                                                   | 41      | 20023   | 32     | 20019   | 33     |
|                     | 17:15                                                                   | 39      | 21221   | 31     | 21228   | 32     |
|                     | 17:16                                                                   | 38      | 20019   | 33     | 23421   | 34     |
| Command:            | Example: DISP CURR AMDI                                                 |         |         |        |         |        |
| MAP                 | Example:                                                                |         |         |        |         |        |
| response:           | Time                                                                    | IOUTIL% | TxMsg/s | TxSize | RxMsg/s | RxSize |
|                     | 16:17                                                                   | 45      | 23421   | 34     | 23421   | 34     |
|                     | 16:18                                                                   | 39      | 22119   | 31     | 21228   | 32     |
|                     | 16:19                                                                   | 38      | 21228   | 32     | 22119   | 31     |
|                     | 16:20                                                                   | 39      | 23421   | 31     | 21221   | 31     |
|                     | . . .                                                                   | . . .   | . . .   | . . .  | . . .   | . . .  |
|                     | 17:14                                                                   | 41      | 20023   | 32     | 20019   | 33     |
|                     | 17:15                                                                   | 39      | 21221   | 31     | 21228   | 32     |
|                     | 17:16                                                                   | 38      | 20019   | 33     | 23421   | 34     |

**Table 22 Usage examples for DISP command**

|           |                        |          |          |          |
|-----------|------------------------|----------|----------|----------|
| Command:  | Example: DISP CURR ALL |          |          |          |
| MAP       | Example:               |          |          |          |
| response: | Time                   | CMICUTIL | ETHRUTIL | AMDIUTIL |
|           | 16:17                  | 45       | 21       | 34       |
|           | 16:18                  | 39       | 19       | 31       |
|           | 16:19                  | 38       | 18       | 32       |
|           | 16:20                  | 39       | 21       | 31       |
|           | . . . . .              |          |          |          |
|           | 17:14                  | 41       | 23       | 32       |
|           | 17:15                  | 39       | 21       | 31       |
|           | 17:16                  | 38       | 19       | 33       |

## 2.9.8 Command: STATUS

### 2.9.8.1 Command type: NON-MENU

### 2.9.8.2 Command target: XA-Core only

### 2.9.8.3 Command availability: RES

### 2.9.8.4 Command description

This command displays all status information including current version of IOCAPCI tool, timestamp in terms of hour and minute, the current IO utilization values of all IO services (CMIC, ETHR, AMDI), the current value of the IO\_WARNING\_THRESHOLD office parm.

### 2.9.8.5 Command syntax

The command syntax for this command is as follows.

```
> q STATUS
Display current IOCAP status.
```

**Table 23 STATUS command parameters and variables**

| Command | Parameters and variables |
|---------|--------------------------|
| STATUS  | no parameter             |

### 2.9.8.6 Qualifications and warnings

Not applicable.

### 2.9.8.7 Responses

#### 2.9.8.7.1 STATUS response

The following is the response if STATUS is issued.



**Table 24** MAP outputs with associated meanings and actions

| Command                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------|
| STATUS: Status information such as IOCAPCI version, current utilizations and IO_WARNING_THRESHOLD office parm are displayed.         |
| <b>Meaning:</b> Status information such as IOCAPCI version, current utilizations and IO_WARNING_THRESHOLD office parm are displayed. |
| <b>System or user actions:</b> Not applicable.                                                                                       |

### 2.9.8.8 Example

**Table 25** Usage examples for STATUS command

|                     |                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description of task | Display status information such as IOCAPCI version, current utilizations and IO_WARNING_THRESHOLD office parm.                                              |
| Command:            | Example: DISP CURR CMIC                                                                                                                                     |
| MAP                 | Example:                                                                                                                                                    |
| response:           | <pre>&gt; status IOCAP Version 1.0 Time    CMICUTIL  ETHRUTIL  AMDIUTIL 17:16      32      29      15 IO_WARNING_THRESHOLD office parm is set to 100.</pre> |

## 2.10 Security

Not applicable.

### 2.10.1 Network configuration

Not applicable.

### 2.10.2 Key management

Not applicable.

### 2.10.3 Protocol

Not applicable.

### 2.10.4 Authentication

Not applicable.

## 2.11 Configuration Walkthrough

Not applicable.

## 3: Performance for A00006693

## 3.1 Performance management strategy

## 3.2 Performance management tools and utilities

The new OM group can be displayed and collected via OMSHOW interface regularly by Telcos to monitor system IO throughput.

## 3.3 Performance Measurements (PM), Operational Measurements (OM), and stats

This feature will provide a new OM group IOCAP.

### 3.3.1 PM, OM, and stats format

#### 3.3.2 OM Group template (applies only to DMS)

New OM group IOCAP provides information on IO capacity such as utilization and utilization high watermark and IO throughput information on a per IO service type (CMIC, ETHR and AMDI).

##### 3.3.2.1 OM description

OM group IOCAP provides one tuple per IO service type available in the office. Possible IO service types are CMIC, ETHR and AMDI.

Key field: IO\_SERVICE.

Info field: none.

##### 3.3.2.2 Release history update

The OM group is being created in CSP21 and will be patched backed to CSP20.

##### 3.3.2.3 Registers

OM group registers display on the MAP terminal as follows:

**Figure 1 OM Group Display**

|            |          |       |         |        |         |
|------------|----------|-------|---------|--------|---------|
| IO_SERVICE | IOUTIL   | IOHWM | TXMSGPS | TXSIZE | RXMSGPS |
| RXSIZE     | IOTHRESH |       |         |        |         |

##### 3.3.2.4 Group structure

OM group provides one tuple for each IO service type. There are 3 possible IO service types (CMIC, ETHR, AMDI).

Key field: IO\_SERVICE indicates the IO service type the information is captured. Possible IO service types are CMIC, ETHR, and AMDI. The service type is displayed as a 4 character string (CMIC, ETHR, AMDI).

Info field: None.

#### **3.3.2.5 Associated OM groups**

Not applicable.

#### **3.3.2.6 Associated functional groups**

The following functional groups are associated with OM group: none

#### **3.3.2.7 OM group registers logic flow chart**

Not applicable.

### **3.3.3 Register (applies only to DMS)**

IOHWM

#### **3.3.3.1 Register description**

IOHWM is a high watermark register holding the highest utilization value of the specified IO service type over the OM transfer period.

#### **3.3.3.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

#### **3.3.3.3 Associated registers**

None.

#### **3.3.3.4 Associated logs**

None.

### **3.3.4 Register (applies only to DMS)**

IOTHRESH

#### **3.3.4.1 Register description**

IOTHRESH is a peg register holding the number of one minute intervals in the transfer period the IO utilization has exceeded the value of the IO\_WARNING\_THRESHOLD office parm.

#### **3.3.4.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

#### **3.3.4.3 Associated registers**

None.

#### **3.3.4.4 Associated logs**

None.

### **3.3.5 Register (applies only to DMS)**

IOUTIL

**3.3.5.1 Register description**

IOUTIL is a usage register holding the average utilization value of the specified IO service type. This value is accumulated every minute and the average is calculated for every OM transfer period.

**3.3.5.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

**3.3.5.3 Associated registers**

None.

**3.3.5.4 Associated logs**

None.

**3.3.6 Register (applies only to DMS)**

RXMSGPS

**3.3.6.1 Register description**

RXMSGPS is a usage register holding the average total system number of received messages of the specified IO service type. This value is accumulated every minute and the average is calculated for every OM transfer period. The unit is the number of messages per second.

**3.3.6.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

**3.3.6.3 Associated registers**

None.

**3.3.6.4 Associated logs**

None.

**3.3.7 Register (applies only to DMS)**

RXSIZE

**3.3.7.1 Register description**

RXSIZE is a usage register holding the average incoming message size of the specified IO service type. This value is accumulated every minute and the average is calculated for every OM transfer period. The message size unit is in bytes.

**3.3.7.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

**3.3.7.3 Associated registers**

None.

**3.3.7.4 Associated logs**

None.

**3.3.8 Register (applies only to DMS)**

TXMSGPS

**3.3.8.1 Register description**

TXMSGPS is a usage register holding the average total number of outgoing messages of the specified IO service type. This value is accumulated once every minute and the average is calculated for every OM transfer period. The unit is in number of messages per second.

**3.3.8.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

**3.3.8.3 Associated registers**

None.

**3.3.8.4 Associated logs**

None.

**3.3.9 Register (applies only to DMS)**

TXSIZE

**3.3.9.1 Register description**

TXSIZE is a usage register holding the value of average size of outgoing messages of the specified IO service type. This value is accumulated once every minute and the average is calculated for every transfer period. The value unit is in bytes.

**3.3.9.2 Register release history update**

The register is being created in CSP21 and patched back to CSP20.

**3.3.9.3 Associated registers**

None.

**3.3.9.4 Associated logs**

None.





# SN08 Feature Deltas

***Product = CS 2000***

## **A00006731--Handle Flash on Exit**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS

#### **1.2 Description**

On TMX100 switches, hook flash is only enabled on those RES lines that have flash features assigned. Most customers do not use flash features. RES customers without hook flash features who flash are treated as exiting the current call and receive standard dial tone allowing them to initiate a new call.

When TMX100 sites migrate to ISN04 or later, customers are converted from RES to IBN line functionality and by default have hook flash enabled and will get second dial tone if they Flash (go on/off hook) instead of Exit. This difference in behavior is causing confusion and customer complaints at the Coteor site in Bolivia, the first local exchange migrating from TMX100 to ISN04. Similar complaints are expected when other sites convert (100-150 sites).

The purpose of the Exit on Flash (EOF) option is to resolve these customer complaints and to provide for a more seamless migration from TMX100 to ISN04.

Customer requirement of this activity is to develop a new line option that treats Flash as EXIT for IBN lines.

#### **Without EOF:**

A Calls B

B Answers

A Flashes  
A gets Special Dial Tone  
A Calls C  
A Receives Feature Not Allowed (FNAL) treatment

**With EOF:**

A has EOF option  
A Calls B  
B Answers  
A Flashes  
A and B Disconnect  
A gets Dial Tone  
A calls C  
A to C call is established

This feature uses line option datafill. The advantages of offering this as a line option are:

- consistency with the current FIG (Flash Ignore) option
- ability to define option compatibilities using OPTOPT table

### 1.3 Hardware Requirements or Dependencies

There is no hardware dependency. The option can be added to any line with an LCC of IBN.

### 1.4 Software Requirements or Dependencies

None.

### 1.5 Limitations and restrictions

EOF feature is only applicable to IBN lines in NA and WT.

EOF feature is not compatible with the following options:

CHD, CNF, CWI, CWX, CWT, CXR, FXR, DCBX, HLD, LDSA, LDSO, LDSR, LDST, LNPTST, MPB, PCWT, PRK, 3WC, 3WCPUB, VOWDN.

### 1.6 Interactions

CWO and CWD compatible with EOF feature. If another agent imposes CWT on an agent with EOF, this agent still has the ability to flash to the waiting call and maintain the original call.

A has EOF option



A Calls B

B Answers

C with CWO/CWD calls A and imposes CWT on A

A Flashes

A to C call established while B is on hold

A flashes again and A to B call established while C is on hold

## 1.7 Applicable customer facing sections

### Fault Management

Logs

\_\_\_\_\_

Alarms

\_\_\_\_\_

### Configuration

Data Schema

\_\_\_X\_\_\_

User Interface

\_\_\_\_\_

Element Management

\_\_\_\_\_

Security

\_\_\_\_\_

Service Order

\_\_\_X\_\_\_

Office Parameters

\_\_\_\_\_

Accounting (includes AMA billing)

\_\_\_\_\_

Performance (includes operational measurements)

\_\_\_\_\_

## 2: Configuration for A00006731

### 2.1 Hardware and Software Requirements

There is no hardware or software dependencies.

### 2.2 Upgrade Impact

No impact on upgrades.

## 2.3 Data schema (DS) (CM, MIBS, RDB)

### 2.3.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------|--------------------------|------------------------------------|
| IBNLINES       | changed                  | unchanged                          |

### 2.3.2 Table/MIB/Remote Database Schema information

#### 2.3.2.1 Name: IBNLINES

IBN Line Assignment Table

##### 2.3.2.1.1 Functional description

Table IBNLINES contains the line assignments for each 500/2500 set assigned to an Integrated Business Network (IBN), Residential Enhanced Services (RES), and Multiple Appearance Directory Number (MADN) station number. This table also contains the line assignments for the IBN attendant consoles (AC).

##### 2.3.2.1.2 Usage sequence and implications (CM Only)

Current datafill order unchanged.

##### 2.3.2.1.3 Size

Unchanged.

##### 2.3.2.1.4 Fields/OIDs

The following table lists fields/OIDs for IBNLINES.

Table 2 Table field descriptions

| Field  | New or Changed | Subfield or refinement | Entry | Explanation and action                                                                        |
|--------|----------------|------------------------|-------|-----------------------------------------------------------------------------------------------|
| RESULT | Changed        | OPTLIST                | EOF   | Option List. Added EOF to OPTLIST as another line option. Enter EOF for Exit On Flash option. |

### 2.3.2.1.5 Datafill example

The following example shows sample datafill for table IBNLINES.

```
>table ibnlines
>list
LEN  DNNO  RESULT
-----
HOST 00 0 00 01 0 DT STN IBN 6210201 350 819_P621_2 L819_NILLA_2 819 (EOF) $
```

### 2.3.2.1.6 Table release history update

ISN08 - Feature (A00006731) Handle Flash on Exit adds new OPTLIST option EOF.

## 2.4 Service Orders (SO) (CM & SESM)

### 2.4.1 Service order change details

#### 2.4.1.1 LCC and options

New line option, EOF, can only be assigned to LCC of IBN.

Option EOF is not compatible with the following options and features:

CHD, CNF, CWI, CWX, CWT, CXR, FXR, DCBX, HLD, LDSA, LDSO, LDSR, LDST, LNPTST, MPB, PCWT, PRK, 3WC, 3WC PUB, VOWDN.

### 2.4.2 New commands

#### 2.4.2.1 How service order options are presented

##### 2.4.2.1.1 Description

The EOF option enables the subscriber on the assigned line to exit on flash.

### 2.4.2.1.2 Example

**Figure 1 Example of the EOF option in prompt mode**

```

SERVORD
SO:
>ado
SONUMBER:      NOW    4    1 14 PM
>
DN_OR_LEN:
>6137220110
OPTION:
>eof
OPTION:
>$
COMMAND AS ENTERED:
ADO NOW 4 1 14 PM 6137220110 ( EOF ) $
ENTER Y TO CONFIRM,N TO REJECT OR E TO EDIT
>Y
MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED
JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED
SHOULD ORDER BE DONE ANYWAY? (Y OR N)
>Y

```

**Figure 2 Example of the EOF option in no-prompt mode**

```

SERVORD
SO:
>ado $ 6137220110 eof $ Y Y

```

### 2.4.2.1.3 Option prompts

**Table 3 System prompts for EOF option**

| Prompt | Valid input | Description                           | Areas affected by prompt |
|--------|-------------|---------------------------------------|--------------------------|
| OPTION | EOF         | Assigns Exit On Flash feature to line | None                     |

### 2.4.2.1.4 Line class code compatibility

**Table 4 EOF compatibility to LCC**

| Line class code | Compatible? |
|-----------------|-------------|
| IBN             | Yes         |

### 2.4.2.1.5 Option prerequisites

EOF has no prerequisites

**2.4.2.1.6 Notes**

None.

**2.4.2.1.7 Feature identification**

Feature number: A00006731

***Product = CS 2000***

**A00006780--Trimodal Call Server OAM&P Enhancements*****Functional Description*****1.1 Applicable Solution(s)**

UA-IP, IAW, CHS

**1.2 Description**

Trimodal Call Server is a Nortel Networks Call Server which supports all the following three Bearer Network Fabric types: ATM, IP and TDM. It is a solution being provided by Nortel Networks to its customers who want to:

- Make a smooth transition from VoATM Carriers to a VoIP network solution.
- Move into the IP Space, leveraging the already existing ATM equipment at their premises.

This activity is in continuation of the Enhancements done in SN07 under the following ACTIDs:

- A00003487: Tri Modal Provisioning
- A00003947: Tri Modal Logs and OMs

The SN08 Trimodal Enhancements include:

- OAMP Enhancements
  - TRK2NET2 and TRK2NET1 OM tuple allocation enhancement.
  - Enhancements to include Bearer Network information on (a) SPM PM, Carrier and Perfmon MAPs (b) ABI XPM MAPs (c) GWC MAP (d) TTP, LTP MAPs and (e) DPT MAPs.
  - Enhancements to the Servord Query Commands QDN, QLEN, QLENWRK, QDNWRK, QHASU, QGRP, QLT and QCUST command outputs to include Bearer Network Information.

- When a tuple is added in table NETBRDGE, a Bridge Pool without members is allocated.
- Introduce restriction in the table NETBRDGE to the DISPLAY field contains unique and non-null values, as these values are used in the MAP display and query command enhancements.
- New table OFCVAR parameter OSS\_PROV\_VERSION is added to enable/disable the Servord Query Command enhancements.
- Tool QOSSVER is introduced to print out the list of activity IDs of features delivered in various loads which have OSS impact.

### 1.2.1 OMs Enhancement

TRK2NET2 and TRK2NET1 OM tuples are allocated for all bearer networks provisioned in table BEARNETS, for each Trunk Group datafilled in table TRKGRP i.e. even if there are no Trunk Members against the Trunk Group in a bearer network.

Details are captured in the Performance Management Document for the feature.

### 1.2.2 MAP Enhancements

The following MAP enhancements are implemented as a part of this feature.

- Posting of nodes on a Bearer Network basis
- Refining the trunk post set based on the bearer network
- Display of Bearer Network Information on (a) SPM PM, Carrier and Perfmon MAP displays, (b) ABI XPM MAP displays as a part of QUERYPM MENU command, (c) GWC MAP display as a part of QUERYPM MENU command (d) TTP CktInfo MENU command, (e) LTP MAP displays and (f) DPT MAP displays.
  - The value displayed in new display field “Bear” is picked up from the DISPLAY field of the table BEARNETS tuple corresponding to the Bearer Network.
  - The value displayed in new display field “Netbrdge” is picked up from the DISPLAY field of the table NETBRDGE tuple corresponding to the Bridge Pool CLLI of the Bridge Pool to which an IW SPM belongs.

#### Notes:

- Refresh of the MAP displays of a currently posted PM or Line does not automatically update when table BEARNETS or NETBRDGE is changed. Reposting the PM or line reflects the change.

### 1.2.2.1 PM MAP level enhancements

The enhancements at the MAPCI;MTC;PM level enable the user to do the following:

- To display all PMs associated with a bearer network. This is applicable to all packet node types including SPMs, GWCs and ABI hosted XPMs which are currently maintained from PM MAP level.
- To post SPM type nodes based on the associated bearer network and the SPM node class. The valid SPM node classes for this command are SMG4 and DPT.

**Note:** All enhancements/additions are displayed in **BOLD** in figures.

#### Enhancements to post command:

The following figure shows the enhancements to the post command at the PM level.

- The new option <BN> allows the query by bearer network datafilled in DISPLAY field of the table BEARNETS tuple for a bearer network.

**Note 1:** The Parms <PM Type> and the Parm <PM BEARNETS> cannot be used together.

**Note 2:** For the user inputs and the MAP responses please refer the Configuration Document for the feature (CN Document). For more information see “User interface changes” on page 92.

**Note 3:** The Bearer Networks displayed in the Parameter list for new option <BN> does not include Bearer Network for fabric=ENET.

**Figure 3 POST command with the new parameters**

```
Post:Post specified PMs for maintenance
Parms: [<All PMs> {AllPMs}]
      [<PM Type>... {TM2 [<All> {All}]}
      ....
      [<PM State>... {SysB,
      ....
      InSv}]
      [<PM Alarm>... {Minor,
      Major,
      Crit}]
      [<BN> {A1_P [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]}}]
      A1_S [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]}}],
      IP_P [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]}}],
      IP_S [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]}}]}}
```

#### QUERYPM command for ABI XPMs:

The querypm command for on posting a ABI XPM from the MAPCI;MTC;PM level is enhanced to display the bearer network of the GWC from where it subtends.

This enhancement is for PMs datafilled in the following tables: LTCINV, LTCRINV, RCCINV, LCMINV, RDTINV, LGRPINV, SERVINV (except DPT GWCs) and RMMINV. Also the QueryPM command of ESA nodes has been enhanced to display Bearer Network information.

E.g., Datafill from Table LTCINV for an ABI hosted XPM:

```
SMA2 4 62 MVDD 1 57 21 R 21 MX85AB XM220CE (POTS POTSEX) (KEYSET KSETEX)
$ (4 16) (4 17) (4 18) (4 19) $ (UTR6 ) (MSGMX76 HOST ) (ISP 4) $
NORTHAA AX74AA AX74AA 0 NILLOAD ( EXTDS512 HOST ABI 5 ) $ 6X40FB N
```

**Figure 4 QueryPM enhancements for LTC**

```
>mapci nodisp prtmap;mtc;pm;post LTC 1
>querypm
PM Type: LTC PM No.: 1 PM Int. No.: 6 Node_No.: 149
PMs Equipped: 113 Loadname: QLI20CE EEPROM Load: SXFWAJ02
WARM SWACT is supported but not possible: node redundancy lost.
LTC 1 is included in the REX schedule.
REX on LTC 1 has not been performed.
Node Status: {OFFLINE, TRUE}
Unit 0 Status: {OFFLINE, TRUE}
Unit 1 Status: {OFFLINE, TRUE}
Site Flr RPos Bay_id Shf Description Slot EqPEC
VOIP 01 AA05 LTEI 018 18 LTC : 001 6X02NA
MG9K Information:
HOST 01 MM04 MG9F 004 02 ABI : 0006 20/21 042 172.31.165.18
Bearer Network: IP_P
```

**Figure 5 QueryPM enhancements for LCME**

```
>post LCME HOST 2 0;querypm
PM:
POST:
PM Type: LCME Int. No.: 2 Status index: 1 Node_No: 107
LCME HOST 02 0 Memory Size - Unit 0: 256K , Unit 1: 256K
Loadnames: LCMINV - LCME18AW
LCM REX is ON; Not run since last Reload Restart.
Node Status: {OFFLINE, TRUE}
Unit 0 Status: {OFFLINE, TRUE} /RG: 0
Unit 1 Status: {OFFLINE, TRUE} /RG: 0
Ring Generator Status:
RG 0 Status: {OK} Preferred
RG 1 Status: {OK} Standby
RG in Overload : NO
Site Flr RPos Bay_id Shf Description Slot EqPEC
HOST 01 N25 LCEI 02 38 LCME 02 0 BX30AB
Services : ISDN Equipped
MG9K Information:
Bearer Network: A1_P
```



**Figure 6 QueryPM enhancements for RCS**

```
>querypm
PM Type: RCS Int. No.: 15 Node_No: 169
Site Flr RPos Bay_id Shf Description Slot EqPEC
SLC 01 K31 RTS 000 58 RCS 00 0
MG9K Information:
Bearer Network: IP_P
```

**Figure 7 QueryPM enhancements for RCC**

```
>querypm
PM Type: RCC Int. No.: 15 Node_No: 169
Site Flr RPos Bay_id Shf Description Slot EqPEC
SLC 01 K31 RTS 000 58 RCS 00 0
MG9K Information:
Bearer Network: A1_P
```

**Figure 8 QueryPM enhancements for IDT**

```
PM Type: IDT Int. No: 56 Status index: 0 Node No: 110
Prot-Switch: Unavailable
Cside Host Name: SMA2 4
RDT Name: RDT1 23 0
Network element: 12 ANODE_2_CUFED
Lines allocated to IDT 23: 671
Lines defined for SMA2 4: 671
Lines available to SMA2 4: 4705
MG9K Information:
Bearer Network: A1_P
```

**Figure 9 QueryPM enhancements for LGRP**

```
PM Type:LGRP Node No:150 Int.No:0 Off.LM:18 Type:S
Cside Host: GWC 0 Node_No: 89 IP: 47.142.92.68
Node_Status MTC_Node_Status Callp_Node_Status
{OFFL FALSE} {OFFL FALSE} {OFFL FALSE}
Site Flr RPos Bay_id Shf Description
HOST 1 A 1 MG9F 1 3 LGRP 1 3
Node Information:
Bearer Network: A1_P
```

**Figure 10 QueryPM enhancements for ESA**

```
PM Type: ESA PM No.: 0 PM Int. No.: 0 Node_No.: 110
PMs Equipped: 79 Loadname: ESA10AQ
NODE STATUS: {OFFLINE, TRUE}
Site Flr RPos Bay_id Shf Description Slot EqPEC
RLCM 01 N15 RLCM 00 00 ESA : 000
MG9K Information:
Bearer Network: A1_P
```

**Figure 11 QueryPM enhancements for RMM**

```

PM TYPE: RMM PM NO.: 0 NODE NO.: 105
PM_STATUS: Offl NODE_STATUS: OFFLINE,TRUE, CHKSUM: #BDB0
PP LOAD: VALID PP EXECS: VALID FNAME: RMM10A
PMS EQUIPPED: 79 PM INT. #: 3
  Site Flr RPos Bay_id Shf Description Slot EqpEC
USMA 01 D39 MIS 000 65 RMM : 000 6X13AA
TM Entries: 0 TO 10
MG9K Information:
  Bearer Network: AAL1

```

**QUERYPM command for GWCs:**

The querypm command is on posting a GWCs from the MAPCI;MTC;PM level is enhanced to display the bearer network it supports under Node Information. For DPT GWCs, the message “Signaling Only - No Associated Bearer Network” is displayed.

E.g., Datafill from Table SERVINV for GWCs.

```

GWC 0 IP 47 142 92 68 (POTS POTSEX) (KEYSET KSETEX) $ NORTHAA
(AAL1_PRIMARY Y) $ $
GWC 19 IP 47 142 92 148 (ABTRK GWCEX) $ NORTHAM $ $

```

**Figure 12 QueryPM enhancements for GWCs**

```

>mapci;mtc;pm;post gwc 0
>querypm
PM Type: GWC PM No.: 0 PM Int. No.: 0 Node_No.: 89
IP Address: 47.142.92.68
Unit 0:
  Load: GN080BK
Unit 1:
  Load: GN080BK
Node Information:
  Bearer Network: A1_P

```

**Figure 13 QueryPM enhancement for DPT GWCs**

```

>querypm
PM Type: GWC PM No.: 19 PM Int. No.: 19 Node_No.: 199
IP Address: 47.142.92.148
Unit 0:
  Load: GN080BK
Unit 1:
  Load: UNKNOWN
Node Information:
  Bearer Network: Signaling Only - No Associated Bearer Network

```

**1.2.2.2 Enhancements to SPM MAP display (mapci;mtc;pm;post spm <spm no>)****Enhancements to Non-Menu POSTCLS command:**

To post SPM type nodes based on the SPM node class. In case of IW SPM (Bridge \_only Type), nodes are posted based on their associated bridge pool.

The following figure shows the enhancements to the post command at the PM level.

- Enhancements to the existing command POSTCLS.
  - To Post the IW DPT SPMs
  - To POST IW SPMs associated with a specific Bridge Pool CLLI. Parameters which are passed to POSTCLS command are linked to the values datafilled in DISPLAY field of table NETBRDGE tuples.

**Note:** For the user inputs and the MAP responses please refer the Configuration Document for the feature (CN Document). For more information see “User interface changes” on page 92.

**Figure 14 POSTCLS command Enhancements**

```
POSTCLS: Post SPM by CLASS for maintenance.
Parms: <Class Type> {DMSCP,
                  IWBRG [<Netbridge_clli>...{E_A1,E_A2}]
                  SMG4,
                  IWDPT};
```

### MAP Display for DMSCP/SMG4/IW DPT SPM node types:

Below are the MAP displays for a) DMSCP SPM b)SMG4 SPM c) IW DPT SPM. The DISPLAY field of the bearer network of the SPM node as datafilled in table BEARNETS is displayed in the new field “Bear”.

**Figure 15 PM MAP display for DMSCP node**

| XAC         | MS         | IOD       | Net         | PM                  | CCS   | Lns       | Trks  | Ext               | APPL  |
|-------------|------------|-----------|-------------|---------------------|-------|-----------|-------|-------------------|-------|
| AMDI        | Istb       | NODLOG    | .           | 3 SPM               | .     | SYSB      | 69C.. | .                 | ATM_6 |
| M           |            |           |             | *C*                 |       | *C*       | *C*   |                   | *C*   |
| SPM         |            |           |             | SysB                | ManB  | OffL      | CBsy  | ISTb              | InSv  |
| 0 Quit      |            | PM        |             | 4                   | 1     | 52        | 2     | 6                 | 48    |
| 2 Post_     |            | SPM       |             | 0                   | 0     | 6         | 0     | 3                 | 4     |
| 3 ListSet   |            |           |             |                     |       |           |       |                   |       |
| 4 ListRes   | <b>SPM</b> | <b>8</b>  | <b>ISTb</b> | Class: <b>DMSCP</b> |       |           |       | BEAR: <b>ENET</b> |       |
| 5 Trnsl     |            |           |             |                     |       |           |       |                   |       |
| 6           | Shlf0      | SL A Stat | Shlf0       | SL A Stat           | Shlf1 | SL A Stat | Shlf1 | SL A Stat         |       |
| 7 ATMConn   | -----      | 1 - ----  | CEM 1       | 8 A ISTb            | DLC 0 | 1 A InSv  | ----- | 8 - ----          |       |
| 8 IPConn    | -----      | 2 - ----  | OC3 0       | 9 A InSv            | DLC 1 | 2 I OffL  | ----- | 9 - ----          |       |
| 9 OfClk     | -----      | 3 - ----  | OC3 1       | 10 I InSv           | ----- | 3 - ----  | ----- | 10 - ----         |       |
| 10          | -----      | 4 - ----  | -----       | 11 - ----           | ----- | 4 - ----  | DSP 1 | 11 A InSv         |       |
| 11 Disp_    | -----      | 5 - ----  | VSP 0       | 12 I OffL           | DSP 0 | 5 I InSv  | ----- | 12 - ----         |       |
| 12 Next     | -----      | 6 - ----  | VSP 1       | 13 A InSv           | ----- | 6 - ----  | ----- | 13 - ----         |       |
| 13 Select_  | CEM 0      | 7 I ISTb  | -----       | 14 - ----           | ----- | 7 - ----  | ----- | 14 - ----         |       |
| 14 QueryPM  |            |           |             |                     |       |           |       |                   |       |
| 15 ListAlm  | POST:      |           |             |                     |       |           |       |                   |       |
| 16 Clock    | SPM:       |           |             |                     |       |           |       |                   |       |
| 17 SPERFORM |            |           |             |                     |       |           |       |                   |       |
| 18 Upgrade_ |            |           |             |                     |       |           |       |                   |       |
| ADMIN       |            |           |             |                     |       |           |       |                   |       |

**Figure 16 PM MAP display for SMG4 node**

| XAC         | MS         | IOD      | Net         | PM                 | CCS       | Lns   | Trks              | Ext   | APPL      |
|-------------|------------|----------|-------------|--------------------|-----------|-------|-------------------|-------|-----------|
| AMDI        | Istb       | NODLOG   | .           | 3 SPM              | .         | SYSB  | 68C..             | .     | ATM_6     |
| M           |            |          |             | *C*                |           | *C*   | *C*               |       | *C*       |
| SPM         |            |          |             | SysB               | ManB      | OffL  | CBsy              | ISTb  | InSv      |
| 0 Quit      |            | PM       |             | 4                  | 1         | 52    | 2                 | 6     | 48        |
| 2 Post_     |            | SPM      |             | 0                  | 0         | 6     | 0                 | 3     | 4         |
| 3 ListSet   |            |          |             |                    |           |       |                   |       |           |
| 4 ListRes   | <b>SPM</b> | <b>0</b> | <b>OffL</b> | Class: <b>SMG4</b> |           |       | BEAR: <b>A1_P</b> |       |           |
| 5 TrnsL     |            |          |             |                    |           |       |                   |       |           |
| 6           |            | Shlf0    | SL A Stat   | Shlf0              | SL A Stat | Shlf1 | SL A Stat         | Shlf1 | SL A Stat |
| 7 ATMConn   | ATM 0      | 1 I      | OffL        | CEM 1              | 8 I       | OffL  | -----             | 1 -   | -----     |
| 8 IPConn    | ATM 1      | 2 I      | OffL        | OC3 0              | 9 I       | OffL  | -----             | 2 -   | -----     |
| 9 OfClk     | -----      | 3 -      | -----       | OC3 1              | 10 I      | OffL  | -----             | 3 -   | -----     |
| 10          | -----      | 4 -      | -----       | VSP 1              | 11 I      | OffL  | VSP 0             | 4 I   | OffL      |
| 11 Disp_    | -----      | 5 -      | -----       | VSP 2              | 12 I      | OffL  | VSP 6             | 5 I   | OffL      |
| 12 Next     | -----      | 6 -      | -----       | VSP 3              | 13 I      | OffL  | -----             | 6 -   | -----     |
| 13 Select_  | CEM 0      | 7 A      | OffL        | VSP 4              | 14 I      | OffL  | -----             | 7 -   | -----     |
| 14 QueryPM  |            |          |             |                    |           |       |                   |       |           |
| 15 ListAlm  | POST:      |          |             |                    |           |       |                   |       |           |
| 16 Clock    | SPM:       |          |             |                    |           |       |                   |       |           |
| 17 SPERFORM |            |          |             |                    |           |       |                   |       |           |
| 18 Upgrade_ |            |          |             |                    |           |       |                   |       |           |
| ADMIN       |            |          |             |                    |           |       |                   |       |           |

**Figure 17 PM MAP display for IW DPT node**

| XAC         | MS         | IOD      | Net         | PM               | CCS       | Lns   | Trks            | Ext               | APPL      |
|-------------|------------|----------|-------------|------------------|-----------|-------|-----------------|-------------------|-----------|
| .           | .          | NO AMA   | .           | 2 SPM            | 3 RS      | .     | 34C..           | .                 | SPM_26    |
|             |            | *C*      |             | *C*              | *C*       |       | *C*             |                   | M         |
| SPM         |            |          |             | SysB             | ManB      | OffL  | CBsy            | ISTb              | InSv      |
| 0 Quit      |            | PM       |             | 5                | 0         | 6     | 0               | 10                | 19        |
| 2 Post_     |            | SPM      |             | 0                | 0         | 4     | 0               | 7                 | 6         |
| 3 ListSet   |            |          |             |                  |           |       |                 |                   |           |
| 4 ListRes   | <b>SPM</b> | <b>1</b> | <b>InSv</b> | Class: <b>IW</b> |           |       | <b>DPT_Only</b> | BEAR: <b>AAL1</b> |           |
| 5 TrnsL     |            |          |             |                  |           |       |                 |                   |           |
| 6           |            | Shlf0    | SL A Stat   | Shlf0            | SL A Stat | Shlf1 | SL A Stat       | Shlf1             | SL A Stat |
| 7 ATMConn   | -----      | 1 -      | -----       | CEM 1            | 8 I       | InSv  | -----           | 1 -               | -----     |
| 8 IPConn    | -----      | 2 -      | -----       | ATM 0            | 9 A       | InSv  | -----           | 2 -               | -----     |
| 9 OfClk     | -----      | 3 -      | -----       | ATM 1            | 10 I      | InSv  | -----           | 3 -               | -----     |
| 10          | -----      | 4 -      | -----       | -----            | 11 -      | ----- | VSP 0           | 4 A               | InSv      |
| 11 Disp_    | -----      | 5 -      | -----       | -----            | 12 -      | ----- | DSP 0           | 5 A               | InSv      |
| 12 Next     | -----      | 6 -      | -----       | -----            | 13 -      | ----- | VSP 1           | 6 A               | InSv      |
| 13 Select_  | CEM 0      | 7 A      | InSv        | -----            | 14 -      | ----- | -----           | 7 -               | -----     |
| 14 QueryPM  | Next       |          |             |                  |           |       |                 |                   |           |
| 15 ListAlm  |            |          |             |                  |           |       |                 |                   |           |
| 16 Clock    |            |          |             |                  |           |       |                 |                   |           |
| 17 SPERFORM |            |          |             |                  |           |       |                 |                   |           |
| 18 Upgrade_ |            |          |             |                  |           |       |                 |                   |           |
| ADMIN       |            |          |             |                  |           |       |                 |                   |           |

**MAP Display for IW bridge\_only SPM node:**

Below is the display of a IW bridge only SPM node. The value datafilled in DISPLAY field of the table NETBRDGE tuple corresponding to the NetBridge CLI of the SPM node is displayed in the new field “Netbridge”.

**Figure 18 PM MAP display for IW bridge only node**

|             |            |          |             |                  |                 |                       |           |       |           |
|-------------|------------|----------|-------------|------------------|-----------------|-----------------------|-----------|-------|-----------|
| XAC         | MS         | IOD      | Net         | PM               | CCS             | Lns                   | Trks      | Ext   | APPL      |
| AMDI        | Istb       | NODLOG   | .           | 3 SPM            | .               | SYSB                  | 69C..     | .     | ATM_6     |
| M           |            |          |             | *C*              |                 | *C*                   | *C*       |       | *C*       |
| SPM         |            |          |             | SysB             | ManB            | OffL                  | CBsy      | ISTb  | InSv      |
| 0 Quit      |            | PM       |             | 4                | 1               | 52                    | 2         | 5     | 49        |
| 2 Post_     |            | SPM      |             | 0                | 0               | 6                     | 0         | 3     | 4         |
| 3 ListSet   |            |          |             |                  |                 |                       |           |       |           |
| 4 ListRes   | <b>SPM</b> | <b>3</b> | <b>InSv</b> | <b>Class: IW</b> | <b>BRG_Only</b> | <b>NETBRDGE: E_AP</b> |           |       |           |
| 5 Trnsl     |            |          |             |                  |                 |                       |           |       |           |
| 6           |            | Shlfo    | SL A Stat   | Shlfo            | SL A Stat       | Shlfl                 | SL A Stat | Shlfl | SL A Stat |
| 7 ATMConn   | -----      | 1 -      | -----       | CEM 1            | 8 A InSv        | -----                 | 1 -       | ----- | 8 -       |
| 8 IPConn    | -----      | 2 -      | -----       | ATM 0            | 9 A InSv        | -----                 | 2 -       | ----- | 9 -       |
| 9 OfClk     | -----      | 3 -      | -----       | ATM 1            | 10 I InSv       | -----                 | 3 -       | VSP 6 | 10 A InSv |
| 10          | -----      | 4 -      | -----       | VSP 0            | 11 A InSv       | VSP 4                 | 4 A InSv  | VSP 7 | 11 A InSv |
| 11 Disp_    | -----      | 5 -      | -----       | VSP 1            | 12 A InSv       | DSP 2                 | 5 A InSv  | VSP 8 | 12 I InSv |
| 12 Next     | -----      | 6 -      | -----       | VSP 2            | 13 A InSv       | DSP 3                 | 6 A InSv  | DSP 0 | 13 A InSv |
| 13 Select_  | CEM 0      | 7 I InSv | VSP 3       | 14 A InSv        | -----           | 7 -                   | -----     | DSP 1 | 14 I InSv |
| 14 QueryPM  | Next       |          |             |                  |                 |                       |           |       |           |
| 15 ListAlm  |            |          |             |                  |                 |                       |           |       |           |
| 16 Clock    |            |          |             |                  |                 |                       |           |       |           |
| 17 SPERFORM |            |          |             |                  |                 |                       |           |       |           |
| 18 Upgrade_ |            |          |             |                  |                 |                       |           |       |           |
| ADMIN       |            |          |             |                  |                 |                       |           |       |           |

### 1.2.2.3 Enhancements to CARRIER MAP display

The CARRIER level of MAPCI is enhanced for SPM PMs to display the SPM node type and the Bearer Network or Network Bridge Information as appropriate.

In the case of DMSCP, SMG4 and IW DPT node types, the additional information displayed is the SPM node class type and the value datafilled in DISPLAY field of the table BEARNETS tuple corresponding to the Bearer Network associated with the node.

In the case of Bridge Only IW nodes, the additional information displayed is the SPM node class type and the value datafilled in DISPLAY field of the table NETBRDGE corresponding to the bridge pool CLI with which the IW SPM is associated.

**Figure 19 Carrier MAP display for DMSCP**

|             |                    |                        |      |       |      |      |       |      |         |      |      |
|-------------|--------------------|------------------------|------|-------|------|------|-------|------|---------|------|------|
| XAC         | MS                 | IOD                    | Net  | PM    | CCS  | Lns  | Trks  | Ext  | APPL    |      |      |
| AMDI        | Istb               | NODLOG                 | .    | 3 SPM | .    | SYSB | 69C.. | .    | ATM_6   |      |      |
| M           |                    |                        |      | *C*   |      | *C*  | *C*   |      | *C*     |      |      |
| POST        | CLASS              | ML                     | OS   | ALRM  | SYSB | MANB | UNEQ  | OFFL | CBSY    | PBSY | INSV |
| 0 Quit      | TRUNKS             | 75                     | 0    | 0     | 0    | 0    | 0     | 527  | 0       | 0    | 89   |
| 2 Post_     | REMOTE             | 0                      | 0    | 0     | 0    | 0    | 0     | 42   | 0       | 0    | 0    |
| 3           | PROTLN             | 0                      | 0    | 0     | 0    | 0    | 0     | 3    | 0       | 0    | 0    |
| 4           | HSCARR             | 85                     | 0    | 0     | 0    | 0    | 0     | 545  | 0       | 0    | 95   |
| 5 Loop_     | OC3S               | Type: DMSCP Bear: ENET |      |       |      |      |       |      |         |      |      |
| 6 Tst_      | N CLASS            | SITE                   | SPM  | RM    | OC3S | CKT  | STATE | TR   | MA      |      |      |
| 7 Bsy_      | 0                  | HSCARR                 | HOST | 8     | 0    | 0    | 169   | OFFL | --      | --   |      |
| 8 RTS_      | 1                  | HSCARR                 | HOST | 8     | 1    | 0    | 170   | OFFL | --      | --   |      |
| 9 Offl_     |                    |                        |      |       |      |      |       |      |         |      |      |
| 10          |                    |                        |      |       |      |      |       |      |         |      |      |
| 11 Disp_    |                    |                        |      |       |      |      |       |      |         |      |      |
| 12 Next     | SIZE OF POSTED SET | :                      | 175  |       |      |      |       |      | MORE... |      |      |
| 13          |                    |                        |      |       |      |      |       |      |         |      |      |
| 14 Detail_  | POST:              |                        |      |       |      |      |       |      |         |      |      |
| 15 ListAlm_ |                    |                        |      |       |      |      |       |      |         |      |      |
| 16          |                    |                        |      |       |      |      |       |      |         |      |      |
| 17 Perfmon_ |                    |                        |      |       |      |      |       |      |         |      |      |
| 18          |                    |                        |      |       |      |      |       |      |         |      |      |
| ADMIN       |                    |                        |      |       |      |      |       |      |         |      |      |

**Figure 20 Carrier MAP display for SMG4**

|             |      |                          |                       |       |      |      |       |       |         |      |      |      |
|-------------|------|--------------------------|-----------------------|-------|------|------|-------|-------|---------|------|------|------|
| XAC         | MS   | IOD                      | Net                   | PM    | CCS  | Lns  | Trks  | Ext   | APPL    |      |      |      |
| AMDI        | Istb | NODLOG                   | .                     | 3 SPM | .    | SYSB | 69C.. | .     | ATM_6   |      |      |      |
| M           |      |                          |                       | *C*   |      | *C*  | *C*   |       | *C*     |      |      |      |
| POST        |      | CLASS                    | ML                    | OS    | ALRM | SYSB | MANB  | UNEQ  | OFFL    | CBSY | PBSY | INSV |
| 0 Quit      |      | TRUNKS                   | 75                    | 0     | 0    | 0    | 0     | 0     | 527     | 0    | 0    | 89   |
| 2 Post_     |      | REMOTE                   | 0                     | 0     | 0    | 0    | 0     | 0     | 42      | 0    | 0    | 0    |
| 3           |      | PROTLN                   | 0                     | 0     | 0    | 0    | 0     | 0     | 3       | 0    | 0    | 0    |
| 4           |      | HSCARR                   | 85                    | 0     | 0    | 0    | 0     | 0     | 545     | 0    | 0    | 95   |
| 5 Loop_     |      | OC3S                     | Type: SMG4 Bear: A1_P |       |      |      |       |       |         |      |      |      |
| 6 Tst_      | N    | CLASS                    | SITE                  | SPM   | RM   | OC3S | CKT   | STATE | TR      | MA   |      |      |
| 7 Bsy_      | 0    | HSCARR                   | HOST                  | 0     | 0    | 0    | 1     | OFFL  | --      | --   |      |      |
| 8 RTS_      | 1    | HSCARR                   | HOST                  | 0     | 1    | 0    | 2     | OFFL  | --      | --   |      |      |
| 9 Offl_     | 2    | HSCARR                   | HOST                  | 0     | 0    | 0    | 176   | OFFL  | --      | --   |      |      |
| 10          | 3    | HSCARR                   | HOST                  | 0     | 1    | 0    | 177   | OFFL  | --      | --   |      |      |
| 11 Disp_    |      |                          |                       |       |      |      |       |       |         |      |      |      |
| 12 Next     |      | SIZE OF POSTED SET : 180 |                       |       |      |      |       |       | MORE... |      |      |      |
| 13          |      |                          |                       |       |      |      |       |       |         |      |      |      |
| 14 Detail_  |      | POST:                    |                       |       |      |      |       |       |         |      |      |      |
| 15 ListAlm_ |      |                          |                       |       |      |      |       |       |         |      |      |      |
| 16          |      |                          |                       |       |      |      |       |       |         |      |      |      |
| 17 Perfmon_ |      |                          |                       |       |      |      |       |       |         |      |      |      |
| 18          |      |                          |                       |       |      |      |       |       |         |      |      |      |
| ADMIN       |      |                          |                       |       |      |      |       |       |         |      |      |      |

**Figure 21 Carrier MAP display for IW DPT SPM**

| XAC         | MS | IOD                    | Net                         | PM      | CCS  | Lns  | Trks  | Ext     | APPL           |
|-------------|----|------------------------|-----------------------------|---------|------|------|-------|---------|----------------|
| .           | .  | NO AMA                 | .                           | 2 SPM   | 3 RS | .    | 34C.. | .       | SPM_26         |
|             |    | *C*                    |                             | *C*     | *C*  |      | *C*   |         | M              |
| POST        |    | CLASS                  | ML                          | OS ALRM | SYSB | MANB | UNEQ  | OFFL    | CBSY PBSY INSV |
| 0 Quit      |    | TRUNKS                 | 0                           | 0       | 0    | 0    | 0     | 477     | 0 0 618        |
| 2 Post_     |    | HSCARR                 | 0                           | 0       | 1    | 0    | 0     | 503     | 0 0 692        |
| 3           |    | OC3S                   | <b>Type: DPT Bear: AAL1</b> |         |      |      |       |         |                |
| 4           |    | N CLASS                | SITE                        | SPM RM  | OC3S | CKT  | STATE | TR MA   |                |
| 5 Loop_     |    | 0 HSCARR               | HOST                        | 1 0     | 0    | 1    | INSV  | .. ..   |                |
| 6 Tst_      |    | 1 HSCARR               | HOST                        | 1 1     | 0    | 2    | INSV  | .S ..   |                |
| 7 Bsy_      |    |                        |                             |         |      |      |       |         |                |
| 8 RTS_      |    |                        |                             |         |      |      |       |         |                |
| 9 Offl_     |    |                        |                             |         |      |      |       |         |                |
| 10          |    | SIZE OF POSTED SET : 5 |                             |         |      |      |       | MORE... |                |
| 11 Disp_    |    |                        |                             |         |      |      |       |         |                |
| 12 Next     |    | POST:                  |                             |         |      |      |       |         |                |
| 13          |    |                        |                             |         |      |      |       |         |                |
| 14 Detail_  |    |                        |                             |         |      |      |       |         |                |
| 15 ListAlm_ |    |                        |                             |         |      |      |       |         |                |
| 16          |    |                        |                             |         |      |      |       |         |                |
| 17 Perfmon_ |    |                        |                             |         |      |      |       |         |                |
| 18          |    |                        |                             |         |      |      |       |         |                |
|             |    | ADMIN                  |                             |         |      |      |       |         |                |

**Figure 22 Carrier MAP display for IW DPT SPM On Next Command**

| XAC         | MS | IOD                    | Net                         | PM      | CCS  | Lns   | Trks  | Ext     | APPL           |
|-------------|----|------------------------|-----------------------------|---------|------|-------|-------|---------|----------------|
| .           | .  | NO AMA                 | .                           | 2 SPM   | 3 RS | .     | 34C.. | .       | .              |
|             |    | *C*                    |                             | *C*     | *C*  |       | *C*   |         |                |
| POST        |    | CLASS                  | ML                          | OS ALRM | SYSB | MANB  | UNEQ  | OFFL    | CBSY PBSY INSV |
| 0 Quit      |    | TRUNKS                 | 0                           | 0       | 0    | 0     | 0     | 477     | 0 0 618        |
| 2 Post_     |    | HSCARR                 | 0                           | 0       | 1    | 0     | 0     | 503     | 0 0 692        |
| 3           |    | STS3L                  | <b>Type: DPT Bear: AAL1</b> |         |      |       |       |         |                |
| 4           |    | N CLASS                | SITE                        | SPM RM  | OC3S | STS3L | CKT   | STATE   | TR MA          |
| 5 Loop_     |    | 0 HSCARR               | HOST                        | 1 0     | 0    | 0     | 3     | INSV    | .. ..          |
| 6 Tst_      |    | 1 HSCARR               | HOST                        | 1 1     | 0    | 0     | 4     | INSV    | .S ..          |
| 7 Bsy_      |    |                        |                             |         |      |       |       |         |                |
| 8 RTS_      |    |                        |                             |         |      |       |       |         |                |
| 9 Offl_     |    |                        |                             |         |      |       |       |         |                |
| 10          |    | SIZE OF POSTED SET : 3 |                             |         |      |       |       | MORE... |                |
| 11 Disp_    |    | next                   |                             |         |      |       |       |         |                |
| 12 Next     |    |                        |                             |         |      |       |       |         |                |
| 13          |    |                        |                             |         |      |       |       |         |                |
| 14 Detail_  |    |                        |                             |         |      |       |       |         |                |
| 15 ListAlm_ |    |                        |                             |         |      |       |       |         |                |
| 16          |    |                        |                             |         |      |       |       |         |                |
| 17 Perfmon_ |    |                        |                             |         |      |       |       |         |                |
| 18          |    |                        |                             |         |      |       |       |         |                |
|             |    | ADMIN                  |                             |         |      |       |       |         |                |

**Carrier MAP Display for IW bridge only SPM node:**

Below is the carrier level map display of a IW bridge only SPM node. The Class of the SPM Node and the value datafilled in DISPLAY field of table NETBRDGE tuple corresponding to the Bridge Pool CLLI with which the SPM node is associated, are displayed in the new fields 'Type' and 'Netbridge'.

**Figure 23 Carrier MAP display for IW Bridge only SPM**

|             |    |                    |      |       |      |      |       |       |         |
|-------------|----|--------------------|------|-------|------|------|-------|-------|---------|
| XAC         | MS | IOD                | Net  | PM    | CCS  | Lns  | Trks  | Ext   | APPL    |
| Split       | .  | NODLOG             | .    | 2 SPM | .    | SYSB | 55C.. | .     | SDM     |
|             |    |                    |      | *C*   |      | *C*  | *C*   |       |         |
|             |    | CLASS              | ML   | OS    | ALRM | SYSB | MANB  | UNEQ  | OFFL    |
| 0 Quit      |    | TRUNKS             | 4    | 0     | 4    | 0    | 0     | 0     | 81      |
| 2 Post_     |    | REMOTE             | 2    | 0     | 2    | 0    | 0     | 0     | 35      |
| 3           |    | PROTLN             | 0    | 0     | 0    | 0    | 0     | 0     | 3       |
| 4           |    | HSCARR             | 0    | 0     | 3    | 0    | 0     | 0     | 32      |
| 5 Loop_     |    | OC3S               |      |       |      |      |       |       |         |
| 6 Tst_      |    | N CLASS            | SITE | SPM   | RM   | OC3S | CKT   | STATE | TR MA   |
| 7 Bsy_      |    | 0 HSCARR           | HOST | 3     | 0    | 0    | 1     | INSV  | .. ..   |
| 8 RTS_      |    | 1 HSCARR           | HOST | 3     | 1    | 0    | 2     | INSV  | .S ..   |
| 9 Offl_     |    |                    |      |       |      |      |       |       |         |
| 10          |    |                    |      |       |      |      |       |       |         |
| 11 Disp_    |    |                    |      |       |      |      |       |       |         |
| 12 Next     |    | SIZE OF POSTED SET | :    | 5     |      |      |       |       | MORE... |
| 13          |    |                    |      |       |      |      |       |       |         |
| 14 Detail_  |    |                    |      |       |      |      |       |       |         |
| 15 ListAlm_ |    |                    |      |       |      |      |       |       |         |
| 16          |    |                    |      |       |      |      |       |       |         |
| 17 Perfmon_ |    |                    |      |       |      |      |       |       |         |
| 18          |    |                    |      |       |      |      |       |       |         |
| ADMIN       |    |                    |      |       |      |      |       |       |         |



**Figure 24 Carrier MAP display for IW Bridge only SPM On Next Command**

| XAC         | MS                     | IOD                      | Net | PM    | CCS  | Lns   | Trks  | Ext     | APPL  |      |      |
|-------------|------------------------|--------------------------|-----|-------|------|-------|-------|---------|-------|------|------|
| AMDI        | Istb                   | NODLOG                   | .   | 3 SPM | .    | SYSB  | 69C.. | .       | ATM_6 |      |      |
| M           |                        |                          |     | *C*   |      | *C*   | *C*   |         | *C*   |      |      |
| POST        | CLASS                  | ML                       | OS  | ALRM  | SYSB | MANB  | UNEQ  | OFFL    | CBSY  | PBSY | INSV |
| 0 Quit      | TRUNKS                 | 75                       | 0   | 0     | 0    | 0     | 0     | 527     | 0     | 0    | 89   |
| 2 Post_     | REMOTE                 | 0                        | 0   | 0     | 0    | 0     | 0     | 42      | 0     | 0    | 0    |
| 3           | PROTLN                 | 0                        | 0   | 0     | 0    | 0     | 0     | 3       | 0     | 0    | 0    |
| 4           | HSCARR                 | 0                        | 0   | 0     | 0    | 0     | 0     | 545     | 0     | 0    | 95   |
| 5 Loop_     | STS3L                  | Type: IW Netbridge: E_AP |     |       |      |       |       |         |       |      |      |
| 6 Tst_      | N CLASS                | SITE                     | SPM | RM    | OC3S | STS3L | CKT   | STATE   | TR    | MA   |      |
| 7 Bsy_      | 0 HSCARR               | HOST                     | 3   | 0     | 0    | 0     | 3     | OFFL    | --    | --   |      |
| 8 RTS_      | 1 HSCARR               | HOST                     | 3   | 1     | 0    | 0     | 4     | OFFL    | --    | --   |      |
| 9 Offl_     |                        |                          |     |       |      |       |       |         |       |      |      |
| 10          |                        |                          |     |       |      |       |       |         |       |      |      |
| 11 Disp_    |                        |                          |     |       |      |       |       |         |       |      |      |
| 12 Next     | SIZE OF POSTED SET : 3 |                          |     |       |      |       |       | MORE... |       |      |      |
| 13          | next                   |                          |     |       |      |       |       |         |       |      |      |
| 14 Detail_  |                        |                          |     |       |      |       |       |         |       |      |      |
| 15 ListAlm_ |                        |                          |     |       |      |       |       |         |       |      |      |
| 16          |                        |                          |     |       |      |       |       |         |       |      |      |
| 17 Perfmon_ |                        |                          |     |       |      |       |       |         |       |      |      |
| 18          |                        |                          |     |       |      |       |       |         |       |      |      |
| ADMIN       |                        |                          |     |       |      |       |       |         |       |      |      |

**1.2.2.4 Enhancements to CARRIER PERFMON MAP display**

The CARRIER/PERFMON level of the MAP is enhanced for SPM PMs to display the SPM node type and the Bearer Network or Network Bridge Information as appropriate.

In the case of DMSCP, SMG4 and IW DPT node types, the additional information displayed is the SPM node class type and the value datafilled in the DISPLAY field of the table BEARNETS tuple corresponding to the Bearer Network associated with the node.

In the case of IW Bridge nodes, the additional information displayed is the SPM node type and the value datafilled in the DISPLAY field in table NETBRDGE corresponding to the Bridge Pool CLLI with which the node is associated.

**Figure 25 MAP display for DMSCP/SMG4/DPT node**

|            |           |                        |     |       |         |       |       |      |        |       |      |   |
|------------|-----------|------------------------|-----|-------|---------|-------|-------|------|--------|-------|------|---|
| XAC        | MS        | IOD                    | Net | PM    | CCS     | Lns   | Trks  | Ext  | APPL   |       |      |   |
| AMDI       | Istb      | NODLOG                 | .   | 3 SPM | .       | SYSB  | 70C.. | .    | ATM_6+ |       |      |   |
| M          |           |                        |     | *C*   |         | *C*   | *C*   |      | *C*    |       |      |   |
| PERFMON    | CLASS     | ML                     | OS  | ALRM  | SYSB    | MANB  | UNEQ  | OFFL | CBSY   | PBSY  | INSV |   |
| 0 Quit     | TRUNKS    | 75                     | 0   | 0     | 0       | 0     | 0     | 527  | 0      | 0     | 89   |   |
| 2          | REMOTE    | 0                      | 0   | 0     | 0       | 0     | 0     | 42   | 0      | 0     | 0    |   |
| 3          | PROTLN    | 0                      | 0   | 0     | 0       | 0     | 0     | 3    | 0      | 0     | 0    |   |
| 4          | HSCARR    | 0                      | 0   | 0     | 0       | 0     | 0     | 545  | 0      | 0     | 95   |   |
| 5          | OC3S      | Type: DMSCP Bear: ENET |     |       |         |       |       |      |        |       |      |   |
| 6 SilMl    | PERFMON   | 0                      | SPM | 8     | OC3RM   | 0     | OC3S  | 0    |        |       |      |   |
| 7          | Interval: | 4:30\$                 |     |       | Status: |       |       |      |        |       |      |   |
| 8          | Parm      | Count                  | M   | D     | Parm    | Count | M     | D    | Parm   | Count | M    | D |
| 9 MeterPP  | LBC-N     | 255                    |     |       | OPT-N   | 255   |       |      | OPR-N  | UNSET |      |   |
| 10         | CV-N      | 0                      |     |       | ES-N    | 0     |       |      | SES-N  | 0     |      |   |
| 11         | SEFS-N    | 0                      |     |       |         |       |       |      |        |       |      |   |
| 12         |           |                        |     |       |         |       |       |      |        |       |      |   |
| 13         | PERFMON:  |                        |     |       |         |       |       |      |        |       |      |   |
| 14 PPQuery |           |                        |     |       |         |       |       |      |        |       |      |   |
| 15         |           |                        |     |       |         |       |       |      |        |       |      |   |
| 16         |           |                        |     |       |         |       |       |      |        |       |      |   |
| 17         |           |                        |     |       |         |       |       |      |        |       |      |   |
| 18         |           |                        |     |       |         |       |       |      |        |       |      |   |
| ADMIN      |           |                        |     |       |         |       |       |      |        |       |      |   |

**1.2.2.5 DPTTRM MAP Level**

The MAP screen displayed on accessing the MAPCI;MTC;TRKS;DPTTRM level is enhanced to display the DPT protocol used on posted DPT terminal node.

**Figure 26 MAP display for DPTTRM MAP**

| XAC     | MS   | IOD     | Net  | PM               | CCS                 | Lns  | Trks  | Ext | APPL    |
|---------|------|---------|------|------------------|---------------------|------|-------|-----|---------|
| AMDI    | Istb | NODLOG  | .    | 2 SPM            | .                   | .    | 60C.. | .   | SDM     |
| M       |      |         |      | *C*              |                     | CR C | *C*   |     |         |
| 0 Quit  |      | PM: SPM | 1    |                  | POSTED SET: SPM ALL | 1 OF | 5     |     |         |
| 2 Post_ |      |         |      |                  |                     |      |       |     |         |
| 3       |      | SUB     | STA  | PROT INB         | MANB                | PMB  | SYSB  | CPB | CPD IDL |
| 4 Disp_ |      | 1       | OFFL | <b>BICC</b> 2016 | 0                   | 0    | 0     | 0   | 0       |
| 5 Bsy_  |      |         |      |                  |                     |      |       |     |         |
| 6 RTS_  |      |         |      |                  |                     |      |       |     |         |
| 7       |      |         |      |                  |                     |      |       |     |         |
| 8 Frls_ |      |         |      |                  |                     |      |       |     |         |
| 9       |      |         |      |                  |                     |      |       |     |         |
| 10 Alrm |      |         |      |                  |                     |      |       |     |         |
| 11      |      |         |      |                  |                     |      |       |     |         |
| 12 Next |      |         |      |                  |                     |      |       |     |         |
| 13      |      |         |      |                  |                     |      |       |     |         |
| 14      |      |         |      |                  |                     |      |       |     |         |
| 15      |      |         |      |                  |                     |      |       |     |         |
| 16      |      |         |      |                  |                     |      |       |     |         |
| 17      |      |         |      |                  |                     |      |       |     |         |
| 18      |      |         |      |                  |                     |      |       |     |         |
| ADMIN   |      |         |      |                  |                     |      |       |     |         |

#### 1.2.2.6 Enhancements to DPTRKS MAP display

The MAP screen displayed on accessing the MAPCI;MTC;TRKS;DPTRKS level is enhanced to display the DPT protocol used on the posted DPT trunk group. This also displays the bearer network associated with the trunk group from table TRKOPTS.

**Figure 27 MAP display for DPTTRKS**

| XAC  | MS       | IOD        | Net      | PM        | CCS | Lns               | Trks              | Ext | APPL |
|------|----------|------------|----------|-----------|-----|-------------------|-------------------|-----|------|
| AMDI | Istb     | NODLOG     | .        | 2 SPM     | .   | .                 | 60C..             | .   | SDM  |
| M    |          |            |          | *C*       |     |                   | *C*               |     |      |
| 0    | Quit     |            |          |           |     |                   |                   |     |      |
| 2    | Post_    | CKT TYPE   | COM LANG |           |     | STATE             | RANGE             |     |      |
| 3    |          | 2W ISP     | DPTINATM |           |     | INS 41            | 59                |     |      |
| 4    |          |            |          |           |     | PROT: <b>BICC</b> | BEAR: <b>A1_P</b> |     |      |
| 5    | BSY_     | IDL:       | 19       |           |     |                   |                   |     |      |
| 6    | RTS_     | CPB:       | 0        |           |     |                   |                   |     |      |
| 7    | OP_      | MTC:       | 0        |           |     |                   |                   |     |      |
| 8    | FRLS_    | PV: 0      |          | FE_BLK: 0 |     |                   | FE_UNEQ: 0        |     |      |
| 9    | Reset_   |            |          |           |     |                   |                   |     |      |
| 10   |          | PENDING: 0 |          |           |     |                   |                   |     |      |
| 11   | PREV     |            |          |           |     |                   |                   |     |      |
| 12   | NEXT     |            |          |           |     |                   |                   |     |      |
| 13   |          |            |          |           |     |                   |                   |     |      |
| 14   |          |            |          |           |     |                   |                   |     |      |
| 15   | TrkQry_  |            |          |           |     |                   |                   |     |      |
| 16   | QrySig   |            |          |           |     |                   |                   |     |      |
| 17   | RouteSet |            |          |           |     |                   |                   |     |      |
| 18   | QryMtc   |            |          |           |     |                   |                   |     |      |
|      | ADMIN    |            |          |           |     |                   |                   |     |      |

### 1.2.2.7 Enhancements to TTP MAP level

The Enhancements to the MAPCI;MTC;TRKS;TTP level to be able to post trunk members associated with a bearer network, within a existing POST set. After a post set has been created using any of the existing POST commands, the post-set can be refined to POST the trunk members of a particular bearer network. The parameter range BEARNETS\_DISPLAY for parameter passed to POST command for new Option BN, is the values datafilled in DISPLAY field of table BEARNETS tuples. Refer to Figure 26 below.

The CktInfo command at MAPCI;MTC;TRKS;TTP level is enhanced to display Bearer network as shown in Figure 27 below.

**Figure 28 POST command with new parameters**

```

POST-- POST A NEW SET
Parms: [<SET TYPE> {T [<CLLI1> STRING
                    [<CNRI1> {0 TO 9999}}]
                    [<....> STRING],
      G <CLLI> STRING
        [<CLNR> {0 TO 9999}}]
        [<TO> {TO}}]
      ....
      WB <CLLI> STRING
        <CKTN> {0 TO 9999}},
      BN [<ENET> STRING]
        [<A1_P> STRING]
        [<A1_S> STRING]
        [<IP_P> STRING]
        [<IP_S> STRING]]]

```

**Figure 29 TTP level MAP display**

```

>mapci;mtc;trks;ttp;<post any trunk ckt>
>cktinfo
SPM 0 95 : INSV
SPM 0 : InSv
Ckt state : IDL
Ckt Bearer net : A1_P

```

### 1.2.3 Enhancements to LTP MAP display

The MAP screen displayed on accessing the MAPCI;MTC;LNS;LTP level is enhanced to display the bearer network of the posted line.

**Figure 30 LTP level MAP display**

| XAC       | MS   | IOD                 | Net  | PM    | CCS                 | Lns  | Trks             | Ext    | APPL  |
|-----------|------|---------------------|------|-------|---------------------|------|------------------|--------|-------|
| AMDI      | Istb | NODLOG              | .    | 3 SPM | .                   | SYSB | 69C..            | .      | ATM_6 |
| M         |      |                     |      | *C*   |                     | *C*  | *C*              |        | *C*   |
| LTP       |      |                     |      |       |                     |      |                  |        |       |
| 0 Quit    |      | POST                | DELQ |       | BUSYQ               |      | PREFIX           |        |       |
| 2 Post_   |      | LEN HOST 00 0 01 19 |      |       |                     |      | BEAR <b>ENET</b> |        |       |
| 3         |      | LCC PTY RNG         |      |       |                     |      | STA F S LTA TE   | RESULT |       |
| 4         |      | 1FR                 |      |       | DN 613 621 2590 IDL |      |                  |        |       |
| 5 Bsy     |      |                     |      |       |                     |      |                  |        |       |
| 6 RTS     |      |                     |      |       |                     |      |                  |        |       |
| 7 Diag    |      |                     |      |       |                     |      |                  |        |       |
| 8         |      |                     |      |       |                     |      |                  |        |       |
| 9 AlmStat |      |                     |      |       |                     |      |                  |        |       |
| 10 CktLoc |      | post d 6212590      |      |       |                     |      |                  |        |       |
| 11 Hold   |      |                     |      |       |                     |      |                  |        |       |
| 12 Next   |      |                     |      |       |                     |      |                  |        |       |
| 13        |      |                     |      |       |                     |      |                  |        |       |
| 14        |      |                     |      |       |                     |      |                  |        |       |
| 15 FullDn |      |                     |      |       |                     |      |                  |        |       |
| 16 Prefix |      |                     |      |       |                     |      |                  |        |       |
| 17 LCO_   |      |                     |      |       |                     |      |                  |        |       |
| 18 Level_ |      |                     |      |       |                     |      |                  |        |       |
| ADMIN     |      |                     |      |       |                     |      |                  |        |       |

## 1.2.4 Line Query Command Enhancements

### 1.2.4.1 Overview

Enhanced output of Line Query commands QDN, QLEN, QDNWRK, QLENWRK, QHASU, QGRP and QCUST to display Bearer Network Information associated with a subscriber line.

- Bearer Network Information for a subscriber line is added to the command outputs for CI commands QDN, QLEN, QDNWRK, QLENWRK, QHASU, QGRP, QLT and QCUST.
- In case of CI commands QLENWRK, QDNWRK and QHASU, the query run on a range of lines can be restricted to a Bearer Network.

No Servord Commands are being enhanced.

Details are captured in the Configuration Document for the feature.

### 1.2.5 New table OFCVAR Parm OSS\_PROV\_VERSION

A new table OFCVAR Parm OSS\_PROV\_VERSION has been introduced. The value of this Parm can be used as an ON/OFF feature switch control mechanism for features delivered on the Nortel Succession XA\_CORE which impact the OSS interface. This is so that these kind of features are turned

ON/OFF on the switch using this OFCVAR Parm, only when OSS software for switch is upgraded to accommodate the feature code changes.

Details are provided in the User Interface Section of Configuration Document for the feature.

### 1.2.6 New CI Tool QOSSVER

A new CI tool, QOSSVER, is made available to user on the Nortel Succession XA-CORE. This tool lists the feature ACTIDs of features delivered in an XA-CORE software load which have an impact on the OSS interface and which make use of the table OFCVAR Parm OSS\_PROV\_VERSION control mechanism described above. Feature ACTIDs which do not use this mechanism will not be listed.

Details about the new tool are provided in the User Interface Section of Configuration Document for the feature.

### 1.2.7 Tables MNNODE, BEARNETS and NETBRIDGE Table Control Response Messages

There are some changes to the Response messages to Users for table control operations performed on tables MNNODE, BEARNETS, NETBRIDGE.

Changes are listed in User Interface Section of Configuration Document for feature.

## 1.3 Hardware Requirements or Dependencies

All variants of bearer networks and SPMs to be data filled in the lab.

## 1.4 Software Requirements or Dependencies

Succession release SN08 software load lineup.

## 1.5 Limitations and restrictions

In SN08, if number of OM Tuples belonging to OM Groups TRK2NET2 or TRK2NET1 exceeds 16,000 during the OM Tuple creation:

No more OM tuples will be created and the following Warnings are displayed to the user:

- **While adding tuple in table TRKGRP**

“Warning: Maximum number of allowed TRK2NET2 and TRK2NET1 OM tuples has been exceeded.

Require 4 tuples

Only 3 tuples are available

The OM tuples for TRK2NET1 and TRK2NET2 could not be allocated and this

OM data will not collected for any bearer network for the newly added trunk group when MULTINET\_DISPLAY\_ACTIVE is on”

- **While adding tuple in table BEARNETS**

“Warning: Maximum number of allowed TRK2NET2 and TRK2NET1 OM tuples has been exceeded.

Require 5000 tuples

Only 1000 tuples are available

The OM tuples for TRK2NET1 and TRK2NET2 could not be allocated and this

OM data will not be collected for trunk groups using this new Bearer Network when MULTINET\_DISPLAY\_ACTIVE is on”

- **All SN07 limitations and restrictions as documented in A00003487 are inherited by this activity, unless specifically noted otherwise.**

## 1.6 Interactions

Not Applicable.

## 1.7 Glossary

| Term  | Description                                                                                                                         |
|-------|-------------------------------------------------------------------------------------------------------------------------------------|
| ABI   | Access Bridge Interface                                                                                                             |
| APG   | Anchor Packet Gateway                                                                                                               |
| CDIS  | Call Discrimination Service. This is a service provided by the Broadcom DSP that differentiates normal voice calls from VBD or Fax. |
| CICM  | Centrex IP Client Manager                                                                                                           |
| CLLI  | Common Language Location Identifier                                                                                                 |
| DMSCP | DMS Call Processing SPM                                                                                                             |
| DN    | Directory Number                                                                                                                    |
| DPT   | Dynamic Packet Trunk                                                                                                                |
| GWC   | Gate Way Controller                                                                                                                 |
| IP    | Internet Protocol                                                                                                                   |
| IW    | Inter-Working SPM                                                                                                                   |
| LEN   | Line Equipment Number                                                                                                               |
| LTP   | Line Test Position                                                                                                                  |
| MAP   | Maintenance and Administration Position                                                                                             |
| NGSS  | Next Generation Session Server                                                                                                      |
| OM    | Operational Measurements                                                                                                            |
| PM    | Peripheral Module                                                                                                                   |
| QCUST | Query Customer Information                                                                                                          |



| Term    | Description                                      |
|---------|--------------------------------------------------|
| QDN     | Query Directory Number                           |
| QDNWRK  | Query Working DN                                 |
| QGRP    | Query Group                                      |
| QHASU   | Query Hardware Assigned Software Unassigned LEN  |
| QLEN    | Query Line Equipment Number                      |
| QLENWRK | Query Working LEN                                |
| SERVORD | Service Order                                    |
| SMG4    | Media Gateway 4000 SPM                           |
| SPM     | Spectrum Peripheral Module                       |
| TDM     | Time Division Multiplexing                       |
| TTP     | Trunk Test Position                              |
| SIP-T   | Session Initiation Protocol - Telecommunications |
| VoATM   | Voice Over ATM                                   |
| VoIP    | Voice Over IP                                    |
| XPM     | XMS-Based Peripheral Module                      |

## 2: Configuration for A00006780

### 2.1 Hardware and Software Requirements

This functionality requires release SN08 or higher loads on the call server<sup>1</sup>

### 2.2 Initial Configuration

### 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

#### 2.3.1 OSS\_PROV\_VERSION (New Parameter in table OFCVAR)

A new parameter OSS\_PROV\_VERSION is being added in table OFCVAR in SN07. This Parameter's value can be used by Features delivered on Core, which have an OSS Impact, to keep the feature functionality Switched ON/OFF on Switch Core till the time OSS software is upgraded to be in sync with feature code changes.

---

1. Call Server in the Succession network.

Currently the Line Query Command enhancements (Described in Section 12.9.1 of this document) being done as part of this feature, is being controlled using this table OFCVAR Parm.

#### Example of an OSS\_PROV\_VERSION tuple in OFCVAR:

```

.....
.....
OSR_FOR_IMT                      N
OSR_FOR_ISUP                     N
OSS_PROV_VERSION               SN07
OVL_P_ID_TIME                    3
.....
.....

```

##### 2.3.1.0.1 Default value

Default value for OSS\_PROV\_VERSION is SN07.

For this feature, by default the code for the Line Query command enhancements listed under Section 12.9 of this document stays inert on the Trimodal Call Server. (The code stays inert if OSS\_PROV\_VERSION has a value of SN07)

This ensures that user needs to explicitly change the value from SN07 to any other value in permitted range of values, to get access to functionality provided by feature code which enhances Line Query Commands.

In the process, the Warning messages the user gets will ensure that the new functionality is enabled, only after upgrading the OSS software for switch.

##### 2.3.1.0.2 Permitted range of values for new OFCVAR parameter

```

>cha
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
PARMVAL: SN07
>SN02
PARM VALUE IS WRONG TYPE
TYPE IS OSS_VERSION MULTIPLE WITH
      VER      {SN07,SN08,SN09,SN10,SN11,SN12,SN13,SN14,SN15,SN16,SN17}
TUPLE TO BE CHANGED:
      OSS_PROV_VERSION                      SN02
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

### 2.3.1.0.3 Meaning of OSS\_PROV\_VERSION in SN08

ACT.A00006780(SN08 Trimodal OAMP Enhancements) uses the Office Parm OSS\_PROV\_VERSION.

- **OSS\_PROV\_VERSION = 'SN07'**

Default value of SN07, means that the functionality provided by Line Query Command enhancements made under feature and described in Section 12.9 of this document is disabled

- **OSS\_PROV\_VERSION is anything greater than 'SN07' in permitted range**

If the Parameter has a any permitted value other than SN07 i.e. greater than SN07, then it means that the functionality provided by Line Query Command enhancements made under feature and described in Section 12.9 of this document is enabled.

User needs to ensure before setting value of parameter to anything permitted other than SN07, that the OSS software for switch is upgraded to be in sync with the Line Query Commands enhancements described in Section 12.9 of this document. User receives a Warning message to the same effect before he changes value from SN07 to any other permitted value.

### 2.3.1.0.4 Warning/Error Messages

- **If user enters a value outside of permitted range**

Change shall fail and user will get an error message as shown below. Also, user will be prompted to enter correct value with a Yes/No Prompt:

```
>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
PARMVAL: SN08
>sn60
PARM VALUE IS WRONG TYPE
TYPE IS OSS_VERSION MULTIPLE WITH
VER
{SN07, SN08, SN09, SN10, SN11, SN12, SN13, SN14, SN15, SN16, SN17}
TUPLE TO BE CHANGED:
                OSS_PROV_VERSION                SN60
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
```

- **If user tries to change parameter value from default value of SN07 to any other value within permitted range i.e. greater than SN07 but a permitted value:**

Change shall pass. User would get following Warning message, just before the Yes/No Prompt:

```
>pos OSS_PROV_VERSION
                                OSS_PROV_VERSION          SN07

>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
PARMVAL: SN07
>sn08
Changing from a lower to a higher version.
Check if the OSS Software has been upgraded to support
all OSS impacting feature enhancements contained
in the load corresponding to higher version.
Use QOSSVER tool to get list of OSS impacting features
in various loads.
TUPLE TO BE CHANGED:
                                OSS_PROV_VERSION          SN08
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
```

- **If user tries to change parameter value from default value of SN07 to any other value within permitted range i.e. greater than SN07 but a value which is also greater than the current running load (SN08):**

Change shall fail. User would get following Warning messages, just before

the

Yes/No Prompt:

```
>pos OSS_PROV_VERSION
                                OSS_PROV_VERSION          SN07

>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
PARMVAL: SN07
>sn09
ERROR: HIGHEST RELEASE ACTIVATED BY THIS PARM IS SN08
TUPLE TO BE CHANGED:
                                OSS_PROV_VERSION          SN09
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>y
ERROR: HIGHEST RELEASE ACTIVATED BY THIS PARM IS SN08
```

```

DATA CONSISTENCY ERROR
UNEXPECTED ERROR CONDITION
TUPLE TO BE CHANGED:
                                OSS_PROV_VERSION          SN09
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

- **If user tries to change the value from any valid value back to SN07, which is default value:**

Change shall pass. User will get a Warning message which is shown below, just before the Yes/No Prompt:

```

>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
PARMVAL: SN08
>sn07
Changing from a higher to a lower version.
Some OSS impacting feature enhancements in
the load corresponding to higher version will stop
working after the change.
Check if the OSS Software needs to be downgraded
Use QOSSVER tool to get list of OSS impacting
features in various loads.
TUPLE TO BE CHANGED:
                                OSS_PROV_VERSION          SN08
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

## 2.4 Upgrade Considerations

### 2.4.0.1 OM Groups TRK2NET1 and TRK2NET2

In the event that the maximum numbers of OM tuples for OM groups TRK2NET1 and TRK2NET2 has been exceeded on the dump side, or will be exceeded on the restore side due to the tuple allocation enhancement provided by this feature, the tuples which are allocated are likely to be different between the two sides, due to the order in which they were allocated. On the ONP, the affected tables will restore in the order: BEARNETS, TRKGRP, OMKEYORD.

The OM tuples for TRK2NET1 and TRK2NET2 in table OMKEYORD are not transferred during the ONP since they are recreated by the transfer of tables BEARNETS and TRKGRP.

### 2.4.0.2 DISPLAY field of Tables BEARNETS and NETBRDGE

In SN08, the DISPLAY field of tables BEARNETS and NETBRDGE are required to be non-empty and unique for each Bearer Network (Table

BEARNETS) and each Network Bridge CLI(NETBRDGE). Due to enforcement of these criteria, if these fields were not provisioned accordingly in the DUMP side datafill, a warning will be provided indicating that these values should be changed in the SN08 datafill to conform. The warning message will be recorded in the standard TRACE file on XACORE during the execution of TABXFR. Refer to section 12.8.8 for further details.

## 2.5 Data schema (DS) (CM, MIBS, RDB)

Not Applicable.

## 2.6 Service Orders (SO)

Not Applicable.

## 2.7 Software optionality control (SOC)

Not Applicable.

## 2.8 Element Management

Not Applicable.

## 2.9 User interface changes

### 2.9.1 Enhanced Line Query Commands commands

The sample datafill for the Table BEARNETS which is used as reference for the examples presented further below in “Sample BEARNETS table datafill” on page 850:

**Figure 1 Sample BEARNETS table datafill**

|                                                         |                |         |        |                           |
|---------------------------------------------------------|----------------|---------|--------|---------------------------|
| TABLE: BEARNETS                                         |                |         |        |                           |
| <line length>: 76 columns can be output per line.       |                |         |        |                           |
| <pack mode>: Pack mode is ON.                           |                |         |        |                           |
| <indent column>: Indented lines will begin in column 1. |                |         |        |                           |
| <first column>: The first column of output is column 1. |                |         |        |                           |
| TOP                                                     |                |         |        |                           |
| NETIDX                                                  | BNETNAME       | DISPLAY | FABRIC | OPTIONS                   |
| -----                                                   |                |         |        |                           |
| NET 0                                                   | TDM_ENET       | ENET    | ENET   | \$                        |
| NET 1                                                   | AAL1_PRIMARY   | A1_P    | AAL1   | (PKT_NETWORK_DEFAULT ) \$ |
| NET 2                                                   | AAL1_SECONDARY | A1_S    | AAL1   | \$                        |
| NET 3                                                   | IP_PRIMARY     | IP_P    | IP     | \$                        |
| BOTTOM                                                  |                |         |        |                           |

### 2.9.1.1 QDN Command

#### 2.9.1.1.1 Description

Line Query command QDN is used to display information about a Directory Number (DN).

Command is enhanced to display Bearer Network Information as part of the Command Output.

A new field **BEARERNET** is added to the Command Output.

The information printed in the BEARERNET FIELD is in the following format:-

**BEARERNET: <FABRIC> <DISPLAY>**

where,

- **DISPLAY:** Value datafilled in DISPLAY field of the table BEARNETS tuple, corresponding to the Bearer Network to which the DN belongs.
- **FABRIC:** Value datafilled in FABRIC field of the table BEARNETS tuple, corresponding to the Fabric of the Bearer Network to which the DN belongs.

**Examples (Refer to the “Sample BEARNETS table datafill” on page 850):**

**Figure 2 Enhanced QDN command output for a DN**

```

CI>qdn 5207700
-----
DN:          5207700
TYPE: SINGLE PARTY LINE
SNPA: 214    SIG: DT    LNATTIDX: 1
LINE EQUIPMENT NUMBER:      SLOA  77 1 20 00
LINE CLASS CODE:           1FR
CARDCODE:  RDTLSG    GND: N  PADGRP: PKLNL  BNV: NL MNO: N
PM NODE NUMBER      :      129
PM TERMINAL NUMBER  :      913
BEARERNET: AAL1 A1_P
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID SRA
-----

```

## 2.9.1.2 QLT Command

### 2.9.1.2.1 Description

Line Query command QLT is used to display information about a Logical Terminal ID(LTID).

Command is enhanced to display Bearer Network Information as part of the Command Output, if LTID is mapped to a LEN in table LTMAP.

A new field **BEARERNET** is added to the Command Output.

The information printed in the BEARER NET FIELD is in the following format:-

**BEARER NET: <FABRIC> <DISPLAY>**

where,

- **DISPLAY:** Value datafilled in DISPLAY field of the table BEARNETS tuple, corresponding to the Bearer Network to which the DN belongs.
- **FABRIC:** Value datafilled in FABRIC field of the table BEARNETS tuple, corresponding to the Fabric of the Bearer Network to which the DN belongs.

**Examples (Refer to the “Sample BEARNETS table datafill” on page 850):**

**Figure 3 Enhanced QLT command output for a LTID**

```
>qlt isdn 194
-----
LTID: ISDN      194
SNPA: 416
DIRECTORY NUMBER: 4738073
LT GROUP NO: 0
LTCLASS: BRAFS  DEFAULT LOGICAL TERMINAL: N
EKTS: N  CACH: N
SLBRI: N
BEARER SERVICE ALLOWED: VOICE  VBD  CMD
CS: Y PS: N
ELN: N
VERSION: FUNCTIONAL ISSUE: 2
TSPID: 4164738073
LEN: HOST 01 1 11 22  TEI: DYNAMIC
BEARER NET: ENET ENET
CUSTGRP: MDC416 SUBGRP: 0 NCOS: 0 RING: Y
LINE CLASS CODE: ISDNKSET
MAXKEYS: 64
OPTIONS:
SFC
CUSTOMER GROUP OPTIONS:
AIN CDP CODE
OFFICE OPTIONS:
AIN TIID

  KEY      DN
  ---      --
    1      DN      4164738073

  KEY      FEATURE
  ---      -
    NONE
```

### 2.9.1.3 QLEN Command

#### 2.9.1.3.1 Description

Line Query command QLEN is used to display information about a Line Equipment Number (LEN).

Command is enhanced to display Bearer Network Information as part of the Command Output.



A new field **BEARERNET** is added to the Command Output.

The information printed in the BEARERNET FIELD is in the following format:-

**BEARERNET: <FABRIC> <DISPLAY>**

where,

- **DISPLAY:** Value datafilled in DISPLAY field of the table BEARNETS tuple, corresponding to the Bearer Network to which the LEN belongs.
- **FABRIC:** Value datafilled in FABRIC field of the table BEARNETS tuple, corresponding to the Fabric of the Bearer Network to which the LEN belongs.

### Examples:

**Figure 4 Enhanced QLEN command output for LEN**

```

CI>qlen sloa 23 3 4 2
-----
LEN:      SLOA  23 3 04 02
TYPE: SINGLE PARTY LINE
SNPA: 613
DIRECTORY NUMBER:      7202342
LINE CLASS CODE:       1FR
IBN TYPE: STATION
CUSTGRP:      RES1      SUBGRP: 0  NCOS: 0
SIGNALLING TYPE: DIGITONE
LINE TREATMENT GROUP:   0
LINE ATTRIBUTE INDEX:   30
CARD CODE:  RDTLSG      GND: N  PADGRP: PKLNL  BNV: NL MNO: N
PM NODE NUMBER      :    118
PM TERMINAL NUMBER  :    147
BEARERNET: IP IP_P
OPTIONS:
DGT
RES OPTIONS: NONE
OFFICE OPTIONS:
SRA

```

#### 2.9.1.4 QDNWRK Command

Line Query Command QDNWRK displays information about a range of working lines using Directory Numbers, which meet the conditions specified by the query parameters passed to the command the user.

The command format is enhanced to include a mandatory query parameter called **BEARNETWORK**.

The range of DNs passed to command is refined such that the output includes DNs which belong to the Bearer Network passed as BEARNETWORK and which meet the specifications set by the values passed for the other command parameters

As mentioned earlier, BEARNETWORK Parm selects only DNs which are physically associated to a LEN, directly or indirectly(e.g. LTIDs which are MAPPED to a LEN in table LTMAP). This is because only if DN is associated/attached to a LEN, can it be said that DN is part of a particular Bearer Network.

**Table 1 New Mandatory Command Parameter “BEARNETWORK”**

| Parameter Name | Valid input                                                                                                                                                                                                                                                                                           | Description                                                                                                                                                                                                                                                                                                                   | Areas affected by prompt |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| BEARNETWORK    | <p>Range includes “ALL” and Character Strings datafilled in DISPLAY field of all table BEARNETS tuples:</p> <p>BNETDISP_RANGE{ENET, A1_P, A1_S, IP, ALL}</p> <p>Default value if no PARM is added is “ALL”, which means DNs corresponding to all Provisioned Bearer Networks is included in Query</p> | <p>A bearer network is entered for BEARNETWORK parameter of the command.</p> <p>A range of DNs and some other command parameters are also passed to the command.</p> <p>Command output includes DNs from the range which belong to the bearer network. The DNs also satisfy the command parameters other than BEARNETWORK</p> | N/A                      |

**Figure 5 QDNWRK command format with new BEARNETWORK parameter**

```

CI>help qdnwrk
COMMAND QDNWRK : QUERY WORKING DIRECTORY NUMBERS
COMMAND FORMAT :
QDNWRK <DIRECTORY NUMBER RANGE><BEARNETWORK><LCC><OPTION><SUMMARY OR DETAIL>

```

#### 2.9.1.4.1 Examples:

- **QDNWRK SUMMARY output when default parameter “ALL” is passed for BEARNETWORK**

Prints SUMMARY output for DNs belonging to any Bearer Network datafilled in table BEARNETS, which satisfy the values passed in for the command parameters other than BEARNETWORK.

**Figure 6 QDNWRK command SUMMARY output in Prompt Mode**

```
CI>qdnwrk
DIRECTORY_NUMBER_RANGE: ALL
>
BEARNETWORK: ALL
>
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>s
COMMAND AS ENTERED
QDNWRK ALL  ALL NLCC $ ALL S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
REPORT ON WORKING DIRECTORY NUMBERS
      LCC ALL                      OPTION ALL
      TOTAL COUNT OF WORKING DN:      135
```

**Figure 7 QDNWRK SUMMARY command in No Prompt Mode (Same Output)**

```
>QDNWRK ALL  ALL NLCC $  S
COMMAND AS ENTERED
QDNWRK ALL  ALL NLCC $ ALL S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
```

- **QDNWRK DETAIL output when default parameter “ALL” is passed for BEARNETWORK**

Prints DETAIL output for DNs belonging to any Bearer Network datafilled in table BEARNETS, which satisfy the values passed in for the command parameters other than BEARNETWORK.

**Figure 8 QDNWRK command DETAIL output in Prompt Mode**

```

CI>qdnwrk
DIRECTORY_NUMBER_RANGE: ALL
>
BEARNETWORK: ALL
>
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>d
COMMAND AS ENTERED
QDNWRK ALL  ALL NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
REPORT ON WORKING DIRECTORY NUMBERS
  LCC ALL              OPTION ALL
-----
DN:      5207700
TYPE: SINGLE PARTY LINE
SNPA: 214  SIG: DT  LNATTIDX: 1
LINE EQUIPMENT NUMBER:  SLOA  77 1 20 00
LINE CLASS CODE:      1FR
CARDCODE:  RDTLSG  GND: N  PADGRP: PKLNL  BNV: NL MNO: N
PM NODE NUMBER      : 129
PM TERMINAL NUMBER : 913
BEARERNET: AAL1 A1_P
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID SRA
-----
. . .
DN:      6211002
TYPE: SINGLE PARTY LINE
SNPA: 613  SIG: DT  LNATTIDX: 407
LINE EQUIPMENT NUMBER:  HOST  01 1 00 01
LINE CLASS CODE:      1FR
CARDCODE:  6X17AC  GND: N  PADGRP: STDLN  BNV: NL MNO: N
PM NODE NUMBER      : 90
PM TERMINAL NUMBER : 2
BEARERNET: ENET ENET
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID
TOTAL COUNT OF WORKING DN:      135

```

**Figure 9 QDNWRK DETAIL command in No Prompt Mode (Same Output)**

```

>QDNWRK ALL  ALL NLCC $  D
COMMAND AS ENTERED
QDNWRK ALL  ALL NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QDNWRK SUMMARY output when a particular Bearer Network is passed for BEARNETWORK**

Prints SUMMARY output for DNs belonging to a particular Bearer Network datafilled in table BEARNETS entered for parameter BEARNETWORK, which satisfy the values passed in for the command parameters other than BEARNETWORK.

**Figure 10 QDNWRK SUMMARY command output in Prompt Mode**

```

CI>qdnwrk
DIRECTORY_NUMBER_RANGE: ALL
>
BEARNETWORK: ALL
> ENET
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>s
COMMAND AS ENTERED
QDNWRK ALL ENET NLCC $ ALL S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
REPORT ON WORKING DIRECTORY NUMBERS
      LCC ALL                      OPTION ALL
      613621 : DN NOT IN HUNTMEM
.....
.....
TOTAL COUNT OF WORKING DN: 20

```

**Figure 11 QDNWRK SUMMARY command in No Prompt Mode (Same Output)**

```

>QDNWRK ALL ENET NLCC $ S
COMMAND AS ENTERED
QDNWRK ALL ENET NLCC $ ALL S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QDNWRK DETAIL output when a particular Bearer Network is passed for BEARNETWORK**

Prints DETAIL output for DNs belonging to a particular Bearer Network datafilled in table BEARNETS entered for parameter BEARNETWORK, which satisfy the values passed in for the command parameters other than BEARNETWORK.

**Figure 12 QDNWRK DETAIL command output in Prompt Mode**

```

CI>qdnwrk
DIRECTORY_NUMBER_RANGE: ALL
>
BEARNETWORK: ALL
>ENET
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>d
COMMAND AS ENTERED
QDNWRK ALL ENET NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
REPORT ON WORKING DIRECTORY NUMBERS
    LCC ALL                OPTION ALL
-----
DN:      6211001
TYPE: SINGLE PARTY LINE
SNPA: 613 SIG: DT      LNATTIDX: 406
LINE EQUIPMENT NUMBER: HOST  01 1 00 01
LINE CLASS CODE:      1FR
CARDCODE: 6X17AC GND: N  PADGRP: STDLN BNV: NL MNO: N
PM NODE NUMBER      :    90
PM TERMINAL NUMBER  :    1
BEARERNET: ENET ENET
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID
-----
. . . .
DN:      6211005
TYPE: SINGLE PARTY LINE
SNPA: 613 SIG: DT      LNATTIDX: 407
LINE EQUIPMENT NUMBER: HOST  01 1 00 05
LINE CLASS CODE:      1FR
CARDCODE: 6X17AC GND: N  PADGRP: STDLN BNV: NL MNO: N
PM NODE NUMBER      :    90
PM TERMINAL NUMBER  :    5
BEARERNET: ENET ENET
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID
TOTAL COUNT OF WORKING DN: 20

```

**Figure 13 QDNWRK DETAIL command in No Prompt Mode (Same Output)**

```

>QDNWRK ALL ENET NLCC $ D
COMMAND AS ENTERED
QDNWRK ALL ENET NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

### 2.9.1.4.2 Responses

**Figure 14 BEARNETWORK entered is out of valid range**

```

CI>qdnwrk
DIRECTORY_NUMBER_RANGE: ALL
>
BEARNETWORK: ALL
>jdhjd
  ***  ERROR  ***
JDHJD
|
TYPE OF BEARNETWORK IS BNETDISP_RANGE
BEARNETWORK: ALL
>BNETDISP_RANGE
  ***  ERROR  ***
BNETDISP_RANGE
|
TYPE OF BEARNETWORK IS BNETDISP_RANGE
TYPE IS BNETDISP_RANGE {ENET, A1_P, A1_S, IP, ALL}
BEARNETWORK: ALL
>A1_P ----->Valid value such that an entry is there in table BEARNETS
AGENT OR LINE CLASS CODE: NLCC
>

```

### 2.9.1.5 QLENWRK Command

Line Query command QLENWRK displays information about a range of working lines using Line Equipment Numbers (LENs), which meet the conditions specified by the query parameters passed to the command the user.

The command format is enhanced to include a mandatory query parameter called **BEARNETWORK**.

The range of LENs passed to command is refined such that: The output includes LENs which belong to the Bearer Network passed as BEARNETWORK and which meet the specifications set by the values passed for the other command parameters

**Table 2 New Mandatory Command Parameter “BEARNETWORK”**

| Parameter Name | Valid input                                                                                                                                                                                                                                                                                                  | Description                                                                                                                                                                                                                                                                                                                          | Areas affected by prompt |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| BEARNETWORK    | <p>Range includes “ALL” and Four Character Strings datafilled in DISPLAY field of all table BEARNETS tuples:</p> <p>BNETDISP_RANGE{ENET, A1_P, A1_S, IP, ALL}</p> <p>Default value if no PARM is added is “ALL”, which means LENSs corresponding to all Provisioned Bearer Networks is included in Query</p> | <p>A bearer network is entered for BEARNETWORK parameter of the command.</p> <p>A range of LENSs and some other command parameters are also passed to the command.</p> <p>Command output includes LENSs from the range which belong to the bearer network. The LENSs also satisfy the command parameters other than BEARNETWORK.</p> | N/A                      |

**Figure 15 QLENWRK command format with new BEARNETWORK parameter**

```

CI>q qlenwrk
COMMAND QLENWRK : QUERY WORKING LINE EQUIPMENT NUMBERS
COMMAND FORMAT :
QLENWRK <LINE MODULE RANGE><LINE DRAWER RANGE><BEARNETWORK><LCC OR
ACC><OPTION><SUMMARY OR DETAIL>

```

**2.9.1.5.1 Examples:**

- **QLENWRK SUMMARY output when default parameter “ALL” is passed for BEARNETWORK**

Prints SUMMARY output for LENSs which satisfy the values passed in for the command parameters other than BEARNETWORK, irrespective of which Bearer Network provisioned in table BEARNETS they belong to.



**Figure 16 QLENWRK SUMMARY output in Prompt Mode**

```

CI>qlenwrk
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>s
COMMAND AS ENTERED
QLENWRK ALL  ALL ALL NLCC $ S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
WARNING : Queries of all LENS or a large range of LENS
          may run for 30 minutes or more before producing any output
Please confirm ("YES", "Y", "NO", or "N"):
>y
SUMMARY OF WORKING LINE EQUIPMENT NUMBERS
DRAWERS ALL
LCC ALL          OPTION ALL
COUNT BY LINE DRAWERS
 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
 32 33 34 35
LM : HOST 01 1   COUNT : 137
 16 18 16 17    0 0 0 0 17 20 17 16 0 0 0 0
          TOTAL:      137
. . . . .
DRAWER TOTALS:
 16 18 16 17    0 0 0 0 17 20 17 16 0 0 0 0

```

**Figure 17 QLENWRK SUMMARY output in No Prompt Mode (Same Output)**

```

>QLENWRK ALL  ALL ALL NLCC $ S
COMMAND AS ENTERED
QLENWRK ALL  ALL ALL NLCC $ S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QLENWRK DETAIL output when default parameter “ALL” is passed for BEARNETWORK:**

Prints DETAIL output for LENS which satisfy the values passed in for the command parameters other than BEARNETWORK, irrespective of which Bearer Network provisioned in table BEARNETS they belong to.

Figure 18 QLENWRK DETAIL output in Prompt Mode

```

CI>qlenwrk
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>d
COMMAND AS ENTERED
QLENWRK ALL ALL ALL NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
WARNING : Queries of all LENS or a large range of LENS
          may run for 30 minutes or more before producing any output
Please confirm ("YES", "Y", "NO", or "N"):
>y
REPORT ON WORKING LINE EQUIPMENT NUMBERS
      DRAWERS ALL
      LCC ALL          OPTION ALL
-----
LEN:      HOST 01 1 00 00
TYPE: SINGLE PARTY LINE
DN 6136211001 LCC      1FR      SIG DT LNATTIDX 407
CARDCODE: 6X17AA      GND: N   PADGRP: STDLN  BNV: NL MNO: N
PM NODE NUMBER      :      90
PM TERMINAL NUMBER  :      1
BEARER NET: ENET ENET
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID
-----
.....
LEN:      SLOA 23 3 04 02
TYPE: SINGLE PARTY LINE
SNPA: 613
DIRECTORY NUMBER:      7202342
LINE CLASS CODE:      1FR
IBN TYPE: STATION
CUSTGRP:      RES1      SUBGRP: 0  NCOS: 0
SIGNALLING TYPE: DIGITONE
LINE TREATMENT GROUP:      0
LINE ATTRIBUTE INDEX:      30
CARDCODE: RDTLSG      GND: N   PADGRP: PKLNL  BNV: NL MNO: N
PM NODE NUMBER      :      118
PM TERMINAL NUMBER  :      147
BEARER NET: IP IP_P
OPTIONS:
DGT
RES OPTIONS: NONE
OFFICE OPTIONS:
SRA
-----
TOTAL:      137

```

Figure 19 QLENWRK DETAIL command in No Prompt Mode (Same Output)

```

>QLENWRK ALL ALL ALL NLCC $ ALL D
COMMAND AS ENTERED
QLENWRK ALL ALL ALL NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QLENWRK SUMMARY** output when a particular Bearer Network is passed for BEARNETWORK:

**Figure 20 QLENWRK SUMMARY command output in Prompt Mode**

```

CI>qlenwrk
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
> ENET
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>s
COMMAND AS ENTERED
QLENWRK ALL ALL NETO NLCC $ S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
WARNING : Queries of all LENS or a large range of LENS
          may run for 30 minutes or more before producing any output
Please confirm ("YES", "Y", "NO", or "N"):
>y
SUMMARY OF WORKING LINE EQUIPMENT NUMBERS
DRAWERS ALL
LCC ALL          OPTION ALL
COUNT BY LINE DRAWERS
 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
 32 33 34 35
LM : HOST 01 1 COUNT : 20
8 4 4 4 0 0 0 0 0 0 0 0 0 0 0 0
TOTAL: 137
. . . . .
DRAWER TOTALS:
8 4 4 4 0 0 0 0 0 0 0 0 0 0 0 0

```

**Figure 21 QLENWRK SUMMARY command in No Prompt Mode (Same Output)**

```

>QLENWRK ALL ALL ENET NLCC $ S
COMMAND AS ENTERED
QLENWRK ALL ALL ENET NLCC $ S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QLENWRK DETAIL** output when a particular Bearer Network is passed for BEARNETWORK:  
Prints DETAIL output for DN's in range, which belong to the Bearer Network passed in as BEARNETWORK parameter and comply with the values entered for the other command parameters.

**Figure 22 QLENWRK DETAIL command in Prompt Mode**

```

CI>qlenwrk
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>ENET
AGENT OR LINE CLASS CODE: NLCC
>
OPTION:
>$
SUMMARY OR DETAIL: S
>d
COMMAND AS ENTERED
QLENWRK ALL ALL NET0 NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
WARNING : Queries of all LENS or a large range of LENS
           may run for 30 minutes or more before producing any output
Please confirm ("YES", "Y", "NO", or "N"):
>y
REPORT ON WORKING LINE EQUIPMENT NUMBERS
      DRAWERS ALL
      LCC ALL          OPTION ALL
-----
LEN:      HOST 01 1 00 00
TYPE: SINGLE PARTY LINE
DN 6136211001 LCC      1FR      SIG DT LNATTIDX 406
CARDCODE: 6X17AA      GND: N    PADGRP: STDLN  BNV: NL MNO: N
PM NODE NUMBER      :      90
PM TERMINAL NUMBER  :      1
BEARERNET: ENET ENET
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID
-----
.....
LEN:      HOST 01 1 00 05
TYPE: SINGLE PARTY LINE
DN 6136211005 LCC      1FR      SIG DT LNATTIDX 407
CARDCODE: 6X17AA      GND: N    PADGRP: STDLN  BNV: NL MNO: N
PM NODE NUMBER      :      90
PM TERMINAL NUMBER  :      5
BEARERNET: ENET ENET
OPTIONS:
DGT
OFFICE OPTIONS:
U3WC AIN TIID
-----
TOTAL: 20

```

**Figure 23 QLENWRK command in No Prompt Mode (Same Output)**

```

>QLENWRK ALL ALL ENET NLCC $ ALL D
COMMAND AS ENTERED
QLENWRK ALL ALL ENET NLCC $ ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

### 2.9.1.5.2 Responses

**Figure 24 BEARNETWORK out of valid range value**

```

CI>qlenwrk
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>jdhjd
*** ERROR ***
JDHJD
|
TYPE OF BEARNETWORK IS BNETDISP_RANGE
BEARNETWORK: ALL
>BNETDISP_RANGE
*** ERROR ***
BNETDISP_RANGE
|
TYPE OF BEARNETWORK IS BNETDISP_RANGE
TYPE IS BNETDISP_RANGE {ENET, A1_P, A1_S, IP, ALL}
BEARNETWORK: ALL
>A1_P
AGENT OR LINE CLASS CODE: NLCC
>

```

### 2.9.1.6 QHASU Command

Line Query command QHASU displays hardware assigned and software unassigned Line Equipment Numbers in a specified range. Enhance the command QHASU to allow querying by the Bearer Network.

The command format is enhanced to include a mandatory query parameter called **BEARNETWORK**.

The range of LENSs passed to command is refined such that: The output includes LENSs which belong to the Bearer Network passed as BEARNETWORK and which meet the specifications set by the values passed for the other command parameters

**Table 3 New Mandatory Command Parameter “BEARNETWORK”**

| Parameter Name | Valid input                                                                                                                                                                                                                                                                                                  | Description                                                                                                                                                                                                                                                                                                                         | Areas affected by prompt |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| BEARNETWORK    | <p>Range includes “ALL” and Four Character Strings datafilled in DISPLAY field of all table BEARNETS tuples:</p> <p>BNETDISP_RANGE{ENET, A1_P, A1_S, IP, ALL}</p> <p>Default value if no PARM is added is “ALL”, which means LENSs corresponding to all Provisioned Bearer Networks is included in Query</p> | <p>A bearer network is entered for BEARNETWORK parameter of the command.</p> <p>A range of LENSs and some other command parameters are also passed to the command.</p> <p>Command output includes LENSs from the range which belong to the bearer network. The LENSs also satisfy the command parameters other than BEARNETWORK</p> | N/A                      |

**Figure 25 Enhanced QHASU command format**

```
QHASU <LINE MODULE RANGE><LINE DRAWER RANGE><CARDTYPE><GND><BEARNETWORK><SUMMARY
OR DETAIL>
```

**2.9.1.6.1 Examples:**

- **QHASU SUMMARY output when default parameter “ALL” is passed for BEARNETWORK**

Prints SUMMARY output for LENS which satisfy the values passed in for the command parameters other than BEARNETWORK, irrespective of which Bearer Network provisioned in table BEARNETS they belong to.

**Figure 26 QHASU command SUMMARY output in Prompt Mode**

```
CI>qhasu
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>
CARD CODE: NIL_CC
>
GND: N
>
SUMMARY OR DETAIL: S
>s
COMMAND AS ENTERED
QHASU ALL ALL ALL NIL_CC N S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
SUMMARY OF HARDWARE ASSIGNED SOFTWARE UNASSIGNED LEN -- HASU
DRAWERS ALL
CARDTYPE ALL OPT ALL
COUNT BY LINE DRAWERS
00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
32 33 34 35
LM : HOST 01 1 COUNT : 5
2 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0
TOTAL: 5
. . . . .
DRAWER TOTALS:
2 2 1 0 0 0 0 0 0 0 0 0 0 0 0 0
```

**Figure 27 QHASU SUMMARY command in No Prompt Mode (Same Pout**

```
>QHASU ALL ALL NIL_CC N ENET S
COMMAND AS ENTERED
QHASU ALL ALL NIL_CC N ENET S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
```

- **QHASU DETAIL output when default parameter “ALL” is passed for BEARNETWORK:**

Prints DETAIL output for LENS which satisfy the values passed in for the command parameters other than BEARNETWORK, irrespective of which Bearer Network provisioned in table BEARNETS they belong to.

**Figure 28 QHASU command DETAIL output in Prompt Mode**

```

CI>qhasu
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>
CARD CODE: NIL_CC
>
GND: N
>
SUMMARY OR DETAIL: S
>d
COMMAND AS ENTERED
QHASU ALL ALL ALL NIL_CC N D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
HARDWARE ASSIGNED SOFTWARE UNASSIGNED LEN -- HASU
DRAWERS ALL
CARDTYPE ALL OPT ALL
LM COUNT LD COUNT LINE CARD SLOTS
HOST 01 1 5 0 2 3 18
      1 2 18 19
      2 1 13
      TOTAL: 5

```

**Figure 29 QHASU DETAIL command in No Prompt Mode (Same Output)**

```

>QHASU ALL ALL NIL_CC N ALL D
COMMAND AS ENTERED
QHASU ALL ALL NIL_CC N ALL D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QHASU SUMMARY output when a particular Bearer Network is passed for BEARNETWORK:**

Prints SUMMARY output for LENS in the range, which belong to the Bearer Network passed in as BEARNETWORK parameter and comply with the values entered for the other command parameters.

**Figure 30 QHASU command SUMMARY output in Prompt Mode**

```

CI>qhasu
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARER_NETWORK: ALL
> ENET
CARD CODE: NIL_CC
>
GND: N
>
SUMMARY OR DETAIL: S
>s
COMMAND AS ENTERED
QHASU ALL ALL ENET NIL_CC N S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
SUMMARY OF HARDWARE ASSIGNED SOFTWARE UNASSIGNED LEN -- HASU
DRAWERS ALL
CARDTYPE ALL OPT ALL
COUNT BY LINE DRAWERS
  00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15
  16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
  32 33 34 35
LM : HOST 01 1 COUNT : 2
  2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
      TOTAL: 2
. . . . .
DRAWER TOTALS:
  2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

```

**Figure 31 QHASU SUMMARY command in No Prompt Mode (Same Output)**

```

>QHASU ALL ALL NIL_CC N ENET S
COMMAND AS ENTERED
QHASU ALL ALL NIL_CC N ENET S
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y

```

- **QHASU DETAIL output when a particular Bearer Network is passed for BEARNETWORK:**  
Prints DETAIL output for LENS in range, which belong to the Bearer Network passed in as BEARNETWORK parameter and comply with the values entered for the other command parameters.



**Figure 32 QHASU DETAIL output in Prompt Mode**

```

CI>qhasu
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARER NETWORK: ENET
>ENET
CARD CODE: NIL_CC
>
GND: N
>
SUMMARY OR DETAIL: S
>d
COMMAND AS ENTERED
QHASU ALL  ALL  ENET NIL_CC N D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y
HARDWARE ASSIGNED SOFTWARE UNASSIGNED LEN -- HASU
      DRAWERS ALL
CARDTYPE ALL          OPT ALL
      LM  COUNT LD COUNT          LINE CARD SLOTS
HOST  01 1 2 0   2       3 18
      TOTAL:                0

```

**Figure 33 QHASU DETAIL command in No Prompt Mode (Same Output)**

```

>QHASU ALL  ALL  NIL_CC N ENET D
COMMAND AS ENTERED
QHASU ALL  ALL  NIL_CC N ENET D
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>Y

```

### 2.9.1.6.2 Responses:

**Figure 34 BEARNETWORK entered is out of valid range**

```

CI>qhasu
LINE_MODULE_RANGE: ALL
>
LINE_DRAWER_RANGE: ALL
>
BEARNETWORK: ALL
>jdhjd
*** ERROR ***
JDHJD
|
TYPE OF BEARNETWORK IS BNETDISP_RANGE
BEARER NETWORK: ALL
>BNETDISP_RANGE
*** ERROR ***
BNETDISP_RANGE
|
TYPE OF BEARNETWORK IS BNETDISP_RANGE
TYPE IS BNETDISP_RANGE {ENET, A1_P, A1_S, IP, ALL}
BEARNETWORK: ALL
>A1_P ----->Valid value such that an entry is there in table BEARNETS
AGENT OR LINE CLASS CODE: NLCC
>

```

### 2.9.1.7 QGRP Command

Line Query command QGRP queries information about Members belonging to Line Groups like CPU, SCU, QBS etc. and displays the information to the user.

The command output is enhanced to display against each Group member, the information about the Bearer Network to which the member belongs.

The enhanced output format for a Group member has bearer network information added as **<FABRIC> <DISPLAY>**:

where,

- **FABRIC:** Value datafilled in FABRIC field of the table BEARNETS tuple, corresponding to the Fabric of the Bearer Network to which the LEN belongs.
- **DISPLAY:** Value datafilled in DISPLAY field of the table BEARNETS tuple, corresponding to the Bearer Network to which the LEN belongs.

This enhancement holds true for the following command options of QGRP command only, as listed below:

QGRP CPU <LINE EQUIPMENT NUMBER>

QGRP QBS <LINE EQUIPMENT NUMBER> <KEY>

QGRP MDN <LINE EQUIPMENT NUMBER OR LOGICAL TERMINAL ID> <KEY>

QGRP MDN <DIRECTORY NUMBER>

QGRP MDN <DIRECTORY NUMBER> <BRIEF FULL OR CA <CALL APPEARANCE NUMBER>>

QGRP HNT <DIRECTORY NUMBER OR LINE EQUIPMENT NUMBER> <KEY>

QGRP HNT <DIRECTORY NUMBER OR LINE EQUIPMENT NUMBER>

QGRP BLF <DIRECTORY NUMBER>

For ISDN agents which are not attached to a LEN, the message 'UNATTACHED TO A LEN' is displayed.

### 2.9.1.7.1 Examples:

**Figure 35 Enhanced QGRP command output for CPU Command Option**

```
>qgrp cpu SLOA 23 3 08 07

CPU GROUP
-----

LINKLEN:      SLOA  23 3 08 07 KEY 1    BEARERNET: AAL1 A1_S      9097500036
               SLOA  23 3 08 07 KEY 8    BEARERNET: AAL1 A1_S
               SLOA  23 3 08 07 KEY 2    BEARERNET: AAL1 A1_S      9097500074

The number of members in the CPU GROUP is 3.
```

**Figure 36 Enhanced QGRP command output for QBS Command Option**

```
>qgrp qbs HOST 00 0 08 05 2
LEN AND KEY NOT A MEMBER OF INTERCOM GROUP

QBS GROUP
-----

MONITORED LEN:  HOST 00 0 08 04      BEARER NET: ENET ENET
                  HOST 00 0 08 05 KEY 2  BEARER NET: ENET ENET

The number of members in the QBS GROUP is 1.
```

**Figure 37 Enhanced QGRP command output for HNT Command Option**

```
>qgrp hnt 9519111

DLH HUNT GROUP #9
-----

PILOT:          HOST 00 0 00 29 KEY 2      BEARER NET: ENET ENET DN      9099519111
                SLOA 23 3 08 09 KEY 4      BEARER NET: AAL1 A1_S
                CGA      105      KEY 11     BEARER NET: ENET ENET

HUNT options <TFO> apply to this HUNT GROUP.
The number of members in the HUNT GROUP is 3.
```

**Figure 38 Enhanced QGRP command output for BLF Command Option**

```
>qgrp blf 4731064
-----
THE LENS MONITORING THE INPUT DN VIA BLF ARE:

LEN              KEY  TYPE              BEARER NET
.....
HOST 01 1 09 19      2    GROUP_MONITOR  BEARER NET: ENET ENET
-----
```

**Figure 39 Enhanced QGRP command output with Non-Attached ISDN Agents**

```
>qgrp cpu HOST 00 0 08 01

CPU GROUP
-----

LINKLEN:        HOST 00 0 08 01 KEY 1      BEARER NET: ENET ENET      6137222008
                FUNC      3    KEY 1      BEARER NET: AAL1 A1_P      6137223002
                FUNC      27    KEY 1      UNATTACHED TO A LEN      6137223027

The number of members in the CPU GROUP is 3.
```

**Figure 40 Enhanced QGRP command output for MDN Command Option**

```
>qgrp mdn 4731064 brief

MDN GROUP
-----

HOST 01 1 09 19 KEY 1    BEARER NET: ENET ENET

There is no Primary member associated with this group.
Member HOST 01 1 09 19 has the following options :
CPU 0 HOST 01 1 09 19 1
CUSTOMER GROUP OPTIONS:
AIN CDPCODE
OFFICE OPTIONS:
AIN TIID

The number of members in the SCA MDN GROUP is 1.

>qgrp mdn 4731064 full

MDN GROUP
-----

HOST 01 1 09 19 KEY 1    BEARER NET: ENET ENET

There is no Primary member associated with this group.
Member HOST 01 1 09 19 has the following options :
CPU 0 HOST 01 1 09 19 1
CUSTOMER GROUP OPTIONS:
AIN CDPCODE
OFFICE OPTIONS:
AIN TIID

The number of members in the SCA MDN GROUP is 1.

>qgrp mdn 4731064 ca 4164731064

MDN GROUP
-----

HOST 01 1 09 19 KEY 1    BEARER NET: ENET ENET

There is no Primary member associated with this group.
Member HOST 01 1 09 19 has the following options :
CPU 0 HOST 01 1 09 19 1
CUSTOMER GROUP OPTIONS:
AIN CDPCODE
OFFICE OPTIONS:
AIN TIID

The number of members in the SCA MDN GROUP is 1.

>
```

```
>qgrp mdn 4731064

MDN GROUP
-----

HOST 01 1 09 19 KEY 1    BEARER NET: ENET ENET

There is no Primary member associated with this group.
Member HOST 01 1 09 19 has the following options :
CPU 0 HOST 01 1 09 19 1
CUSTOMER GROUP OPTIONS:
AIN CDPCODE
OFFICE OPTIONS:
AIN TIID

The number of members in the SCA MDN GROUP is 1.

>qgrp mdn HOST 01 1 09 19
KEY:
>1
LEN AND KEY NOT A MEMBER OF INTERCOM GROUP

MDN GROUP
-----

HOST 01 1 09 19 KEY 1    BEARER NET: ENET ENET

4164731064 : IS MDN DN
There is no Primary member associated with this group.
Member HOST 01 1 09 19 has the following options :
CPU 0 HOST 01 1 09 19 1
CUSTOMER GROUP OPTIONS:
AIN CDPCODE
OFFICE OPTIONS:
AIN TIID

The number of members in the SCA MDN GROUP is 1.

>qgrp mdn 4164731064

MDN GROUP
-----

HOST 01 1 09 19 KEY 1    BEARER NET: ENET ENET

There is no Primary member associated with this group.
Member HOST 01 1 09 19 has the following options :
CPU 0 HOST 01 1 09 19 1
CUSTOMER GROUP OPTIONS:
AIN CDPCODE
OFFICE OPTIONS:
AIN TIID

The number of members in the SCA MDN GROUP is 1.

>
```

### 2.9.1.8 QCUST

QCUST command displays all Line Equipment Numbers (LENs) corresponding to a Customer Group. The command output is enhanced to display the corresponding Bearer Network against each of the LENs.

The command output is enhanced such that the Bearer Network information for each LEN in a Customer Group is displayed against the LEN in the QCUST output.

A new Line of output (RECORD 22 i.e. We have “22” at start of LINE) showing **BEARERNET** field is introduced in the QCUST command output against each LEN.

The format of the new field BEARERNET is as follows:

#### 22 BEARERNET: <FABRIC> <DISPLAY>

where,

- **DISPLAY**: Value datafilled in DISPLAY field of the table BEARNETS tuple, corresponding to the Bearer Network to which the LEN belongs.
- **FABRIC**: Value datafilled in FABRIC field of the table BEARNETS tuple, corresponding to the Fabric of the Bearer Network to which the LEN belongs.

These enhancements hold for the whole of the command menu applicable to QCUST command. The Command menu being:

```
COMMAND QCUST : QUERY CUSTOMER DATA
COMMAND FORMAT : QCUST <CUSTGRP> $
                  OR
                  QCUST LEN <LINE EQUIPMENT NUMBER/
                  LOGICAL TERMINAL IDENTIFIER>
                  OR
                  QCUST ALL
                  OR
                  QCUST OWNEDBY <CUSTNAME> INITIAL
                  OR
                  QCUST ALL <CUSTNAME> INCR
                  OR
                  QCUST ALL <CUSTNAME> DONE
```

### 2.9.1.8.1 Examples:

**Figure 41 Enhanced QCUST command output**

```

CI>qcust all
0 55 Y 4 Y N
99
18 ISDN
18 FUNC
.....
18 BRI_TRAF
99
19 PUBLIC 0
19 PRIVATE 1
99
1 RDT1 45 0 00 13 M5316 NPDGP RDTEBS N
4 $
5 1 5200013 NT520 0 0 214 Y
22 BEARER NET: IP IP_P
99
.....
99
17 FUNC 5 B BRAFS VOICE VBD CMD PVC FUNCTIONAL 2 DTEI TSPID 6137223003 $ Y RDT
1 24 0 00 94 $ N
1 FUNC 5 ISDNKSET NPDGP RDTISD N
4 60 $
5 1 7223003 THE_FAR_SIDE 0 0 613 Y
9 LNR SFC $
10 1 NAME PUBLIC YOMAMA
22 BEARER NET: AAL1 A1_P
The number of members in the HUNT GROUP is 4.

```

### 2.9.1.9 Restrictions & Special Cases

The Line Query Command Enhancements described in this Section **do not** apply to following:

- MTX DNs/LENs
- Cellular DNs/LENs
- Synonym DNs/LENs
- Virtual DNs
- Unassigned and free DNs
- DNs not associated to a LEN
- GSF DNs/LENs

These Enhancements are aimed at the North American (NA) Markets. It is not supported for MSL loads and other non-NA loads

These enhancements become active only when value datafilled for table OFCVAR Parm OSS\_PROV\_VERSION is greater than SN07

The Enhancements to QLEN command do not hold true for LEN corresponding to Free slot i.e. without a Line Card physically present in slot, of the 2 Slots in a two slot Line Card

For QGRP Command Options enhanced, if a given DN is not attached to a LEN, in place of the “BEARER NET: “field display, following will be displayed: “UNATTACHED TO A LEN”

For Offices with a JNET:-

- The BEARER NET field in enhanced command puts for QDN, QLEN, QCUST, QGRP (Options enhanced), QLT commands will be as follows:- “BEARER NET: JNET “
- The Displayed options list for BEARNETWORK Command Parm for QDNWRK, QLENWRK and QHASU commands will contain only “ALL”

## 2.9.2 Sample Datafills for PM MAP level and other MAP level enhancements described below

**Figure 42 Sample BEARNETS table datafill**

```
TABLE: BEARNETS
<line length>: 76 columns can be output per line.
<pack mode>: Pack mode is ON.
<indent column>: Indented lines will begin in column 1.
<first column>: The first column of output is column 1.
TOP
NETIDX  BNETNAME                DISPLAY  FABRIC  OPTIONS
-----
--
NET 0    TDM_ENET                ENET     ENET     $
NET 1    AAL1_PRIMARY             A1_P     AAL1     (PKT_NETWORK_DEFAULT ) $
NET 2    AAL1_SECONDARY           A1_S     AAL1     $
NET 3    IP_PRIMARY               IP_P     IP       $
NET 4    IP_SECONDARY             IP_S     IP       $
```

**Figure 43 Sample NETBRDGE table datafill**

```
TABLE: NETBRDGE
<line length>: 76 columns can be output per line.
<pack mode>: Pack mode is ON.
<indent column>: Indented lines will begin in column 1.
<first column>: The first column of output is column 1.
TOP
BRDGCCLI  BRDGTYPE  DISPLAY BEARNETS
-----
ENET_TO_AAL1_PRI  CORE_BRDGE  E_AP     TDM_ENET  AAL1_PRIMARY
ENET_TO_AAL1_SEC  CORE_BRDGE  E_AS     TDM_ENET  AAL1_SECONDARY
```



## 2.9.3 Directory: PMLEVEL

This feature enhances a command in the PMLEVEL directory, but does not modify the directory itself.

### 2.9.3.1 Directory description

The commands in this directory help operating company personnel to operate and maintain the Peripheral Module (PM) at the node level.

### 2.9.3.2 Accessing directory: PMLEVEL Directory

#### 2.9.3.2.1 Access to directory or MAP level and return to CI

To access the PMLEVEL level from the CI environment, type:

```
>MAPCI ; MTC ; PM ;
```

To return to the CI environment, type:

```
>QUIT ALL
```

## 2.9.4 Command: POST

### 2.9.4.1 Command type: Listed MENU

### 2.9.4.2 Command target: All

### 2.9.4.3 Command availability: RES

### 2.9.4.4 Command description

The POST command Displays the Peripheral Modules. This command is used to post the various Peripheral modules for Maintenance.

This feature introduces a new parameter PM BEARNETS. This parameter in POST command allows the craft to post all the PMs hosted on a given bearer network. The valid entries for this new parameter are the entries for the bearer network in the table BEARNETS.

The PMs can be posted by:

- Bearer network and PM type. The PM type allowed is limited to SPM type for this release.
- The PMs can be posted by Bearer network and PM type and the SPM node class type. The SPM node class types allowed is limited to SMG4 and IWDPT type of SPMs for this release.

Following is not supported(Description given further below, can be referred to for more details):

- The PMs being posted by Bearer network *and* PM type *and* the PM state.
- The PMs being posted by Bearer network *and* PM type *and* the PM alarm.

### 2.9.4.5 Command syntax

The command syntax is as shown in Figure 44.

**Figure 44 PM POST command syntax**

```
Post:Post specified PMs for maintenance
Parms: [<All PMs> {AllPMs}]
      [<PM Type>... {TM2 [<All> {All}]
      .....
      [<PM State>... {SysB,
      .....
      InSv}}]
      [<PM Alarm>... {Minor,
      Major,
      Crit}]
      [<BN> {A1_P [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]]}]
      A1_S [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]],
      IP_P [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]],
      IP_S [<PM Type> {SPM [<SPM Type> {SMG4,
      DPT}}]]}]
```

**Note:** The Parms <PM Type> and the Parm <BN> cannot be used together.  
E.g. POST SPM BN 0 is invalid command.

**Figure 45 PM POST command parameters and variables**

| Command                  | Parameters and variables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POST                     | <pre>Parms: [&lt;All PMs&gt; {AllPMs}]       [&lt;PM Type&gt;... {TM2 [&lt;All&gt; {All}]       .....       [&lt;PM State&gt;... {SysB,       .....       InSv}}]       [&lt;PM Alarm&gt;... {Minor,       Major,       Crit}]       [&lt;BN&gt; {A1_P [&lt;PM Type&gt; {SPM [&lt;SPM Type&gt; {SMG4,       DPT}}]]}]       A1_S [&lt;PM Type&gt; {SPM [&lt;SPM Type&gt; {SMG4,       DPT}}]],       IP_P [&lt;PM Type&gt; {SPM [&lt;SPM Type&gt; {SMG4,       DPT}}]],       IP_S [&lt;PM Type&gt; {SPM [&lt;SPM Type&gt; {SMG4,       DPT}}]]}]</pre> |
| Parameters and variables | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| PM BEARNETS              | <p>Value datafilled in DISPLAY field of a table BEARNETS tuple corresponding to a Bearer network. This command posts all the PMs hosted on the corresponding bearer network.</p> <p>E.g. POST A1_P posts all the PMs which are on the Bearer network corresponding to the table BEARNETS tuple, which has the value A1_P datafilled in the DISPLAY field.</p>                                                                                                                                                                                           |

**Figure 45 PM POST command parameters and variables**

| Command | Parameters and variables                                                                                                            |
|---------|-------------------------------------------------------------------------------------------------------------------------------------|
| PM Type | (optional) SPM [Currently only SPM is supported]. This command posts all the SPMs on the specified network.                         |
| Class   | (optional) SPM node class. This command posts all the SPMs of the specified class and Bearer network data filled in the DMS Switch. |
| SMG4    | Post all the SMG4 class SPM nodes hosted on the Switch                                                                              |
| DPT     | Post all the DPT class SPM nodes hosted on the Switch                                                                               |

#### **2.9.4.6 Qualifications and warnings**

No warnings are displayed.

#### **2.9.4.7 Responses**

Neither the POST command nor any of its options have required parameters; therefore, the user is never prompted for additional information when issuing any variant of the POST command.

##### **2.9.4.7.1 POST <BN> response**

The command and response for 'POST <BN>' is as shown in Table 4, "MAP outputs for POST <PM BEARNETS> with associated meanings and actions," on page 880.

**Table 4 MAP outputs for POST <PM BEARNETS> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POST <BN>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>RESPONSE:</b><br><br>All the PMs hosted on the bearer network corresponding to the table BEARNETS tuple whose DISPLAY field contains value specified as parameter, are posted.<br><br><b>Meaning:</b><br><br>The Parameter PM BEARNETS is the value datafilled in DISPLAY field of a table BEARNETS tuple corresponding to a Bearer Network. All the PMs hosted on the bearer network are posted as post-set at the MAP level. The MAP level is changed to the PM level of the first member in the post-set. The maintenance commands available off the specific PM MAP can be executed on this posted PM.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the specific PM MAP for maintenance can be executed. |

#### 2.9.4.7.2 POST <BN> response when an invalid entry for bearer network is given

The command and response for 'POST <BN>' is as shown in Table 5, "MAP outputs for POST <BN> with associated meanings and actions," on page 881.

**Table 5 MAP outputs for POST <BN> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POST BN NET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>RESPONSE:</b><br>"EITHER incorrect optional parameter(s) OR too many parameters.<br>Failed to create Post set"<br><br>MAP screen will remain at PM MAP.<br><br><b>Meaning:</b><br><br>The parameter given as bearer network [NET] is not a valid entry in the DISPLAY field of any table BEARNETS tuples. The valid entry for this is the contents of the DISPLAY field of a table BEARNETS tuple. So no PMs are posted for this command.<br><br><b>User actions:</b><br><br>The Craft has to give contents of DISPLAY field in any of the table BEARNETS tuples. Each tuple in table BEARNETS corresponds to a Bearer network. |

#### 2.9.4.7.3 POST <BN> <PM Type>

The command and response for 'POST <BN> <PM Type>' is as shown in Table 6, "MAP outputs for POST <BN> <PM Type> with associated meanings and actions," on page 882. SPM is the only PM Type supported for this release.

**Table 6 MAP outputs for POST <BN> <PM Type> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Command</b></p> <p>MAPCI;MTC;PM;</p> <p>POST &lt;BN&gt; &lt;PM Type&gt;</p> <p>POST &lt;BN&gt; SPM</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p><b>RESPONSE:</b></p> <p>All the SPMs hosted on the specified bearer network are posted.</p> <p><b>Meaning:</b></p> <p>The Parameter PM BEARNETS is the value datafilled in DISPLAY field of a table BEARNETS tuple corresponding to a Bearer Network. All the SPMs hosted on the specified bearer network are posted as post-set at the MAP level. The MAP level is changed to the SPM MAP level. The maintenance commands available off the SPM MAP can be executed on this posted SPM.</p> <p><b>System or user actions:</b></p> <p>N/A</p> <p><b>User actions:</b> Menu/Non menu commands available off the specific SPM MAP for maintenance can be executed.</p> |

#### 2.9.4.7.4 POST <BN> <PM Type>

The command and response for 'POST <BN> <PM Type>' when the PM Type is given as anything other than SPM is as shown in Table 7, "MAP outputs for POST <BN> <PM Type> with associated meanings and actions," on page 883. SPM is the only PM Type supported for this release.

**Table 7 MAP outputs for POST <BN> <PM Type> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POST <BN> SMA2                                                                                                                                                                                                                                                                                                                                              |
| <b>RESPONSE:</b><br>“EITHER incorrect optional parameter(s) OR too many parameters.<br>Failed to create Post set”<br><br>Map screen will remain at PM MAP.<br><br><b>Meaning:</b><br><br>The parameter given as PM Type is not a valid entry. The only valid entry for this release is SPM. So no PMs are posted for this command.<br><br><b>User actions:</b><br><br>The PM Type has to given as SPM. |

#### **2.9.4.7.5 POST <BN> SPM SMG4**

The command and response for ‘POST <BN> SPM SMG4’ is as shown in Table 8, “MAP outputs for POST <BN> SPM SMG4 with associated meanings and actions,” on page 884. SMG4 and DPT are the only SPM class Types supported for this release.

**Table 8 MAP outputs for POST <BN> SPM SMG4 with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POST <BN> SPM SMG4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>RESPONSE:</b><br><br>All the SPMs of node class type as SMG4 hosted on the specified bearer network are posted.<br><br><b>Meaning:</b><br><br>The Parameter PM BEARNETS is the value datafilled in DISPLAY field of a table BEARNETS tuple corresponding to a Bearer Network. All the SMG4 SPMs hosted on the specified bearer network are posted as post-set at the MAP level. The MAP level is changed to the SPM MAP level. The maintenance commands available off the SPM MAP can be executed on this posted SPM.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the specific SPM MAP for maintenance can be executed. |

#### **2.9.4.7.6 POST <BN> SPM DPT**

The command and response for 'POST <BN> SPM DPT' is as shown in Table 9, "MAP outputs for POST <BN>SPM DPT with associated meanings and actions," on page 885. SMG4 and DPT are the only SPM class Types supported for this release.



**Table 9 MAP outputs for POST <BN>SPM DPT with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POST <BN> SPM DPT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>RESPONSE:</b><br><br>All the SPMs of node class type as DPT hosted on the specified bearer network are posted.<br><br><b>Meaning:</b><br><br>The Parameter PM BEARNETS is the value datafilled in DISPLAY field of a table BEARNETS tuple corresponding to a Bearer Network. All the DPT SPMs hosted on the specified bearer network are posted as post-set at the MAP level. The MAP level is changed to the SPM MAP level. The maintenance commands available off the SPM MAP can be executed on this posted SPM.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the specific SPM MAP for maintenance can be executed. |

#### 2.9.4.7.7 POST <BN> SPM <class>

The command and response for 'POST <BN> SPM <class>' where the entry for parameter class is other than SMG4 or DPT is as shown in Table 10, "MAP outputs for POST <BN> SPM <class> with associated meanings and actions," on page 886. SMG4 and DPT are the only SPM class Types supported for this release.

**Table 10 MAP outputs for POST <BN> SPM <class> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POST <BN> SPM IW                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>RESPONSE:</b><br>“EITHER incorrect optional parameter(s) OR too many parameters.<br>Failed to create Post set”<br><br>MAP screen will remain at PM MAP.<br><br><b>Meaning:</b><br><br>The parameter given as SPM Node class Type is not a valid entry. The only valid entries for this parameter are SMG4 and DPT. So no PMs are posted for this command.<br><br><b>User actions:</b><br><br>The SPM Node class Type has to given as SMG4 or DPT. |

### 2.9.4.8 Examples

**Table 11 Examples for the POST command at PM MAP**

|                           |                                                                                                                                                                   |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description of task       | Post all the PMs hosted on an specified bearer network                                                                                                            |
| Command:<br>MAP response: | POST A1_P<br>A post-set with of all the PMs which are hosted on the bearer network which has “A1_P” datafilled in table BEARNETS tuple is created.                |
| Description of task       | Post all the SPMs hosted on an specified bearer network                                                                                                           |
| Command:<br>MAP response: | POST A1_P SPM<br>A post-set with of all the SPMs which are hosted on the bearer network which has “A1_P” datafilled in table BEARNETS tuple is created.           |
| Description of task       | Post all the SPM nodes by class SMG4 on specified bearer network                                                                                                  |
| Command:<br>MAP response: | POST A1_S SPM SMG4<br>A post-set with of all the SMG4 SPMs which are hosted on the bearer network which has “A1_S” datafilled in table BEARNETS tuple is created. |
| Description of task       | Post all the SPM nodes by class DPT on specified bearer network                                                                                                   |

|                           |                                                                                                                                                                 |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Command:<br>MAP response: | POST A1_P SPM DPT<br>A post-set with of all the DPT SPMs which are hosted on the bearer network which has "A1_P" datafilled in table BEARNETS tuple is created. |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 2.9.5 Command: POSTCLS

### 2.9.5.1 Command type: Hidden

### 2.9.5.2 Command target: All

### 2.9.5.3 Command availability: RES

### 2.9.5.4 Command description

This feature enhances an existing functionality POSTCLS at SPM level to post the PMTYPE by SPM node class type. This enables the craft to post the SPMs by the node class type (such as DMSCP, SMG4, IWDPT, IWB RG). The POST command, when posted by SPM node class type (E.g SMG4) creates a post set which contains all the SMG4 SPMs data filled in the DMS Switch.

### 2.9.5.5 Command syntax

The command syntax is as shown in Figure 46.

**Figure 46 POSTCLS command Enhancements**

```
POSTCLS: Post SPM by CLASS for maintenance.
Parms: <Class Type> {DMSCP,
                    IWB RG [<Netbrdge_clli>...{E_AP,E_AS}]
                    SMG4,
                    IWDPT}
```

**Figure 47 POSTCLS command parameters and Variables**

| Command                      | Parameters and variables                                                                                                                                                                |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POSTCLS                      | Parms: <Class Type> {DMSCP,<br>IWB RG [<Netbrdge_clli>...{E_AP,E_AS}]<br>SMG4,<br>IWDPT}                                                                                                |
| Parameters and variables     | Description                                                                                                                                                                             |
| <b>Class</b>                 | <b>(optional) SPM node class. This command posts all the SPMs of the specified class data filled in the DMS Switch.</b>                                                                 |
| DMSCP                        | Post all the DMSCP class SPM nodes hosted on the Switch                                                                                                                                 |
| IWB RG                       | Post all the IWB RG class SPM nodes hosted on the Switch                                                                                                                                |
| IWB RG<br><NETBRDGE_DISPLAY> | (optional) Post all the IWB RG class SPM nodes hosted on the Switch which use the Netbrdge CLLI, corresponding to the table NETBRDGE tuple whose DISPLAY field has the specified value. |
| SMG4                         | Post all the SMG4 class SPM nodes hosted on the Switch                                                                                                                                  |

| Command | Parameters and variables                                |
|---------|---------------------------------------------------------|
| IWDPT   | Post all the IWDPT class SPM nodes hosted on the Switch |

### 2.9.5.6 Qualifications and warnings

No warnings are displayed.

### 2.9.5.7 Responses

#### 2.9.5.7.1 POSTCLS <class> response when class is specified is DMSCP

The command and response for 'POSTCLS DMSCP' is as shown in Table 12, "MAP outputs for POSTCLS <class> with associated meanings and actions," on page 888.

**Table 12 MAP outputs for POSTCLS <class> with associated meanings and actions**

|                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b>                                                                                                                                                                   |
| MAPCI;MTC;PM;POST SPM;                                                                                                                                                           |
| POSTCLS DMSCP                                                                                                                                                                    |
| <b>RESPONSE:</b>                                                                                                                                                                 |
| Map screen will be at SPMDIR. The DMSCP SPMs data filled in the DMS switch are posted on the SPM MAP.                                                                            |
| <b>Meaning:</b>                                                                                                                                                                  |
| All the SPMs of SPM node class type as DMSCP are posted as post-set at the SPM MAP level. All the maintenance commands available off a SPM MAP can be executed on this post-set. |
| <b>System or user actions:</b>                                                                                                                                                   |
| N/A                                                                                                                                                                              |
| <b>User actions:</b> Menu/Non menu commands available off the SPM MAP for maintenance can be executed.                                                                           |

#### 2.9.5.7.2 POSTCLS <class> response when class is specified is SMG4

The command and response for 'POSTCLS SMG4' is as shown in Table 13, "MAP outputs for POSTCLS <class> with associated meanings and actions," on page 889.

**Table 13 MAP outputs for POSTCLS <class> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;POST SPM;<br><br>POSTCLS SMG4                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>RESPONSE:</b><br><br>Map screen will be at SPMDIR. The SMG4 SPMs data filled in the DMS switch are posted on the SPM MAP.<br><br><b>Meaning:</b><br><br>All the SPMs of SPM node class type as SMG4 are posted as post-set at the SPM MAP level. All the maintenance commands available off a SPM MAP can be executed on this post-set.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the SPM MAP for maintenance can be executed. |

#### **2.9.5.7.3 POSTCLS <class> response when class is specified is IWDPT**

The command and response for 'POSTCLS IWDPT' is as shown in Table 14, "MAP outputs for POSTCLS <class> with associated meanings and actions," on page 890.

**Table 14 MAP outputs for POSTCLS <class> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;POST SPM;<br><br>POSTCLS IWDPT                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>RESPONSE:</b><br><br>MAP screen will be at SPMDIR. The IWDPT SPMs data filled in the DMS switch are posted on the SPM MAP.<br><br><b>Meaning:</b><br><br>All the SPMs of SPM node class type as IWDPT are posted as post-set at the SPM MAP level. All the maintenance commands available off a SPM MAP can be executed on this post-set.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the SPM MAP for maintenance can be executed. |

#### **2.9.5.7.4 POSTCLS <class> response when class is specified is IWRG**

The command and response for 'POSTCLS IW ALL' is as shown in Table 15, "MAP outputs for POSTCLS <class> with associated meanings and actions," on page 891.

**Table 15 MAP outputs for POSTCLS <class> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;POST SPM;<br><br>POSTCLS IWBRG                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>RESPONSE:</b><br><br>Map screen will be at SPMDIR. All the IWBRG SPMs data filled in the DMS switch are posted on the SPM MAP.<br><br><b>Meaning:</b><br><br>All the SPMs of SPM node class type as IWBRG are posted as post-set at the SPM MAP level. All the maintenance commands available off a SPM MAP can be executed on this post-set.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the SPM MAP for maintenance can be executed. |

#### **2.9.5.7.5 POSTCLS <class> response when class is specified is IWBRG**

The command and response for 'POSTCLS IWBRG <NETBRIDGE\_DISPLAY>' is as shown in Table 16, "MAP outputs for POSTCLS <class> with associated meanings and actions," on page 892.

**Table 16 MAP outputs for POSTCLS <class> with associated meanings and actions**

|                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Command</b></p> <p>MAPCI;MTC;PM;POST SPM;</p> <p>POSTCLS IWB RG &lt;NETBRDGE_DISPLAY&gt;</p> | <p><b>RESPONSE:</b></p> <p>Map screen will be at SPMDIR. All the IWB RG SPMs data filled in table MNNODE, which use the Netbrdge CLLI in the DMS switch corresponding to the table NETBRDGE tuple having value specified for &lt;NETBRDGE_DISPLAY&gt; datafilled in the DISPLAY field, are posted on the SPM MAP.</p> <p><b>Meaning:</b></p> <p>The Parameter NETBRDGE_DISPLAY is the value data filled in the DISPLAY field of a table NETBRDGE tuple. All the SPMs of SPM node class type as IWB RG, which use the Netbrdge CLLI corresponding to the table NETBRDGE tuple, are posted as post-set at the SPM MAP level.The maintenance commands available off a SPM MAP can be executed on this post-set.</p> <p><b>System or user actions:</b></p> <p>N/A</p> <p><b>User actions:</b> Menu/Non menu commands available off the SPM MAP for maintenance can be executed.</p> |
|----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

#### 2.9.5.7.6 POSTCLS <class> response when specified class is not in the valid variables

The command and response for 'POSTCLS <class>' is as shown in Table 17, "MAP outputs for POSTCLS <class> with associated meanings and actions," on page 893.



**Table 17 MAP outputs for POSTCLS <class> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;POSTCLS;<br><br>POSTCLS SMG                                                                                                                                                                                                                                                                                                                                                                              |
| <b>RESPONSE:</b><br>postcls smg<br>Invalid symbol: <Class Type> {DMSCP,<br>IWBRG [<Netbrdge_clli>...{E_AP,E_AS}],<br>SMG4,<br>IWDPT}<br><br>Enter: <Class Type><br>Map screen will remain at PM MAP.<br><br><b>Meaning:</b><br>The parameter given as the node class type is invalid. So no PMs are posted for this command.<br><br><b>User actions:</b><br><br>The SPM node class type has to one of the types: DMSCP, SMG4, IWDPT, IWBRG. |

#### **2.9.5.7.7 POSTCLS IWBRG <NETBRDGE\_DISPLAY> response when specified Netbrdge DISPLAY field value is not a valid entry in any table NETBRDGE Tuple**

The command and response for 'POSTCLS IWBRG <NETBRDGE\_DISPLAY>' is as shown in Table 18, "MAP outputs for POSTCLS IWBRG <NETBRDGE\_DISPLAY> with associated meanings and actions," on page 894.

**Table 18 MAP outputs for POSTCLS IWBRG <NETBRDGE\_DISPLAY> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;PM;<br><br>POSTCLS IWBRG <NETBRDGE_DISPLAY>                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>RESPONSE:</b><br>“EITHER incorrect optional parameter(s) OR too many parameters.<br>Failed to create Post set”<br><br>MAP screen will remain at PM MAP.<br><br><b>Meaning:</b><br><br>The parameter given as NETBRDGE_DISPLAY is invalid or not datafilled in DISPLAY field of any table NETBRDGE tuple. So no PMs are posted for this command.<br><br><b>User actions:</b><br><br>The NETBRDGE_DISPLAY has to be value data filled in DISPLAY field of a table NETBRDGE tuple. |

### 2.9.5.8 Examples

**Table 19 Examples for the POSTCLS command at SPM MAP level**

|                           |                                                                    |
|---------------------------|--------------------------------------------------------------------|
| Description of task       | Post all the DMSCP SPM nodes                                       |
| Command:<br>MAP response: | POSTCLS DMSCP<br>A post-set with of all the DMSCP SPMs is created. |
| Description of task       | Post all the SMG4 SPM nodes                                        |
| Command:<br>MAP response: | POSTCLS SMG4<br>A post-set with of all the SMG4 SPMs is created.   |
| Description of task       | Post all the DPT SPM nodes                                         |
| Command:<br>MAP response: | POSTCLS IWDPT<br>A post-set with of all the DPT SPMs is created.   |
| Description of task       | Post all the IW SPM nodes                                          |
| Command:<br>MAP response: | POSTCLS IWBRG<br>A post-set with of all the IW SPMs is created.    |

|                           |                                                                                                                                                                                        |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description of task       | Post all the IW SPM nodes belonging to a Netbridge CLI whose corresponding table NETBRIDGE tuple's DISPLAY field contents are passed as parameter to the command.                      |
| Command:<br>MAP response: | POSTCLS IWBRG E_AP<br>A post-set with of all the IW SPMs using the NetBridge CLI corresponding to the table NETBRIDGE tuple whose DISPLAY field contains a value of "E_AP" is created. |

## 2.9.6 Directory: TTP MAP

This feature enhances a command in the TTP MAP directory, but does not modify the directory itself.

### 2.9.6.1 Directory description

The commands in this directory helps operating company personnel to operate and maintain the trunks at the TTP MAP level.

### 2.9.6.2 Accessing directory: TTP

#### 2.9.6.2.1 Access to directory or MAP level and return to CI

To access the TTP MAP level from the CI environment, type:

```
>MAPCI;MTC;TRKS;TTP;
```

To return to the CI environment, type:

```
>QUIT ALL
```

## 2.9.7 Command: POST

### 2.9.7.1 Command type: Listed MENU

### 2.9.7.2 Command target: All

### 2.9.7.3 Command availability: RES

### 2.9.7.4 Command description

The POST command Displays the trunk members. This command is used to post the various trunks for Maintenance.

This feature introduces a new parameter "BN" in the POST command to refine posted set of the trunks by a specified bearer network. This command can be used only on a already created post-set using any of the existing post commands. This enables the craft to use maintenance commands available at the TTP level on the trunk members of a specific bearer network.

### 2.9.7.5 Command syntax

The command syntax is as shown in "POST command at TTP MAP level with new parameters" on page 896.

**Figure 48 POST command at TTP MAP level with new parameters**

```

POST-- POST A NEW SET
Parms: [<SET TYPE> {T [<CLLI1> STRING
                        [<CNRI1> {0 TO 9999}}
                        [<....> STRING]},
      G <CLLI> STRING
        [<CLNR> {0 TO 9999}}
        [<TO> {TO}]]
      <CLNR> {0 TO 9999},
      ....
      WB <CLLI> STRING
        <CKTN> {0 TO 9999}},
      BN [<ENET> STRING]
          [<A1_P> STRING]
          [<A1_S> STRING]
          [<IP_P> STRING]

```

### Figure 49 TTP POST command parameters and variables

| Command                   | Parameters and variables                                                                               |
|---------------------------|--------------------------------------------------------------------------------------------------------|
| POST                      | Parms: BN [<ENET> STRING]<br>[<A1_P> STRING]<br>[<A1_S> STRING]<br>[<IP_P> STRING]<br>[<IP_S> STRING]] |
| Parameters and variables  | Description                                                                                            |
| BN                        | (optional) option to specify that the trunks are to be posted by bearer network.                       |
| BEARNETS_DISPLAY [STRING] | value datafilled in DISPLAY field of a table BEARNETS tuple                                            |

#### 2.9.7.5.1 POST BN <BEARNETS DISPLAY>

The command and response for ‘Post BN <BEARNETS\_DISPLAY>’ is as shown in Table 20, “MAP outputs for POST BN <BEARNETS\_DISPLAY> with associated meanings and actions,” on page 897.

**Table 20 MAP outputs for POST BN <BEARNETS\_DISPLAY> with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;TRKS;TTP;POST A IDL;<br><br>POST BN <BEARNETS_DISPLAY>                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>RESPONSE:</b><br><br>The trunk members in the given post-set hosted on the specified bearer network are posted on the TTP MAP.<br><br><b>Meaning:</b><br><br>All the trunks of a specified bearer network in the given post-set are posted at the TTP MAP level. All the maintenance commands available off a TTP MAP can be executed on this post-set.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Menu/Non menu commands available off the TTP MAP for maintenance can be executed. |

#### **2.9.7.5.2 POST BN <BEARNETS\_DISPLAY> when bearer network entered is invalid**

The command and response for 'Post BN <BEARNETS\_DISPLAY>' when a invalid bearer network is as shown in Table 21, "MAP outputs for POST BN NET with associated meanings and actions," on page 898.

**Table 21 MAP outputs for POST BN NET with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;TRKS;TTP;POST A IDL;<br><br>POST BN <INVALID BEARNETS_DISPLAY VALUE>                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>RESPONSE:</b><br>“EITHER incorrect optional parameter(s) OR too many parameters.”<br>PARM <no> INVALID<br>POST -- Wrong number of parameters.”<br><br><b>Meaning:</b><br><br>The entry for the BEARNETS_DISPLAY is either not data filled in the DISPLAY field of any table BEARNETS tuples or is invalid.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Craft has to enter a valid value from the DISPLAY fields of any datafilled BEARNETS tuples. |

#### **2.9.7.5.3 Repetitive use of POST BN <BEARNETS\_DISPLAY> is invalid**

The command and response for ‘Post BN <BEARNETS\_DISPLAY>’ when a invalid bearer network is as shown in Table 22, “MAP outputs for repetitive POST BN NET with associated meanings and actions,” on page 899.

**Table 22 MAP outputs for repetitive POST BN NET with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;TRKS;TTP;POST G <TRUNK NAME>;POST BN BNET<br><br>POST BN BNET                                                                                                                                                                                                   |
| <b>RESPONSE:</b><br>“REPOST FOR NEW CONDITIONAL SELECTION”<br><br><b>Meaning:</b><br><br>Repetitive use of POST BN command is invalid.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Craft has to repost the Trunk to post the members of the new Bearer Network |

#### **2.9.7.5.4 POST BN <BEARNETS\_DISPLAY> when no bearer network is entered**

The command and response for ‘Post BN <BEARNETS\_DISPLAY>’ when no bearer network is entered as shown in Table 23, “MAP outputs for POST BN with associated meanings and actions,” on page 900.

**Table 23 MAP outputs for POST BN with associated meanings and actions**

|                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Command</b><br><br>MAPCI;MTC;TRKS;TTP;POST A IDL;<br><br>POST BN                                                                                                                                                                                                                                                                                              |
| <b>RESPONSE:</b><br>“INVALID BEARER NETWORK ENTRY”<br><br><b>Meaning:</b><br><br>The selection of trunk members by bearer network is turned off.<br><br><b>System or user actions:</b><br><br>N/A<br><br><b>User actions:</b> Craft has to enter contents of the DISPLAY field in any of the table BEARNETS tuples, in the post BN command to activate it again. |

**Table 24 Examples for POST command at TTP MAP**

|                           |                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description of task       | Select all the trunk members hosted on a bearer network in the given post-set. The value datafilled in DISPLAY field of corresponding table BEARNETS tuple being passed to the Command as parameter. |
| Command:<br>MAP response: | POST BN A1_P<br>Selects all trunk members of Bearer Network, the table BEARNETS tuple corresponding to which has a value of A1_P datafilled in the DISPLAY field.                                    |

## 2.9.8 New CI Tool called QOSSVER available to User on Core

A new CI tool QOSSVER is made available to user on the Nortel Switch Core. This tool helps list the CAF ACTIDs of Nortel features delivered in a load which has OSS impact.

### 2.9.8.1 Help Command for Tool

**>q qossver**

Displays list of Feature ACTIDs introduced in a load, which impact OSS. If no parameters are passed, the list displayed is for value of Parm OSS\_PROV\_VERSION in table OFCVAR.

Parms: [<LOAD RELEASE> {ALL,  
                                   SN07,  
                                   SN08,  
                                   SN09,  
                                   SN10,  
                                   SN11,  
                                   SN12,



```
SN13,
SN14,
SN15,
SN16,
SN17}]
```

### 2.9.8.2 Response message on passing an invalid Parm

```
>qossvr sn60
EITHER incorrect optional parameter(s) OR too many parameters.
QOSSVER -- Wrong number of parameters.
```

### 2.9.8.3 Output when “ALL” Parameter is passed to Tool

Tool lists CAF ACTIDs of all OSS impacting features delivered in all loads.

As stated earlier the ACTID of the features has to be entered against appropriate load, by the Nortel design team delivering the feature in the software database used by tool on Core, via feature code.

In case the software database used by tool, does not have any Feature ACTIDs entered for a load: There are no messages to the user to the effect that there are no OSS impacting features in a load.

A sample output in SN08 load (This feature's actid A00006780 has been entered in software database against SN08):

```
>qossvr all
OSS Impacting Features in SN08 are:
A00006780
```

### 2.9.8.4 Output when a valid load within permitted range is passed as Parm to QOSSVER:

- If there are one or more ACTIDs entered in database against load

```
>qossvr sn08
OSS Impacting Features in SN08 are:
A00006780
```

- If there are on ACTIDs entered in database against load

```
>qossvr sn09
No OSS Impacting Features in SN09
```

### 2.9.8.5 Output when no Parameter is passed to tool

Tool prints out ACTIDs entered in database against a load, which is same as load datafilled as value of table OFCVAR parm OSS\_PROV\_VERSION

Outputs when no Parameter is passed to QOSSVER

- If value of the OFCVAR Parm is SN07(No feature ACTIDs in database against SN07)

```
>qossvr
No OSS Impacting Features in SN07
```

- If value of the OFCVAR Parm is SN08(ACTID of this feature i.e. A00006780 is entered in database against SN08)

```
>qossvr
OSS Impacting Features in SN08 are:
```

A00006780

## 2.9.9 User Responses for Table Control Operations

### 2.9.9.1 Table BEARNETS

#### 2.9.9.1.1 Tuple Addition Failure with Non-unique DISPLAY field

Attempting to add a tuple to table BEARNETS which includes a DISPLAY field value which is already used by an existing tuple in the table will be rejected as shown below.

Existing BEARNETS tuple

| NETIDX | BNETNAME | DISPLAY | FABRIC | OPTIONS |
|--------|----------|---------|--------|---------|
| NET 1  | NET_AAL1 | A1_P    | AAL1   | \$      |

```
>add net 4 NET_AAL2      A1_P      AAL1 $
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
DISPLAY field for a Bearer Network must be unique
TUPLE TO BE ADDED:
  NET 4                      NET_AAL3  A1_P  AAL1  $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
```

**Note:** Following are the Warning Messages provided to the user for a tuple in Table BEARNETS having a Non-Unique 'Display' field:

During TABXFR, the tuple will be transferred and the warning generated:

```
"DISPLAY fields in Table BEARNETS are not unique
Change the DISPLAY field values to be unique after RESTORE."
```

During TABAUDIT,

```
"DISPLAY fields in Table BEARNETS are not unique
Change the DISPLAY field values to be unique."
```

#### 2.9.9.1.2 Tuple Change Failure with Non-unique DISPLAY field

Attempting to change a tuple to table BEARNETS which includes a DISPLAY field value which is already used by an existing tuple in the table will be rejected as shown below. Assume existing BEARNETS tuple as shown in 2.8.9.1.1.

```
>pos net 0
  NET 0                      TDM_ENET  ENET  ENET  $
>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
BNETNAME: TDM_ENET
>
DISPLAY: ENET
>A1_P
FABRIC: ENET
>
```

```

OPTIONS:
>$
DISPLAY field for a Bearer Network must be unique
TUPLE TO BE CHANGED:
  NET 0          TDM_ENET    A1_P    ENET      $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

**Note:** Following are the Warning Messages provided to the user for a tuple in Table BEARNETS having a Non-Unique 'Display' field:

During TABXFR, the tuple will be transferred and the warning generated:

```

"DISPLAY fields in Table BEARNETS are not unique
Change the DISPLAY field values to be unique after RESTORE."

```

During TABAUDIT,

```

"DISPLAY fields in Table BEARNETS are not unique
Change the DISPLAY field values to be unique."

```

### 2.9.9.1.3 Tuple Addition Failure with Empty DISPLAY field

Attempting to add a tuple to table BEARNETS which includes an empty DISPLAY field value will be rejected as shown below.

```

>add net 7
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
BNETNAME:
>net_ip
DISPLAY:
>$
FABRIC:
>ip
OPTIONS:
>$
DISPLAY field value is not valid.
TUPLE TO BE ADDED:
  NET 7          NET_IP      $      IP      $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

**Note:** Following are the Warning Messages provided to the user for a tuple in Table BEARNETS having a Empty 'Display' field:

During TABXFR, the tuple will be transferred and the warning generated:

```

"DISPLAY fields of table BEARNETS tuples are empty
Change the DISPLAY field value to be non-empty after RESTORE."

```

During TABAUDIT,

```

"DISPLAY fields of table BEARNETS tuples are empty
Change the DISPLAY field value to be non-empty."

```

## 2.9.9.2 Table NETBRDGE

### 2.9.9.2.1 Tuple Addition Failure with Non-unique DISPLAY field

Attempting to add a tuple to table NETBRDGE which includes a DISPLAY field value which is already used by an existing tuple in the table will be rejected as shown below.

**Existing NETBRDGE tuple:**

```

BRDGCLLI      BRDGTYPE      DISPLAY      BEARNETS
-----
--
ENET_TO_AAL1  CORE_BRDGE      E_A1          TDM_ENET NET_AAL1

>add ENET_TO_AAL3 CORE_BRDGE E_A1 TDM_ENET NET_AAL1
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
DISPLAY field for a Bridge Pool CLLI should be unique
TUPLE TO BE ADDED:
      ENET_TO_AAL3 CORE_BRDGE      E_A1 TDM_ENET NET_AAL1
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

**Note:** Following are the Warning Messages provided to the user for a tuple in Table NETBRDGE having a Non-Unique 'Display' field:

During TABXFR, the tuple will be transferred and the warning generated:

“DISPLAY field of table NETBRDGE for a Bridge Pool CLLI is not unique  
Change the DISPLAY field value to be unique after RESTORE.”

During TABAUDIT,

“DISPLAY field of table NETBRDGE for a Bridge Pool CLLI is not unique  
Change the DISPLAY field value to be unique.”

**2.9.9.2.2 Tuple Change Failure with Non-unique DISPLAY field**

Attempting to change a tuple to table NETBRDGE which includes a DISPLAY field value which is already used by an existing tuple in the table will be rejected as shown below. Assume existing NETBRDGE tuple as shown in 12.8.9.2.1.

```

>pos ENET_TO_AAL2
      ENET_TO_AAL2 CORE_BRDGE      A2 TDM_ENET NET_AAL1
>cha
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
BRDGTYPE: CORE_BRDGE
>
DISPLAY: A2
>e_a1
BEARNETS: TDM_ENET NET_AAL1
>
DISPLAY field for a Bridge Pool CLLI should be unique
TUPLE TO BE CHANGED:
      ENET_TO_AAL2 CORE_BRDGE      E_A1 TDM_ENET NET_AAL1
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

**Note:** Following are the Warning Messages provided to the user for a tuple in Table NETBRDGE having a Non-Unique 'Display' field:

During TABXFR, the tuple will be transferred and the warning generated:

“DISPLAY field of table NETBRDGE for a Bridge Pool CLLI is not unique  
Change the DISPLAY field value to be unique after RESTORE.”

During TABAUDIT,

“DISPLAY fields in Table NETBRDGE are not unique  
Change the DISPLAY field values to be unique.”

### 2.9.9.2.3 Tuple Addition Failure with Empty DISPLAY field

Attempting to add a tuple to table NETBRDGE which includes an empty DISPLAY field value will be rejected as shown below.

```
>add enet_to_aal4
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>Y
BRDGTTYPE:
>CORE_BRDGE
DISPLAY:
>$
BEARNETS:
>TDM_ENET NET_AAL1
DISPLAY field of NETBRDGE tuple cannot be empty
TUPLE TO BE ADDED:
      ENET_TO_AAL4 CORE_BRDGE          $ TDM_ENET NET_AAL1
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
```

**Note:** Following are the Warning Messages provided to the user for a tuple in Table NETBRDGE having a Empty 'Display' field:

During TABXFR, the tuple will be transferred and the warning generated:

“DISPLAY fields of table NETBRDGE tuples are empty  
Change the DISPLAY field value to be non-empty after RESTORE.”

During TABAUDIT,

“DISPLAY fields of table NETBRDGE tuples are empty  
Change the DISPLAY field value to be non-empty.”

### 2.9.9.2.4 Bridge Pool Creation Failure

If, when attempting to add a tuple to table NETBRDGE, the attempt to create a Bridge Pool fails, the tuple will be rejected. The following warning will be displayed to the user.

“Bridge Pool Creation Failed for CLI”

### 2.9.9.2.5 NETBRDGE Tuple Deletion Success

When a tuple from table NETBRDGE is deleted successfully, the following message will be displayed to the user.

“DELETING BRIDGE POOL OBJECT”

### 2.9.9.3 Table MNNODE

Bridge Pool Creation / Deletion no longer happens during addition / deletion of IW SPM(BRGD\_ONLY)SPM Tuples in MNNODE table

The following message is no longer seen during deletion of MNNODE tuples for IW BRDG\_ONLY SPMs:

“DELETING BRIDGE POOL OBJECT”

## 2.10 OSSGate Interface Changes

Functionality changes described in Section 9.9 of this Section, i.e. Enhancements to Line Query Commands. Functionality changes Turning ON/OFF is controlled using a newly introduced table OFCVAR Parm OSS\_PROV\_VERSION. The enhancements are effective only when this Office Parameter has a value greater than SN07.

## 2.11 Security

Not Applicable.

# 3: Performance for A00006780

## 3.1 Performance management strategy

TRK2NET2 and TRK2NET1 OM tuples are allocated for all bearer networks provisioned in table BEARNETS, for each Trunk Group datafilled in table TRKGRP, i.e., even if there are no Trunk Members datafilled in table TRKMEM against the Trunk Group in a bearer network.

By allocating OM tuples for each bearer network of each trunk group, attempts to use a trunk group member of a particular bearer network fabric not provisioned for that trunk group will be pegged. This is done to assist in evaluating provisioning and engineering in a Trimodal Call Server environment.

## 3.2 Performance management tools and utilities

The TRK2NET2 and TRK2NET1 OM tuples can be seen by executing the following commands, when the value of table OFCVAR field MULTINET\_DISPLAY\_ACTIVE is set to Y:

- CI>omshow TRK2NET1 ACTIVE
- CI>omshow TRK2NET2 ACTIVE

## 3.3 Performance Measurements (PM), Operational Measurements (OM), and stats

The following is a list of the enhanced OM groups for the SN08 Trimodal Call Server feature A00006780:

- TRK2NET1
- TRK2NET2

### 3.3.1 PM, OM, and stats format

#### 3.3.1.1 TRK2NET1

**Component:** Trunks

**Performance Measurement Name:** TRK2NET1

**Description:** TRK2NET1 OM Group provides information for per-trunk group traffic analysis per bearer network. The OM group is modeled after group TRK. The TRK2NET1 OM group provides information on trunk traffic for each trunk group. The registers in TRK2NET1 count the following:

- routing attempts
- seizure attempts
- seize failures
- total trunk use
- busy state use

**History:**

This OM was created in SN08 under Feature ACT.A00003487.

The OM tuples creation/deletion mechanism for this OM Group is enhanced in SN08, under feature ACT.A00006780.

#### 3.3.1.2 TRK2NET2

**Component:** Trunks

**Performance Measurement Name:** TRK2NET2

**Description:** TRK2NET2 OM Group provides information for per-trunk group traffic analysis per bearer network. It contains extension registers for registers found in OM Group TRK2NET1.

**History:**

This OM was created in SN08 under Feature ACT.A00003487.

The OM tuples creation/deletion mechanism for this OM Group is enhanced in SN08, under feature ACT.A00006780.

### 3.3.2 TRK2NET1 OM Group

#### 3.3.2.1 OM description

TRK2NET1 OM Group provides information for per trunk group traffic analysis per bearer network. The OM group is modeled after group TRK. The TRK2NET1 OM group provides information on trunk traffic for each trunk group. The registers in TRK2NET1 count the following:

- routing attempts
- seizure attempts
- seize failures
- total trunk use
- busy state use

The OM groups OFZ and OTS provide office-wide traffic summaries for trunks. The OM groups OFZ2NET1 and OFZ2NET2 provide office-wide per bearer network traffic summaries for trunks.

### 3.3.2.2 Release history update

#### 3.3.2.2.1 Enhancement in Release SN07

TRK2NET1 OM group is new in SN07.

The addition of this new TRK2NET1 OM group is controlled by the value of a new SN07 office parameter, MULTINET\_DISPLAY\_ACTIVE. If this parameter is set to 'Y', then the tuples of the new TRK2NET1 OM group are displayed. If the parameter is set to 'N', then the tuples of the TRK2NET1 OM group are not displayed. The tuples of this OM group are created when the office parameter MULTINET\_DISPLAY\_ACTIVE is set to Y for the first time.

#### 3.3.2.2.2 Enhancement in Release SN08

In SN07, the tuples for TRK2NET1 OM Groups are allocated only for the bearer networks of the trunk group members data filled in table TRKMEM.

In SN08, TRK2NET1 OM tuples are allocated for all bearer networks provisioned in table BEARNETS for each Trunk Group datafilled in table TRKGRP, i.e., even if there are no Trunk Members against the Trunk Group in a bearer network.

- When a Bearer Network is datafilled in table BEARNETS, a TRK2NET1 OM tuple is added for every Trunk Group datafilled in table TRKGRP.
- When a Bearer Network is deleted from table BEARNETS, all corresponding TRK2NET1 OM tuples are deleted. This functionality is delivered in SN08.
- When a Trunk Group is added in table TRKGRP, a TRK2NET1 OM tuple is added for every Bearer Network datafilled in table BEARNETS.
- When a Trunk Group is deleted from table TRKGRP, all corresponding TRK2NET1 OM tuples are deleted.
- TRK2NET1 OM tuple creation and deletion does not happen during tuple addition/deletion in tables TRKOPTS and TRKMEM.
- The TRK2NET1 OM group is ignored by table OMKEYORD.



### 3.3.3 TRK2NET2 OM Group

#### 3.3.3.1 OM description

TRK2NET2 OM Group provides information for per trunk group traffic analysis per bearer network. It contains extension registers for registers found in OM Group TRK2NET1.

#### 3.3.3.2 Release history update

##### 3.3.3.2.1 Enhancements in Release SN07

TRK2NET2 OM group is new in SN07.

The addition of this new TRK2NET2 OM group is controlled by the value of a new SN07 office parameter, MULTINET\_DISPLAY\_ACTIVE. If this parameter is set to 'Y', then the new TRK2NET2 OM group is displayed. If the parameter is set to 'N', then the TRK2NET2 OM group is not displayed.

##### 3.3.3.2.2 Enhancements in Release SN08

In SN07, the tuples for TRK2NET2 OM Groups are allocated only for the bearer networks of the trunk group members data filled in table TRKMEM.

In SN08, TRK2NET2 OM tuples are allocated for all bearer networks provisioned in table BEARNETS, for each Trunk Group datafilled in table TRKGRP, i.e., even if there are no Trunk Members against the Trunk Group in a bearer network

- When a Bearer Network is datafilled in table BEARNETS, a TRK2NET2 OM tuple is added for every Trunk Group datafilled in table TRKGRP.
- When a Bearer Network is deleted from table BEARNETS, all corresponding TRK2NET2 OM tuples are deleted. This functionality is delivered in SN08.
- When a Trunk Group is added in table TRKGRP, a TRK2NET2 OM tuple is added for every Bearer Network datafilled in table BEARNETS.
- When a Trunk Group is deleted from table TRKGRP, all corresponding TRK2NET2 OM tuples are deleted.
- TRK2NET2 OM tuple creation and deletion does not happen during tuple addition/deletion in tables TRKOPTS and TRKMEM.
- The TRK2NET1 OM group is ignored by table OMKEYORD.

#### 3.3.4 Special Scenarios(SN08 Enhancement)

- Before associating TRK2NET2&TRK2NET1 OM Tuples against a Bearer Network (When a table BEARNETS tuple is added) or associating TRK2NET2&TRK2NET1 OM Tuples against a Trunk Group (When adding a table TRKGRP Tuple):

- A check is made in software to check if there is space left to be able to associate the required number of OM Tuples (Refer to Limitation Section in FN)
- If the above check fails i.e. there is not enough space left, then not even a single TRK2NET2 or TRK2NET1 OM Tuple is associated with the Bearer Network or Trunk Group (as the case may be)
- An appropriate Warning is given to the User (Refer to Limitation Section of FN document). This tells user how much is the space needed and how much of space is actually available
- This gives the User an option of freeing up required space, given that user knows the requirement. User can free up space as per his/her discretion, by deleting table BEARNETS or TRKGRP tuples.
- The SN08 Enhancement gives the User an option of doing a NIL Change on the BEARNETS or TRKGRP tuple (During addition of which User faced the OM Tuple space availability issue). This particular enhancement causes the Feature code to re-attempt trying to associate required number of TRK2NET2/TRK2NET1 OM Tuple against Bearer Network or Trunk Group (as case maybe). This re-attempt would succeed, if User has freed up space by deleting TRKGRP or BEARNETS tuples before attempting NIL Change
  - NIL Change operation on a Tuple means trying a REPLACE command on Tuple with none of the fields of TUPLE having a changed value.
  - *Note: Above enhancement in software of re-attempting association of the OM Tuples, is run even if it is a normal Tuple CHANGE operation and not a NIL Change operation only.*
- When an ONP is done from a SN07 or SN08 load (Without feature code) to a SN08 load (With feature code): Then the TRK2NET2 and TRK2NET1 OM Tuples found associated with Bearer networks and Trunk Groups *will be different* from those associated on DUMP side. *In some cases, TRK2NET2/TRK2NET1 OM Tuples existing on DUMP side for a Bearer network and Trunk Group, will be found missing after TABXFR on the RESTORE side.*
  - An example is:-
    - When we have 5 Bearer Networks provisioned on DUMP side and 4000 Trunk Groups datafilled in TRKGRP.
    - Without the feature code, we have TRK2NET2/TRK2NET1 OM Tuples associated with each of the Bearer Networks *only* for those Trunk Groups (say there are 4000 Trunk Groups) which have Members physically belonging to a Bearer Network. Due to this, the Max OM Tuple limit per OM Group is not hit.

- Now when TABXFR of table BEARNETS happens to a load with feature code: When the first 4 BEARNETS tuples are TABXFRed,  $4 * 4000 = 16000$  (Max OM Tuple limit per OM Group) is reached for TRK2NET2&TRK2NET1 OM Groups.
- When the 5th table BEARNETS tuple is TABXFRed, the feature code detects that there is no space to associate even a single TRK2NET2/TRK2NET1 OM Tuple against Bearer Network. Hence on RESTORE side, not even a single TRK2NET2/TRK2NET1 OM tuple exists for Bearer Network corresponding to 5th table BEARNETS tuple.
- Table OMKEYORD will ignore the TRK2NET1 and TRK2NET2 OM groups during an ONP. This means that table OMKEYORD cannot be used to reorder the TRK2NET1 and TRK2NET2 tuples for EADAS.
- During ONP, the HOLE tuples from the OM groups TRK2NET1 and TRK2NET2 are not transferred to the Table OMKEYORD. TRK2NET1 and TRK2NET2 related OMKEYORD tuples are ignored.





# SN08 Feature Deltas

***Product = CS 2000***

## **A00006893--TLS Support for NGSS**

### ***Functional Description***

TLS = Transport Level Security, a security protocol that enables secure data transmission between two communicating applications.

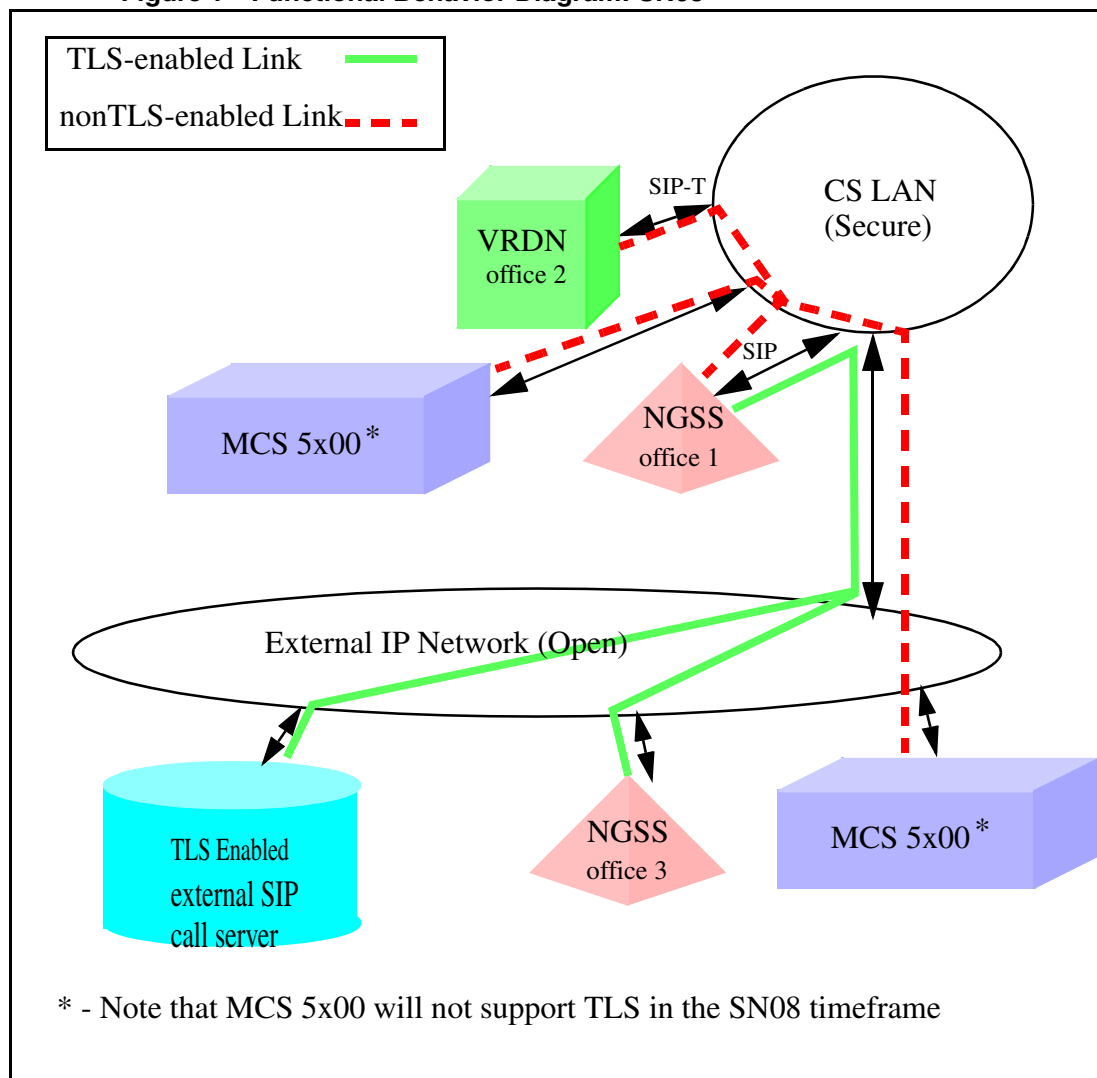
NGSS = Next Generation Session Server, a SIP CallP Server in Nortel's Succession Networks portfolio of products.

### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

### **1.2 Description**

The SIP RFC (3261) stipulates that TLS version 1.0 (RFC 2246) should be utilized for secure SIP message communication between two SIP enabled devices. This feature is meant to implement this functionality for the NGSS for Peer to Peer communication (i.e. Inter-call server communication). With the support of TLS by the NGSS, connections to a SIP enabled server can be secured over a non-secure network.

**Figure 1 Functional Behavior Diagram: SN08**

The TLS feature will allow the NGSS to establish TLS sessions with a remote Call Server that is SIP and TLS aware. Transport Layer Security (TLS) protocol provides secure communications over non-secured networks (like the internet). The protocol allows client/server applications to communicate with privacy, integrity, and communication. Beyond a simple implementation of TLS for the NGSS, capacity degradation is mitigated through connection throttling.

Provisioning decisions will enable non-TLS UDP or TCP connections to be established and utilized as required as well UDP or TCP.

On top of developing support for the TLS RFC, this feature will implement certain logs, OMs, and alarms for scenarios including security failures, attacks, and session establishment. It will also develop provisioning interfaces for

security-related provisioning. See the configuration (CN) and fault management (FM) sections for details on these interfaces.

### 1.3 Hardware Requirements or Dependencies

No new hardware dependencies are introduced in SN08.

### 1.4 Software Requirements or Dependencies

This feature requires only the standard SN08 load on the NGSS.

### 1.5 Limitations and restrictions

The following limitations exist for this feature:

#### Provisioning

- NGSS CallP must be restarted anytime a new server certificate is provisioned (CallP is not required to be restarted if remote servers' certificates are provisioned).
- NGSS CallP must be restarted for new values of many security-related parameters to take effect.
- Self-Signed Certificates from other servers must be datafilled on the NGSS in order to have the NGSS recognize those certificates.
- Any Self-Signed Certificate from the current NGSS must be datafilled on other NGSS'es -- and other SIP servers in general -- in order to have the remote servers recognize those certificates.

**Note:** Restarting NGSS CallP means restarting the SIP gateway application.

#### Provisioning: FQDN requirement for TLS.

- FQDN stands for "Fully Qualified Domain Name", a domain name that completely describes the address of a computer on the internet. It consists of at least a machine identifier (at the start) plus a top level domain (at the end). It may contain one or more subdomains in the middle. Example: www.nortel.com
- FQDNs are required to provision certificates for TLS under certain circumstances. According to RFC 3280, an FQDN must be no longer than 64 characters.
- Therefore the following limitations have been imposed on domain names for remote server provisioning on the NGSS in SN08:
  - New server names must be 64 or less characters (previous limit: 127 characters).
  - Previously provisioned server names cannot be longer than 64 characters if their provisioning is changed to use TLS. I.E. to use TLS, when the old server name is longer than 64 characters, the server must be renamed.

- The MGC server name on the NGSS Config Data page now has a size limit of 64 characters.

#### Performance

- Client-side session caching will not be supported on the NGSS. Server-side session-caching is supported. This will mean that session caching cannot be utilized between two SN08 NGSS units. Performance during mass session establishment events may be degraded as a result.

#### Cryptography

- Only RSA and AES ciphers will be enabled for use on the NGSS by default. These will be the only ciphers supported by Nortel on the NGSS. Specifically, the supported ciphers will be:
  - TLS1\_TXT\_RSA\_WITH\_AES\_128\_SHA and
  - TLS1\_TXT\_RSA\_WITH\_AES\_256\_SHA.
- RSA keys used on the NGSS will require a minimum of 1024 bits. RSA keys of smaller sizes are generally considered to be vulnerable to cracking.
- AES keys used on the NGSS will require a minimum of 128 bits.
- Imported certificates will be expected to be in PKCS #12 format, and coded in PEM, in order to be imported for use by the NGSS.

#### Licensing

- Licenses apply to certain open-source code (OpenSSL, Cryptlib) that we are using in the NGSS implementation of TLS. Terms of use require acknowledgement of the various authors in customer documentation materials etc. Please see appendix for full licenses of open-source code used within this product.

## 1.6 Glossary

| Term | Description                                                                                                                 |
|------|-----------------------------------------------------------------------------------------------------------------------------|
| FQDN | Fully Qualified Domain Name, a domain name that completely describes the address of a computer on the internet              |
| TLS  | Transport Level Security, a security protocol that enables secure data transmission between two communicating applications. |
| NGSS | Next Generation Session Server, a SIP CallP Server in Nortel's Succession Networks portfolio of products.                   |

## 1.7 References

- (a) RFC 2246 The TLS Protocol Version 1.0



## (b) RFC 3261 SIP: Session Initiation Protocol

**1.8 Appendix for A00006893**

## Open SSL license

```

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 *
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 *
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```

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```

```

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* The implementation was written so as to conform with Netscape's SSL.
*
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```

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-----  
Issue Date: 26/08/2003

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```
/* The random pool handling code in this module and the misc/rnd*.c modules
represent the cryptlib continuously seeded pseudorandom number generator
(CSPRNG) as described in my 1998 Usenix Security Symposium paper "The
generation of practically strong random numbers".
```

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## ***Fault Management for A00006893***

### **2.1 Fault management strategy**

The TLS security feature for the SIP Gateway application on the NGSS (Next Generation Session Server) includes new logs and alarms to be defined. This section details the logs and alarms that the TLS security feature has defined.

An alarm monitoring process will be used to compare thresholds values with current operating conditions. As alarmable conditions occur, the process will ensure that the appropriate alarm is raised.

## 2.2 Fault management tools and utilities

This feature utilizes the current log and alarm display mechanisms in use by the NGSS. There will be new alarms and logs defined, but there will not be any new display mechanisms. Refer the to documented activity (in pls fmdoc) A00003933 (Succession Communication Server (SCS) 2000 - Session Server 2000 - SIP Gateway application) for the overall log and alarm tools and utilities.

This feature generates logs and alarms under the purview of the SIP Gateway application Call Processing. These logs and alarms are only generated and reported on the SIP Gateway application.

They can be viewed via the SIP Gateway Maintenance web browser interface on the Session Server - SIP Gateway application web page. The body of log formats shown in this document are the format for the Session Server logs if viewed from the IEMS (Integrated Element Manager System). Log formats may differ if logs are viewed from the Session Server Web Interface. The content will not differ, just the format and/or the headers.

## 2.3 Logs

There are two logs associated with the certificate management (cert\_mgnt/cert\_mgmt) tool:

- CRTM700 - New private key requested
- CRTM701 - Self signed certificate requested

All other logs and associated alarms will have the name start with SIPS (for SIP Security).

The following log events will be defined in this section:

- SIPS601 - A TLS authentication failure (error reason)
- SIPS305 - Initialization - TLS initialization critical logs
- SIPS605 - Initialization - TLS security initialization completed
- SIPS604 - Initialization - A TLS information log for the Local Certificate expiration date
- SIPS600 - TLS connection request dropped reason
- SIPS606 - TLS attempt to add trusted CA failed
- SIPS607 - TLS connection request failed

The following logs are associated with alarms:

- SIPS300 - TLS dropped number of requests over time
- SIPS301 - TLS failed certificate authentications over time
- SIPS302 - TLS Local certificate is expiring soon

## 2.3.1 CRTM700: New private key requested

### 2.3.1.1 Formats

#### 2.3.1.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> cert_mgnt:CRTM700 <Severity>
<Type>CERT_MGNT<Log Message>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Severity>: The Severity of the log (NONE).
- <Type>: The type of log (INFO)
- <Log Message>:
  - none/info: “^M      User requested new private key.^M      Existing key moved to /opt/base/share/ssl/server.key.<HHMM>\_<DDMMYY>^M”

#### Example:

```
Nov 11 14:12:14 comit.ngss.unit0 cert_mgnt: CRTM700 NONE INFO CERT_MGNT ^M
User requested new private key.^M      Existing key moved to
/opt/base/share/ssl/server.key.1412_11112004^M
```

### 2.3.1.2 Explanation

During the execution of the cert\_mgnt tool either option 1 or option 2, the user requested a new private key. The existing private key is backed up within the /opt/base/share/ssl. The new private key is placed in /opt/base/share/ssl/server.key

### 2.3.1.3 Field descriptions

**Table 1: Field descriptions**

| Field         | Value             | Description                         |
|---------------|-------------------|-------------------------------------|
| <DATE>        | <Mon> <DD>        | Current date when the log occurred. |
| <Time>        | <HH>:<MM>:<SS>    | Current time when the log occurred. |
| <DeviceName>  |                   | Name of the session server.         |
| <Severity>    | NONE              | Severity level of the log           |
| <Type>        | INFO              | informational                       |
| <Log Message> | see bulleted list | Log message text.                   |

### 2.3.1.4 Action

On an info log, no immediate action is required.

### 2.3.1.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

### 2.3.1.6 Additional information

See tool output and TLS initialization logs to ensure that the new key and certificate was provisioned properly.

## 2.3.2 CRTM701: Self signed certificate requested

### 2.3.2.1 Formats

#### 2.3.2.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> cert_mgnt:CRTM701 <Severity>  
<Type>CERT_MGNT<Log Message>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Severity>: The Severity of the log (NONE).
- <Type>: The type of log (INFO)

- <Log Message>:
  - none/info: “^M User accepted disclaimer for generating self-signed certificates^M”

#### Example:

```
Nov 12 09:54:50 comit.ngss.unit0 cert_mgnt: CRTM701 NONE INFO CERT_MGNT ^M
User accepted disclaimer for generating self-signed certificates^M
```

### 2.3.2.2 Explanation

During the execution of the cert\_mgnt tool in option 1, the user selected to generate a self-signed certificate. Self-signed certificates carry a security risk because they are not signed by a trusted certificate authority and therefore cannot be authenticated by a certificate authority.

### 2.3.2.3 Field descriptions

**Table 2: Field descriptions**

| Field         | Value             | Description                         |
|---------------|-------------------|-------------------------------------|
| <DATE>        | <Mon> <DD>        | Current date when the log occurred. |
| <Time>        | <HH>:<MM>:<SS>    | Current time when the log occurred. |
| <DeviceName>  |                   | Name of the session server.         |
| <Severity>    | NONE              | Severity level of the log           |
| <Type>        | INFO              | informational                       |
| <Log Message> | see bulleted list | Log message text.                   |

### 2.3.2.4 Action

On an info log, no immediate action is required.

### 2.3.2.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

### 2.3.2.6 Additional information

See tool output and TLS initialization logs to ensure that the new key and certificate was provisioned properly.

## 2.3.3 SIPS601 - A TLS authentication failure (error reason)

### 2.3.3.1 Formats

#### 2.3.3.1.1 Syslog

Following is the format of the log:

<Date> <Time> <DeviceName> <process> SIPS601 <Severity> <Type> TLS  
certificate common name: <Common Name>, reason: <Log Message>

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <process>: process class that raised the log (sigpgwyappln:)
- <Severity>: The Severity of the log (MINOR).
- <Type>: The type of log (INFO)
- <Common Name>: The common name in the X.509 certificate that the remote side is presenting
- <Log Message>: “<message>”, where <message> is one of:
  - unable to get issuer certificate
  - unable to get certificate CRL
  - unable to decrypt certificate’s signature
  - unable to decrypt CRL’s signature
  - unable to decode issuer public key
  - certificate signature failure
  - CRL signature failure
  - certificate is not yet valid
  - CRL is not yet valid
  - certificate has expired
  - CRL has expired
  - format error in certificate’s notBefore field
  - format error in certificate’s notAfter field
  - format error in CRL’s lastUpdate field
  - format error in CRL’s nextUpdate field
  - out of memory
  - self signed certificate
  - self signed certificate in certificate chain
  - unable to get local issuer certificate



- unable to verify the first certificate
- certificate chain too long
- certificate revoked
- invalid CA certificate
- path length constraint exceeded
- unsupported certificate purpose
- certificate not trusted
- certificate rejected
- application verification failure
- subject issuer mismatch
- authority and subject key identifier mismatch
- authority and issuer serial number mismatch
- key usage does not include certificate signing
- unable to get CRL issuer certificate
- unhandled critical extension
- key usage does not include CRL signing
- unhandled critical CRL extension

**Example:**

```
Oct  8 16:36:56 comit.ngss.unit1 sipgwyappln: SIPS601 MINOR INFO TLS certificate  
common name: 47.129.118.195, reason: self signed certificate
```

**2.3.3.2 Explanation**

The SIPS601 log is generated during authentication failure events. The INFO log indicates the reason for the authentication failures.

**2.3.3.3 Field descriptions****Table 3: Field descriptions**

| Field        | Value          | Description                         |
|--------------|----------------|-------------------------------------|
| <DATE>       | <Mon> <DD>     | Current date when the log occurred. |
| <Time>       | <HH>:<MM>:<SS> | Current time when the log occurred. |
| <DeviceName> |                | Name of the session server.         |
| <Severity>   | MINOR          | Severity level of the log           |

**Table 3: Field descriptions**

| Field         | Value             | Description       |
|---------------|-------------------|-------------------|
| <Type>        | INFO              | informational     |
| <Log Message> | see bulleted list | Log message text. |

**2.3.3.4 Action**

On an info log, no immediate action is required.

**2.3.3.5 Associated Operational Measurements or Performance Measurements**

OM registers “TLS\_CONNECTION\_REQUESTS\_FAILED” and “TLS\_HANDSHAKE\_AUTHENTICATION\_FAILED” in group “SIPGW\_TLS”

**2.3.3.6 Additional information**

An excessive amount of authentication failures may have associated alarms. Verify alarms and OMs

**2.3.4 SIPS305: TLS Initialization logs****2.3.4.1 Formats****2.3.4.1.1 Syslog**

Following is the format of the log:

```
<Date> <Time> <DeviceName> siggyappln: SIPS305 <Severity> <Type>
TLS <Log Message>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Severity>: The Severity of the log (CRIT).
- <Type>: The type of log (INIT)
- <Log Message>:
  - crit/init: “^M TLS Local Key and Cert do not match^M”
  - crit/init: “^M TLS Failed client init^M”
  - crit/init: “^M TLS Local Key and Cert do not match^M”
  - crit/init: “^M TLS Failed Server init^M”
  - crit/init: “^M TLS Failed to load Certificate^M”

- crit/init: “^M TLS Failed to load Key^M”
- crit/init: “^M TLS Failed to Init^M”
- crit/init: “^M TLS Failed to get pointer^M”
- crit/init: “^M TLS Failed to create thread^M”

**Example:**

```
Feb  9 13:11:39 comit.ngss.unit1 sipgwyappln: SIPS305 CRIT INIT TLS ^M TLS
Failed to load Key^M
```

**2.3.4.2 Explanation**

The SIPS305 log is generated during the initialization of the Call Processing application (i.e. during the unlock). If one of the critical logs come out, it means that there is a problem with the initialization, and the application is unable to start.

**2.3.4.3 Field descriptions****Table 4: Field descriptions**

| Field         | Value             | Description                         |
|---------------|-------------------|-------------------------------------|
| <DATE>        | <Mon> <DD>        | Current date when the log occurred. |
| <Time>        | <HH>:<MM>:<SS>    | Current time when the log occurred. |
| <DeviceName>  |                   | Name of the session server.         |
| <Severity>    | CRIT              | Severity level of the log           |
| <Type>        | INIT              | initialization log.                 |
| <Log Message> | see bulleted list | Log message text.                   |

**2.3.4.4 Action**

On a critical severity log, check to ensure that the Certificate and Key provided to the call processing application are in the correct directory (as pointed to by the Database entry). Then ensure that the Certificate and Key files themselves are not corrupted or tampered with. Ensure that the certificate and key files are meant to be together (by running the cert\_mgnt tool). Alternatively contact the next level of support.

Once the problem is resolved, and the user ‘unlocks’ the application again, there will be 3 logs indicating resolution.

- SIPM500

```
Feb  9 13:15:40 comit.ngss.unit1 sipgwymtc: SIPM500 NONE INFO SIP Gateway
Application Maintenance State Change ^M      [Administrative : Locked      -
> Unlocked      ]^M      [Operational   : Enabled      -> Enabled      ]^M
[Control        : Not Suspended   -> Not Suspended   ]^M      [Procedural      :
Not Terminating -> Not Terminating]^M      [User Requested : Yes]^M      [Reason
: Unlock command issued]^M      [Web User ID      : mtc]^M
```

- SIPS605
- SIPS604

### 2.3.4.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

### 2.3.4.6 Additional information

Normally, the cert\_mgnt CLI will provision the certificate and key files properly. If this interface has not been run prior to the attempt to bring the call processing application in service, or has been run improperly, unexpected results could occur. Extra information as to the cause of the problem will likely reside in the initialization trace logs provided in the /opt/apps/logs directory (look for siptrace.<date>.server.<pid>).

## 2.3.5 SIPS605: TLS Initialization logs

### 2.3.5.1 Formats

#### 2.3.5.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> sipgwyappln: SIPS605 <Severity> <Type>
TLS <Log Message>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Severity>: The Severity of the log (NONE).
- <Type>: The type of log (INFO)
- <Log Message>:
  - none/info: “^M TLS Security Enabled^M”

#### Example:

```
Oct  8 15:17:07 comit.ngss.unit1 sipgwyappln: SIPS605 NONE INFO TLS ^M      TLS
Security Enabled^M
```

### 2.3.5.2 Explanation

The SIPS605 log is generated during the initialization of the Call Processing application (i.e. during the unlock). This log indicates that TLS has been enabled. Expect a SIPS604 log along with this log.

### 2.3.5.3 Field descriptions

**Table 5: Field descriptions**

| Field         | Value             | Description                         |
|---------------|-------------------|-------------------------------------|
| <DATE>        | <Mon> <DD>        | Current date when the log occurred. |
| <Time>        | <HH>:<MM>:<SS>    | Current time when the log occurred. |
| <DeviceName>  |                   | Name of the session server.         |
| <Severity>    | NONE              | Severity level of the log           |
| <Type>        | INFO              | informational.                      |
| <Log Message> | see bulleted list | Log message text.                   |

### 2.3.5.4 Action

On an info log, no immediate action is required.

### 2.3.5.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

### 2.3.5.6 Additional information

None.

## 2.3.6 SIPS604: TLS Initialization logs

### 2.3.6.1 Formats

#### 2.3.6.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> sipgwyappln: SIPS604 <Severity> <Type>
TLS <Log Message>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server

- <Severity>: The Severity of the log (NONE).
- <Type>: The type of log (INFO)
- <Log Message>:
  - none/info: “^M Local Certificate Expires: Year=<YYYY>, Month = <MM>, Day = <DD>^M”

#### Example:

Oct 8 15:17:07 comit.ngss.unit1 sipgwyappln: SIPS604 NONE INFO TLS ^M Local Certificate Expires: Year=2005, Month = 10, Day = 8^M

### 2.3.6.2 Explanation

The SIPS604 log is generated during the initialization of the Call Processing application (i.e. during the unlock). This log indicates when the current local certificate will expire.

### 2.3.6.3 Field descriptions

**Table 6: Field descriptions**

| Field         | Value             | Description                         |
|---------------|-------------------|-------------------------------------|
| <DATE>        | <Mon> <DD>        | Current date when the log occurred. |
| <Time>        | <HH>:<MM>:<SS>    | Current time when the log occurred. |
| <DeviceName>  |                   | Name of the session server.         |
| <Severity>    | NONE              | Severity level of the log           |
| <Type>        | INFO              | informational.                      |
| <Log Message> | see bulleted list | Log message text.                   |

### 2.3.6.4 Action

On an info log, no immediate action is required.

### 2.3.6.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

### 2.3.6.6 Additional information

None.

## 2.3.7 SIPS600 - TLS connection request dropped reason

### 2.3.7.1 Formats

#### 2.3.7.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> sipgwyappln: SIPS600 MINOR INFO TLS
<Log Message>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Log Message>:
  - “^M Dropped TLS Handshake request, monitor OMs^M”
  - “^M Dropped TLS Handshake request, TLS is not enabled. ^M”
  -

#### Example:

```
Oct 8 15:17:07 comit.ngss.unit1 sipgwyappln: SIPS600 MINOR INFO TLS ^M Dropped
TLS Handshake request, monitor OMs^M
```

### 2.3.7.2 Explanation

The SIPS600 log is generated during the connection set up of the Call Processing application. When the ‘monitor OMs’ log comes out, ensure that the threshold levels set for connection throttling are reasonable for the size of the office. If the ‘TLS is not enabled’ message comes out, ensure that the initialization of the call processing application worked correctly.

### 2.3.7.3 Field descriptions

Table 7: Field descriptions

| Field         | Value             | Description                         |
|---------------|-------------------|-------------------------------------|
| <DATE>        | <Mon> <DD>        | Current date when the log occurred. |
| <Time>        | <HH>:<MM>:<SS>    | Current time when the log occurred. |
| <DeviceName>  |                   | Name of the session server.         |
| <Log Message> | see bulleted list | Log message text.                   |

#### 2.3.7.4 Action

If the log comes out once or twice, it is likely a transient problem. Monitor the OM register “TLS\_CONN\_REQ\_DROP” in group “SIPGW\_TLS” and ensure that the event doesn’t continuously recur. If it does, check to ensure the threshold values for the TLS connections are set properly for the number of connections expected in the time period. If they are, check to ensure the integrity of the office LAN (as there might be an intruder on the network).

#### 2.3.7.5 Associated Operational Measurements or Performance Measurements

TLS\_CONNECTION\_REQUESTS\_DROPPED in OM group SIPGW\_TLS

#### 2.3.7.6 Additional information

None.

### 2.3.8 SIPS606 - TLS attempt to add trusted CA failed

#### 2.3.8.1 Formats

##### 2.3.8.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> sipgwyappln: SIPS606 NONE INFO TLS  
^M Failed to add Trusted CA name <name>^M
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <name>: Unique name used to indicate which trusted certificate provisioned via the web interface is having trouble loading.

##### Example:

```
Oct 8 13:41:47 comit.ngss.unit1 sipgwyappln: SIPS606 NONE INFO TLS ^M Failed  
to add Trusted CA name server^M
```

#### 2.3.8.2 Explanation

The SIPS606 log is generated when there is a problem importing the trusted certificate provisioned via the web interface in the database.



### 2.3.8.3 Field descriptions

**Table 8: Field descriptions**

| Field        | Value                                                                                         | Description                         |
|--------------|-----------------------------------------------------------------------------------------------|-------------------------------------|
| <DATE>       | <Mon> <DD>                                                                                    | Current date when the log occurred. |
| <Time>       | <HH>:<MM>:<SS>                                                                                | Current time when the log occurred. |
| <DeviceName> |                                                                                               | Name of the session server.         |
| <name>       | Trusted certificate name from the database, Table SECURITYCONFIGCERTS, item SECURITYCERTNAME. | Unique name from the database.      |

#### 2.3.8.4 Action

Since the certificate is not correct (i.e. it is unable to be loaded), try to re-provision the certificate (using a different name) or delete the certificate <name> and re-add it via the 'Add Remote Trusted Certificate' web interface.

#### 2.3.8.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

#### 2.3.8.6 Additional information

If this log comes out, and then authentication logs come out, it is likely due to the failure to provision the trusted certificate for the remote server. Retrieve the remote servers' public self-signed certificate and add it to the database via the web interface.

### 2.3.9 SIPS607 - TLS Connection Request Failed

#### 2.3.9.1 Formats

##### 2.3.9.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> sipgwyappln: SIPS607 NONE INFO TLS
Connection Request Failed: Server: <Server Name>, IP Address: <IP
Address>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date

- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Server Name>: The name of the remote certificate
- <IP Address>: The IP address of the remote server

**Example:**

```
Feb 16 09:53:44 comit.ngss.unit1 sipgwyappln: SIPS607 NONE INFO TLS Connection
Request Failed: Server: AURUM, IP Address: 47.129.118.195
```

**2.3.9.2 Explanation**

The SIPS607 log supplements the SIPS601 log. The SIPS607 is generated to provide details into which remote server is not able to connect with the local server.

**2.3.9.3 Field descriptions****Table 9: Field descriptions**

| Field         | Value                                                                                                                                                                                                                   | Description                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| <DATE>        | <Mon> <DD>                                                                                                                                                                                                              | Current date when the log occurred.                                                                       |
| <Time>        | <HH>:<MM>:<SS>                                                                                                                                                                                                          | Current time when the log occurred.                                                                       |
| <DeviceName>  |                                                                                                                                                                                                                         | Name of the session server.                                                                               |
| <Server name> | Name of the remote server as it is provisioned in the Remote SIP Server web page.<br><br>Table SIPSERVER, field: SERVERNAME where the corresponding field IPADDRESS1 matches the <IP Address> field in the SIPS607 log. | If this value is NULL, then there is no remote server name provisioned corresponding to the <IP Address>. |
| <IP Address>  | IP address of the remote server that is unable to connect with the local server.                                                                                                                                        | IP address of the remote server.                                                                          |

**2.3.9.4 Action**

No immediate action is required.

### 2.3.9.5 Associated Operational Measurements or Performance Measurements

OM registers “TLS\_CONNECTION\_REQUESTS\_FAILED” in group “SIPGW\_TLS”

### 2.3.9.6 Additional information

If the value of the server name is NULL, this log, together with the SIPS601 log indicates that the remote server is not provisioned locally.

If the value of the server name is not NULL, this log, together with the SIPS601 log, indicates the reason which remote server is not able to connect with the local server, and the reason why the remote server is not able to connect.

Verify provisioning of the remote server’s certificate on the remote side and on the local side.

If there is an excessive amount of SIPS601 and SIPS607 logs, monitor OMs and alarms.

## 2.3.10 SIPS300 - TLS dropped number of requests over time

### 2.3.10.1 Formats

#### 2.3.10.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> alarmd: SIPS300 <Severity> TBL TLS  
Dropped Connection Request NCGL=<DeviceName>;Unit=<Unit#>;SIPS  
<alarmmessage>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Severity>: The Severity of the log (NONE, MINOR, MAJOR, or CRIT).
- <Unit#>: The unit number assigned (either 0 or 1)
- <alarmmessage>: One of:
  - Dropped <number> Connections requests
  - Automatically cleared due to alarm generator process death
- <number>: The number of dropped requests.

**Example:**

Oct 6 20:19:53 comit.ngss.unit1 alarmd: SIPS300 MINOR TBL TLS Dropped Connection Request NCGL=comit.ngss.unit1;Unit=1;SIPS Dropped 10 Connections requests

### 2.3.10.2 Explanation

The SIPS300 log is generated during the alarming of dropped connection requests (due to either the threshold being crossed for throttling connections, or due to attempting to use TLS when TLS is not enabled). The severity of the alarm indicates the threshold that was crossed, 10 dropped connection requests in a minute for a MINOR, 50 dropped requests for a MAJOR, and 100 dropped requests (or more) for a critical. The alarm is raised for a minimum of 30 minutes.

### 2.3.10.3 Field descriptions

**Table 10: Field descriptions**

| Field          | Value                      | Description                                                                       |
|----------------|----------------------------|-----------------------------------------------------------------------------------|
| <DATE>         | <Mon> <DD>                 | Current date when the log occurred.                                               |
| <Time>         | <HH>:<MM>:<SS>             | Current time when the log occurred.                                               |
| <DeviceName>   |                            | Name of the session server.                                                       |
| <Severity>     | NONE, MINOR, MAJOR or CRIT | Severity level of the log                                                         |
| <Unit#>        | 0 or 1                     | The unit number of the platform                                                   |
| <alarmmessage> | see bulleted list          | Alarm log message text.                                                           |
| <number>       | internally generated.      | The number of dropped connections in the last time period (currently one minute). |

### 2.3.10.4 Action

If the log comes out monitor the OM register “TLS\_CONN\_REQ\_DROP” in group “SIPGW\_TLS” and ensure that the event doesn’t continuously recur. If it does, check to ensure the threshold values for the TLS connections are set properly for the number of connections expected in the time period. If they are, check to ensure the integrity of the office LAN (as there might be an intruder on the network). The log/alarm will be raised at least 30 minutes, and if the problem has ceased, the clear alarm log will be generated.

### 2.3.10.5 Associated Operational Measurements or Performance Measurements

OM register “TLS\_CONN\_REQ\_DROP” in group “SIPGW\_TLS”

### 2.3.10.6 Additional information

See “SIPS600 - TLS connection request dropped reason” on page 931.

## 2.3.11 SIPS301 - TLS failed certificate authentications over time

### 2.3.11.1 Formats

#### 2.3.11.1.1 Syslog

Following is the format of the log:

```
<Date> <Time> <DeviceName> <process> SIPS301 <Severity> TBL TLS  
Failed Authentication NCGL=<DeviceName>;Unit=<Unit#>;SIPS  
<alarmmessage>
```

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <process>: process class that raised the log (either sipgwyappln: or alarmd:)
- <Severity>: The Severity of the log (NONE, MINOR, MAJOR or CRIT).
- <Unit#>: The Unit number.
- <alarmmessage>:
  - Failed <number> certificate authentications
    - <number>: The number of times this event occurred in the last minute before the alarm was raised.
  - Automatically cleared due to alarm generator process death

#### Example:

```
Feb 9 13:03:50 comit.ngss.unit1 alarmd: SIPS301 CRIT TBL TLS Failed  
Authentication NCGL=yin;Unit=0;SIPS Failed 28 certificate authentications  
Feb 9 13:08:10 yin alarmd: SIPS301 NONE TBL TLS Failed Authentication  
NCGL=yin;Unit=0;SIPS Automatically cleared due to alarm generator process death
```

#### 2.3.11.2 Explanation

The SIPS301 log is generated during authentication failure events. The alarmd process log indicates the level of trouble (CRIT indicates a very serious problem, MINOR may be transient or the beginning of a series of authentication failures).

### 2.3.11.3 Field descriptions

**Table 11: Field descriptions**

| Field          | Value                       | Description                                                                       |
|----------------|-----------------------------|-----------------------------------------------------------------------------------|
| <DATE>         | <Mon> <DD>                  | Current date when the log occurred.                                               |
| <Time>         | <HH>:<MM>:<SS>              | Current time when the log occurred.                                               |
| <DeviceName>   |                             | Name of the session server.                                                       |
| <Severity>     | NONE, MINOR, MAJOR, or CRIT | Severity level of the log                                                         |
| <Unit#>        | 0 or 1                      | The unit number of the platform                                                   |
| <number>       | internally generated.       | The number of dropped connections in the last time period (currently one minute). |
| <alarmmessage> | see bulleted list           | Alarm log message text.                                                           |
| <Log Message>  | see bulleted list           | Log message text.                                                                 |

### 2.3.11.4 Action

On a critical severity log, check to ensure that the Certificate and Key provided to the call processing application are in the correct directory (as pointed to by the Database entry). Then ensure that the Certificate and Key files themselves are not corrupted or tampered with. Ensure that the certificate and key files are meant to be together (by running the cert\_mgnt tool). Alternatively contact the next level of support.

On an info log, no immediate action is required.

### 2.3.11.5 Associated Operational Measurements or Performance Measurements

OM registers “TLS\_CONNECTION\_REQUESTS\_FAILED” and “TLS\_HANDSHAKE\_AUTHENTICATION\_FAILED” in group “SIPGW\_TLS”

### 2.3.11.6 Additional information

To determine the exact subject, use of the sp2ktrace tool would be warranted. This type of activity should be undertaken with the supervision of Nortel Technical Support.

## 2.3.12 SIPS302 - TLS Local certificate is expiring soon

### 2.3.12.1 Formats

#### 2.3.12.1.1 Syslog

Following is the format of the log:

<Date> <Time> <DeviceName> alarmd: SIPS302 <Severity> TBL TLS

<Date> <Time> <DeviceName> alarmd: SIPS302 <Severity> TBL Local Certificate is Expiring Soon NCGL=<DeviceName>;Unit=<Unit#>;SIPS Local Certificate is Expiring Soon

Following are values/explanations of the variable values presented above:

- <Date>: Current date
- <Time>: Current time
- <DeviceName>: The name assigned to the Session Server
- <Severity>: The Severity of the log (NONE, MINOR, MAJOR or CRIT).

#### Example:

```
Oct 8 13:14:17 comit.ngss.unit0 alarmd: SIPS302 MINOR TBL TLS Local Certificate  
is Expiring Soon NCGL=comit.ngss.unit0;Unit=0;SIPS TLS Local Certificate is  
Expiring Soon
```

### 2.3.12.2 Explanation

The SIPS302 log is generated as a result of the alarm process check to ensure the Local Server certificate continues to be valid. The expiration date contained in the certificate is checked on a daily basis, and when the expiration of the certificate will occur within 31 days (MINOR), 15 days (MAJOR), or 5 days (CRIT), the alarm is raised, with this log. For certificates that have already expired, the CRIT alarm and log is generated, and authentication failures will be output for any connections that are attempted.

### 2.3.12.3 Field descriptions

Table 12: Field descriptions

| Field        | Value                      | Description                         |
|--------------|----------------------------|-------------------------------------|
| <DATE>       | <Mon> <DD>                 | Current date when the log occurred. |
| <Time>       | <HH>:<MM>:<SS>             | Current time when the log occurred. |
| <DeviceName> |                            | Name of the session server.         |
| <Severity>   | NONE, MINOR, MAJOR or CRIT | Severity level of the log           |

### 2.3.12.4 Action

With the cert\_mngt tool, create a new self-signed certificate (if using self-signed certificates) or generate a certificate signing request and then provision the result. Once this is done, lock/unlock the callp application (or perform a SWACT after locking/unlocking the inactive with the new certificate).

### 2.3.12.5 Associated Operational Measurements or Performance Measurements

Not applicable to this log.

### 2.3.12.6 Additional information

None.

## 2.4 Alarms

The following list of alarms will be provided:

- TLS connection request comes in above the connection throttle limit (and above the threshold for the alarm - the defined thresholds are: 10 for minor, 50 for major, and 100 for critical)
- TLS connection handshake failures (the thresholds are: 1 for minor, 2 for major, and 5 for critical)
- TLS local certificate expiration (expiry in 31 days or less - minor, 15 days or less - major, and 5 days or less - critical)

### 2.4.1 Connection Requests Dropped Alarm

#### 2.4.1.1 Integrated Element Manager GUI Fields

For each new log, populate the following table with the values displayed in the IEMS Alarm Manager GUI. (Non-legacy logs only).



**Table 13: IEMS Alarm GUI Field descriptions**

| Field           | Value                                             |
|-----------------|---------------------------------------------------|
| Severity        | NONE, MINOR, MAJOR, or CRIT                       |
| Category        | <i>APC_Communications</i>                         |
| LogName         | SIPS                                              |
| LogNumber       | 300                                               |
| EventType       | TBL                                               |
| EventLabel      | TBL                                               |
| ProbableCause   | <i>thresholdCrossed</i>                           |
| SpecificProblem | TLS Dropped Connection Request                    |
| BodyText        | Dropped <number> Connections requests<updatetext> |

BodyText explanation: The BodyText entry for the log will contain “Dropped <number> Connections requests”. However, over time, other events may occur, and the alarm BodyText will be updated with “Dropped <number> Connections requests in the last minute<updatetext>”, where <updatetext> is one of:

- “, <numberminor> Minor events since alarm creation” for Minor alarms
- “, <numbermajor> Major, <numberminor> Minor events since alarm creation” for Major alarms or
- “, <numbercritical> Critical, <numbermajor> Major, <numberminor> Minor events since alarm creation” for Critical alarms.

The original alarm log is not refreshed.

#### 2.4.1.2 Explanation

Description: The SIPS300 log is generated during the alarming of dropped connection requests (due to either the threshold being crossed for throttling connections, or due to attempting to use TLS when TLS is not enabled). The severity of the alarm indicates the threshold that was crossed, 10 dropped connection requests in a minute for a MINOR, 50 dropped requests for a MAJOR, and 100 dropped requests (or more) for a critical. The alarm is raised for a minimum of 30 minutes. See also the SIPS600 log for an associated log.

Severity: Escalating severity, Minor for 10 or more connection requests dropped, Major for 50 or more requests dropped, and Critical for 100 or more connection requests dropped.

### 2.4.1.3 Action

If the alarm comes out monitor the OM register “TLS\_CONN\_REQ\_DROP” in group “SIPGW\_TLS” and ensure that the event doesn’t continuously recur. If it does, check to ensure the threshold values for the TLS connections are set properly for the number of connections expected in the time period. If they are, check to ensure the integrity of the office LAN (as there might be an intruder on the network). The log/alarm will be raised at least 30 minutes, and if the problem has ceased, the clear alarm log will be generated.

### 2.4.1.4 Corresponding Clear Log

Log Title: SIPS300 with severity NONE.

## 2.4.2 Connection Authentication Failures Alarm

### 2.4.2.1 Integrated Element Manager GUI Fields

For each new log, populate the following table with the values displayed in the IEMS Alarm Manager GUI. (Non-legacy logs only).

**Table 14: IEMS Alarm GUI Field descriptions**

| Field           | Value                                                   |
|-----------------|---------------------------------------------------------|
| Severity        | NONE, MINOR, MAJOR, or CRIT                             |
| Category        | <i>APC_Communications</i>                               |
| LogName         | SIPS                                                    |
| LogNumber       | 301                                                     |
| EventType       | TBL                                                     |
| EventLabel      | TBL                                                     |
| ProbableCause   | <i>authenticationFailure</i>                            |
| SpecificProblem | Too many authentication failures over time.             |
| BodyText        | Failed <number> certificate authentications<updatetext> |

BodyText explanation: The BodyText entry for the log will contain “Failed <number> certificate authentications”. However, over time, other events may occur, and the alarm BodyText will be updated with “Failed <number> certificate authentications in the last minute<updatetext>”, where <updatetext> is one of:

- “, <numberminor> Minor events since alarm creation” for Minor alarms
- “, <numbermajor> Major, <numberminor> Minor events since alarm creation” for Major alarms or
- “, <numbercritical> Critical, <numbermajor> Major, <numberminor> Minor events since alarm creation” for Critical alarms.

The original alarm log is not refreshed.

#### 2.4.2.2 Explanation

Description: See “SIPS301 - TLS failed certificate authentications over time” on page 937.

Severity: See “SIPS301 - TLS failed certificate authentications over time” on page 937.

#### 2.4.2.3 Action

See “SIPS301 - TLS failed certificate authentications over time” on page 937.

#### 2.4.2.4 Corresponding Clear Log

Log Title: SIPS301 with severity NONE.

### 2.4.3 Local Certificate Expiry Alarm

#### 2.4.3.1 Integrated Element Manager GUI Fields

For each new log, populate the following table with the values displayed in the IEMS Alarm Manager GUI. (Non-legacy logs only).

**Table 15: IEMS Alarm GUI Field descriptions**

| Field           | Value                                                 |
|-----------------|-------------------------------------------------------|
| Severity        | NONE, MINOR, MAJOR, or CRIT                           |
| Category        | <i>APC_Communications</i>                             |
| LogName         | SIPS                                                  |
| LogNumber       | 302                                                   |
| EventType       | TBL                                                   |
| EventLabel      | TBL                                                   |
| ProbableCause   | <i>keyExpired</i>                                     |
| SpecificProblem | Local certificate is about to expire (or has expired) |
| BodyText        | TLS Local Certificate is Expiring Soon                |

#### 2.4.3.2 Explanation

Description: See “SIPS302 - TLS Local certificate is expiring soon” on page 939.

Severity: See “SIPS302 - TLS Local certificate is expiring soon” on page 939.

**2.4.3.3 Action**

See “SIPS302 - TLS Local certificate is expiring soon” on page 939.

**2.4.3.4 Corresponding Clear Log**

Log Title: SIPS302 with severity NONE.

**2.5 Related documentation**

n/a

***Configuration for A00006893*****3.1 Hardware and Software Requirements**

Hardware/software required is a standard NGSS with a standard SN08 software load.

**3.2 Initial Configuration**

A standard SN07 load is the initial configuration for TLS-enabled NGSS.

**3.3 Office/Subnet parameters (OP/SP) (CM & SESM)**

Not Applicable. NGSS-only feature.

**3.4 Upgrade Considerations****3.4.1 Dump and Restore (CM)**

None.

**3.4.2 Element Management Upgrade**

Additional steps will be required to provision a new single certificate for the NGSS Sip application, Apache (NCGL), and Tomcat (NGSS). This tool must be executed manually.

**3.4.3 Downgrade impact**

None.

**3.5 Data schema (DS) (CM, MIBS, RDB)**

Not applicable.

**3.6 Service Orders (SO) (CM & SESM)**

Not applicable.

**3.7 Software optionality control (SOC)**

Not applicable. TLS will be standard on all SN08+ NGSS loads.

## 3.8 Element Management

### 3.8.1 New/modified GUIs

Table 12 New or modified GUIs

| GUI name               | NEW, CHANGED, or DELETED |
|------------------------|--------------------------|
| NGSS Tomcat Web Server | Changed                  |

### 3.8.2 GUI information

#### 3.8.2.1 GUI: NGSS Tomcat Web Server

This GUI is an NGSS-specific management tool.

The changes made to this GUI consist of:

- The addition of a Security menu under the provisioning menu
- The addition of Security configuration parameters web page
- The addition of a Certificates menu
- The addition of the Display local server certificate web page
- The addition of the Display Trusted certificates web page
- The addition of the Add Trusted certificate web page

##### 3.8.2.1.1 Functional description

Changes to the NGSS Tomcat GUI are as follows:

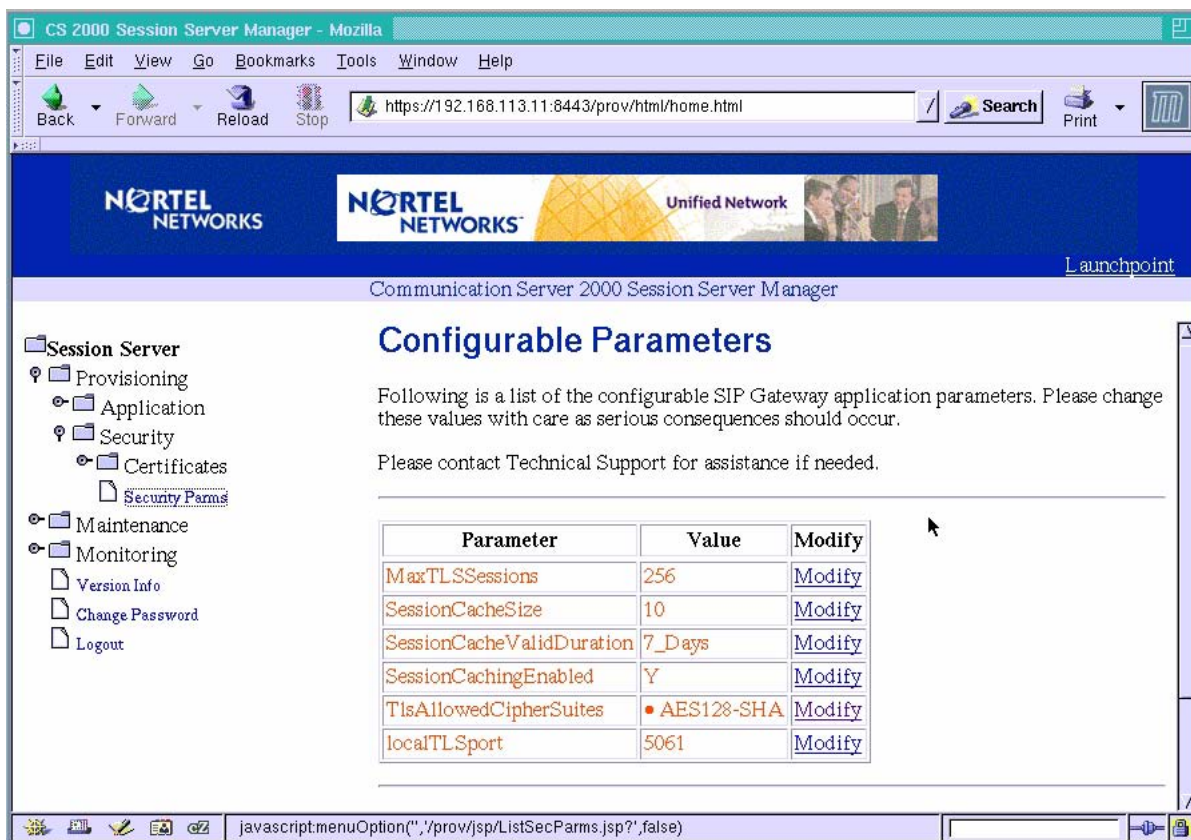
- A new “Security” subfolder has been added to the Provisioning folder of the Tomcat GUI.
- Under the “Security” subfolder a “Config Data” option has been added.
- Clicking on the “Security Params” option brings up the Security Params configuration page (see “Security Parameter Configuration Page” on page 946).
- Under the “Security” subfolder, a new “Certificates” subfolder has been added.
- Under the “Certificates” subfolder, the “Server Certificate”, “Remote Trusted Certificate”, and “Add Remote Trusted Certificates” options have been added.
- Clicking on the “Server Certificate” option brings up the Display Local Server Certificate page.
- Clicking on the “Remote Trusted Certificates” option brings up the Certificates Provisioned page.
- Clicking on the “Add Remote Trusted Certificates” option brings up the Add Trusted Certificate page.

- Changes to the “Add Server” and “Modify Server” section of the SIP Gateway GUI allow for the provisioning of servers using the TLS protocol, in addition to the TCP and UDP protocols.

### 3.8.2.1.2 GUI usage and implications

The purpose of the new Security Parameter Configuration Page is to change the values of the customer-accessible security parameters. From the table listed in the figure below, customers can choose to alter any of the visible parameters.

**Figure 2 Security Parameter Configuration Page**



This can be done in the following way:

- Clicking on any parameter option brings up a change screen for that parameter (see Figure 3 “Sample Pull-down Menu for Parameter Provisioning” on page 947, Figure 4 “Sample Text Input for Parameter Provisioning” on page 948, and Figure 5 “Sample Checklist Input for Parameter Provisioning” on page 949 below).
- Clicking on the “change” button on the change screen changes the value of that parameter in the NGSS SOLID database.

- Note that certain parameters (marked as Change Time = “CallP Restart” on the Configurable Parameters screen) require a restart of the NGSS CallP engine to effect the new parameter value.

A warning will be generated any time a security parameter is changed.

**Figure 3 Sample Pull-down Menu for Parameter Provisioning**

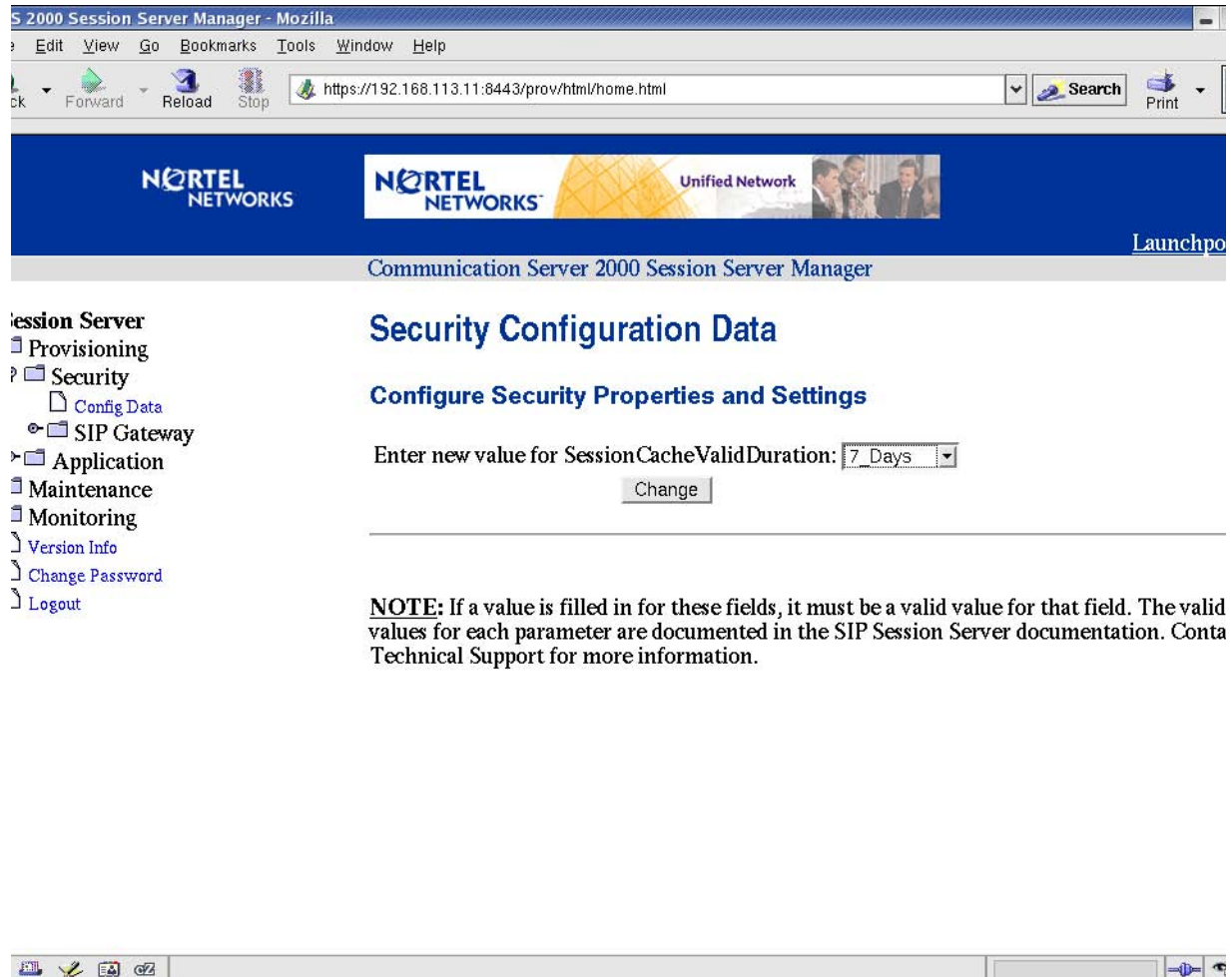




**Figure 4 Sample Text Input for Parameter Provisioning**

S 2000 Session Server Manager - Mozilla

Edit View Go Bookmarks Tools Window Help

Back Forward Reload Stop <https://192.168.113.11:8443/prov/html/home.html> Search Print

**NORTEL NETWORKS** **NORTEL NETWORKS** Unified Network 

Launchpo

Communication Server 2000 Session Server Manager

Session Server

- Provisioning
- Security
  - Config Data
  - SIP Gateway
- Application
- Maintenance
- Monitoring
- Version Info
- Change Password
- Logout

## Security Configuration Data

### Configure Security Properties and Settings

Enter new value for MaxTLSSessions:

---

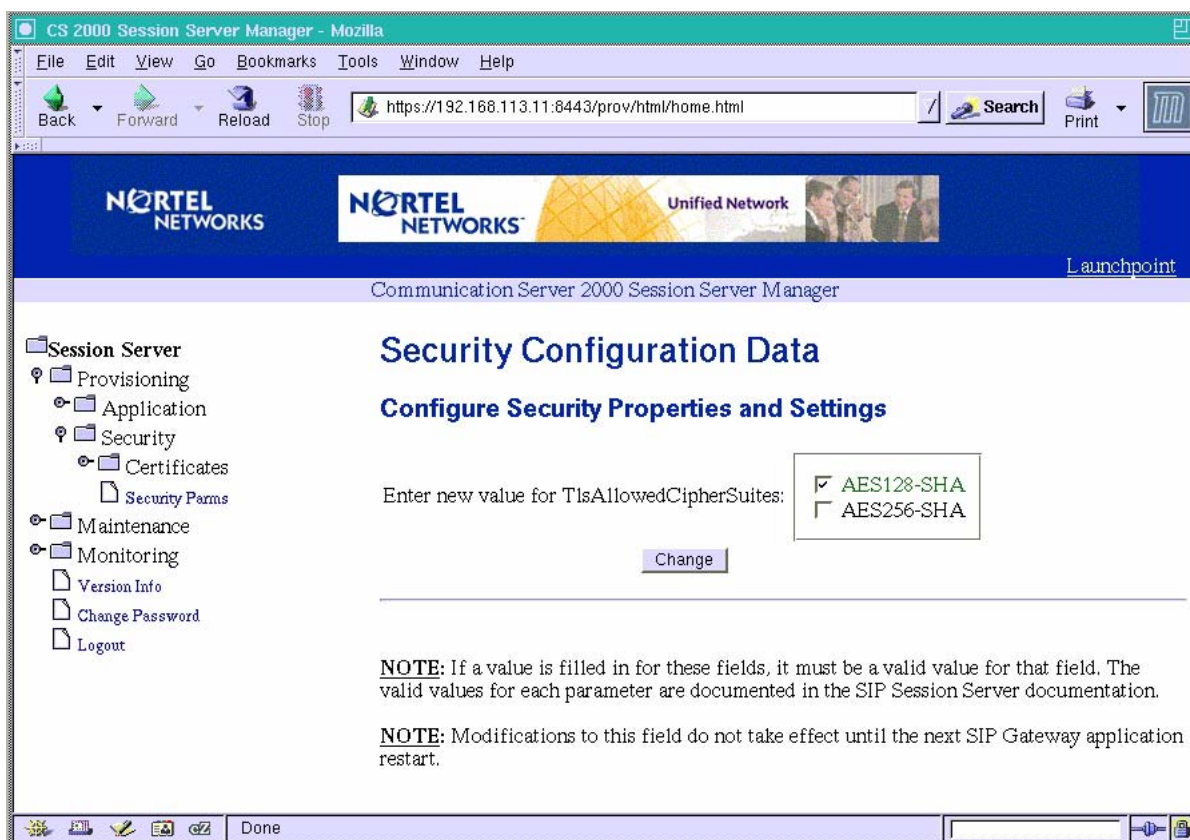
**NOTE:** If a value is filled in for these fields, it must be a valid value for that field. The valid values for each parameter are documented in the SIP Session Server documentation. Contact Technical Support for more information.

**NOTE:** Modifications to this field do not take effect until the next SIP Gateway application restart.

Done

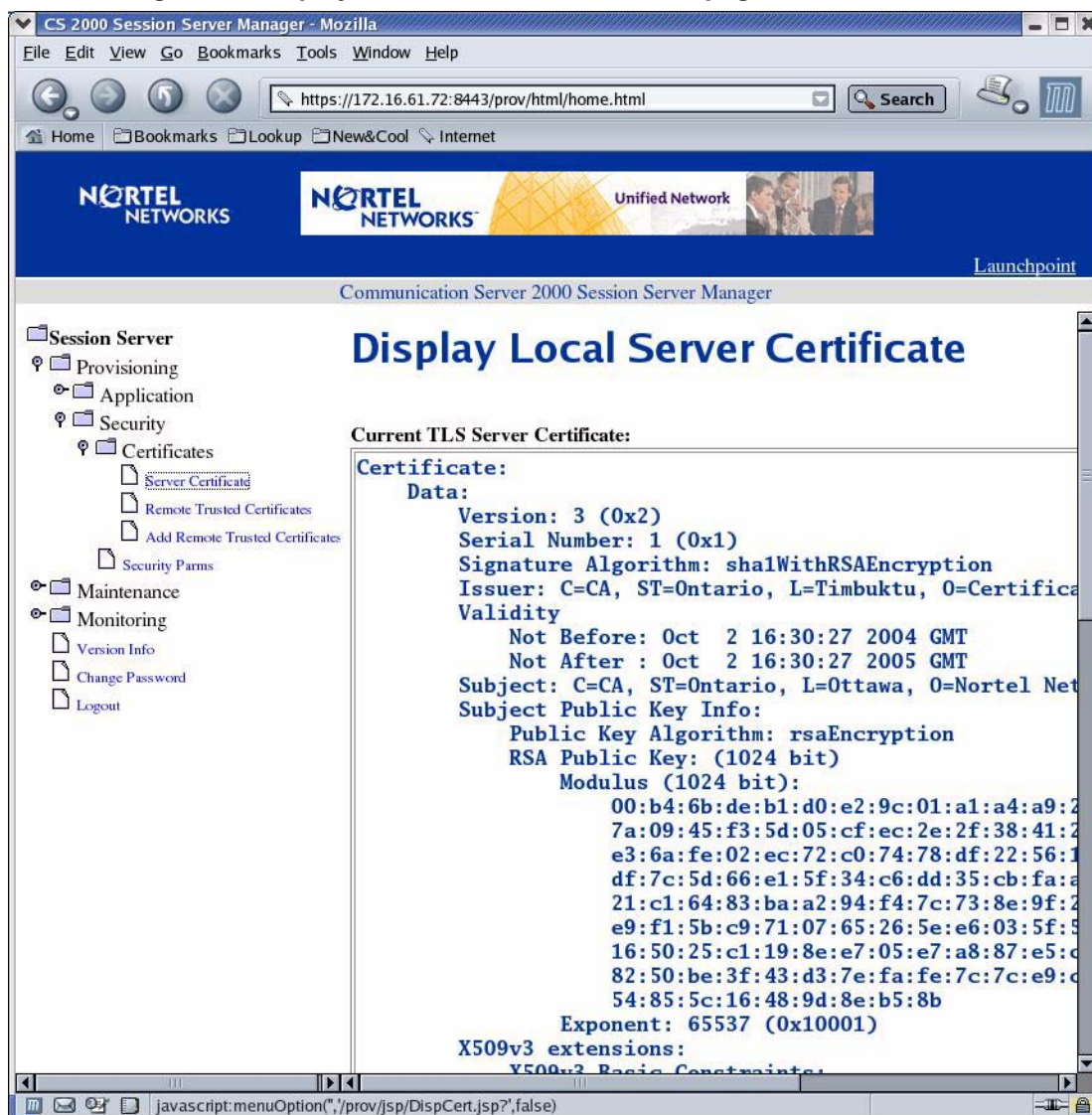
This GUI has default values set for the parameters that will allow the NGSS to operate properly with no datafill operations after the upgrade. Customers can change these values as needed.



**Figure 5 Sample Checklist Input for Parameter Provisioning.**

The parameters on these pages materially affect the behavior of TLS CallP and NGSS security. Changes to them can cause problems for the NGSS up to and including an outage, and/or leaving NGSS signalling data open to capture and/or attack. It is advised that only knowledgeable customer or Nortel representatives recommend changes to these values.

The purpose of the Display local server certificate web page is to provide an interface to retrieve the local certificate and drop it into a remote server's trusted certificate list (in the case of self-signed certificates). From the "Security" submenu, then the "Certificates" submenu, click the "Display Certificate" option (see Figure 6 "Display local server certificate web page" on page 950). Here, with a web page view to the Remote server, you could copy the certificate text as shown in the Display Certificate page, and paste it into the appropriate Remote Server's 'add trusted certificate' interface.

**Figure 6 Display local server certificate web page**

The purpose of the Display Trusted certificates web page is to provide an interface to view the current list of remote trusted certificates, and provide a way to remove them should the occasion arise. From the “Security” submenu, then the “Certificates” submenu, click the “Remote Trusted Certificates” option (see Figure 7 “Remote Trusted Certificates web page” on page 951). Each name in the list is unique, and to remove an item from the list, select the “Delete” option, at which point the craftperson would be asked to confirm the deletion and the request would then take place. If the confirmation is not granted, no action is taken.

**Figure 7 Remote Trusted Certificates web page**

**Certificates Provisioned**

This is a list of configured trusted certificates.

Deleting these certificates will take effect on the next application restart. Please contact Technical Support for assistance if needed.

| Certificate Name     | Certificate PEM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Delete                 |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| certificate_server_1 | <pre> -----BEGIN CERTIFICATE----- MIIDMTCAppqAwIBAgIBATANBgkqhkiG9wOBAQUFADBhMQswCQYDVQQGEwJDQTEQ MA4GA1UECBMT250YXJpbzERMA8GA1UEBxMIYVGlYnVrdHUxHjAcBgNVBAoTFUNl cnRpZmljYXR1IEF1dGhvcml0eTENMA8GA1UECxmETm9uZTAeFw0wNDEwMDI0NjMw MjdaFw0wNTEwMDI0NjMwMjdaMAxGA1UEAxMFMjdaFw0wNTEwMDI0NjMwMjda cm1vMQ8wDQYDVQQHEwZpZHRhd2ExGDAWBgNVBAoTD05vcnR1bCB0ZXR3b3JrczEN MA8GA1UECxmETkdTUzEVMBMGA1UEAxMFMjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEw MDI0NjMwMjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEwMDI0 NjMwMjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEwMDI0NjMw MjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEwMDI0NjMwMjdaFw0wNTEwMDI0NjMwMjda DQEBAAQAA4GNADCBiQKBgQCoA96x0OKcAaGkqSyYb3oJRfNdBc/sLi84QSBvY+Nq /gLscsBOeN8iVhY2n998XWbhXzTG3TXL+qayZyHBZIO6opT0fHO0ny2W++nxw81x B2UmXuYDX1+ktRZQJcEZjucF56iH5cNiJjQv9j9D0376/nx86ccIE1SFXBZInY61 iwIDAQABo4HpMIHmMakGALUdEwQCMaAwLAYJYIZIAyB4QgENBB8WU9wZ5TU0wG R2VuZXJhdGVkIENlcnRpZmljYXR1MBOGALUdDgQWBBTWXiqgr7d4Uo1MXX5Eqw5 oo3kSjCBiWYDVROjBIGDMIGAgBTL1FJssNnQD4ErOj//pQZ20wiVnaFlpGMwYTEL MAkGA1UEBhMCQOExEDAOBgNVBAgTB09udGFyaW8xETAPBgNVBACTCFRpbWJ1a3R1 MR4wHAYDVQQKEwVZDZXJ0aWZpY2F0ZSBBDXRob3JpdHkxDTALBgNVBAAsTBESvbmWC AQAwDQYJKoZIhvcNAQEFBQADgYEAkREAh8cbYHDvgyeXajUemuA6G0yg13BpVjN QvBQnypv0DCvoSK10kB/lcqeHoyxsUJKQMeUf7H3jbbqWp4ot7n3/ha8vA+IA 21gOmEqKbFpE5v2RzKZ39fCj/3P3QY5/jRmx5TaSt3C57ANziTWBqhNackvu8Ky 6MBDSiM= -----END CERTIFICATE----- </pre> | <a href="#">Delete</a> |

The purpose of the Add Trusted certificate web page is to provide an interface to add to the current list of Remote Server Certificates that are trusted. From the “Security” submenu, then the “Certificates” submenu, click the “Add Remote Trusted Certificate” option (see Figure 8 “Add Remote Trusted Certificate web page” on page 952). When attempting to add a certificate to the list of trusted certificates, the name of the certificate must be unique, and the “-----BEGIN CERTIFICATE-----” and “-----END CERTIFICATE-----” lines must follow the example below. Instead of the word “CERTIFICATE”, the word “TRUSTED” could be used as well. Note that only PEM formatted (i.e. base64 encoded) certificates are acceptable.



**Figure 8 Add Remote Trusted Certificate web page**

**Add Trusted Certificate**

**Certificate Name**

**Certificate (in PEM)**

```

-----BEGIN CERTIFICATE-----
MIIDMTCCApqgAwIBAgIBATANBgkqhkiG9w0BAQUFADBhMQswCQYDVQQGEWJDQTEQ
MA4GA1UECBMT250YXJpbzERMA8GA1UEBxMIVGltYnVrdHUXHjAcBgNVBAoTFUN1
cnRpZmljYXR1IEF1dGhvcml0eTENMA8GA1UECzMETm9uZTAeFw0wNDEwMDIxNjMw
MjdaFw0wNTEwMDIxNjMwMjdaMHAcCzAJBgNVBAYTAkNBMR4wDgYDVQQLIEwdPbnRh
cm1vMQ8wDQYDVQQHEwZPdHRhd2ExGDAWBgNVBAoTD05vcnRlbnCB0ZXR3b3JrczEN
MA8GA1UECzMETkdTUzEVMBMGA1UEAxMMMTcyLjE2LjYxLjcyMIGfMAOGCSqGSIb3
DQEBAAQAA4GNADCBiQKBggQCoa96x0OKcAaGkqSyYb3oJRfNdBc/sLi84QSBvY+Nq
/gLscsBOeN8iVhY2n998XWbhXzTG3TXL+qayZyHBZIO6opTOFh00ny2W++nxW8lx
B2UmXuYDX1+ktRZQJcEZjucF56iH5cNiJlJQv9D0376/nx86ccIE1SFXBZInY61
iwIDAQABo4HpMIHmMAKGA1UdEwQCMAAwLAYJYIZIAAYb4QENB8W8WU9wZW5TU0wg
R2VuZXJhdGVkIENlcnRpZmljYXRlMBOGA1UdDgQWBBTWtXiqgr7d4UoLMXX5Eqw5
oo3kSjCBiwyDVROjBtGDMIGAgBTL1FJssNnQD4Er0j//pQZ20wiVnaFlpGMwYTEL
MAKGA1UEBhMCQOEwEDA0BgNVBAGTB09udGFyaW8xETAPBgNVBACTCFRpbWJ1a3R1
MR4wHAYDVQQKEwVdZXJOaWZpY2FOZSBBDXR0b3JpdHkxDTALBgNVBAStBE5vbmWC
AQAwDQYJKoZIhvcNAQEFBQADgYEAkREAh8cbYHDvgyeXajUemuA6G0ygl3BpVjN
QvBQqnyvpODCvoSK10kB/lcqeHoyxsUJKQMeUf7H3jbbqyTwp4ot7n3/hA8vA+IA
2IgOmEQuKbFpE5v2RzKZ39fCj/RP3QY5/jRmx5TaSt3C57ANziTWBqhNackvu8Ky
6MBDSiM=
-----END CERTIFICATE-----

```

The following figures demonstrate how to provision and/or modify a server so that it utilizes the TLS protocol rather than TCP or UDP.

Figure 9 "Adding a SIP Server using the TLS protocol." on page 953 demonstrates how to add a SIP server using TLS protocol. The difference between this method and the new method is small: the user simply selects "TLS" in the protocol field beside the IP address in question to enable the use of TLS. Then complete and submit the datafill as required.

Figure 10 "Modifying a SIP server to use TLS protocol." on page 954 demonstrates how to modify a SIP server to use the TLS protocol. The user chooses to modify the SIP server as is done normally. Using the drop-down menu of the protocol field next to the IP address in question, select "TLS". Then complete and submit the datafill changes as required.

**Figure 9 Adding a SIP Server using the TLS protocol.**

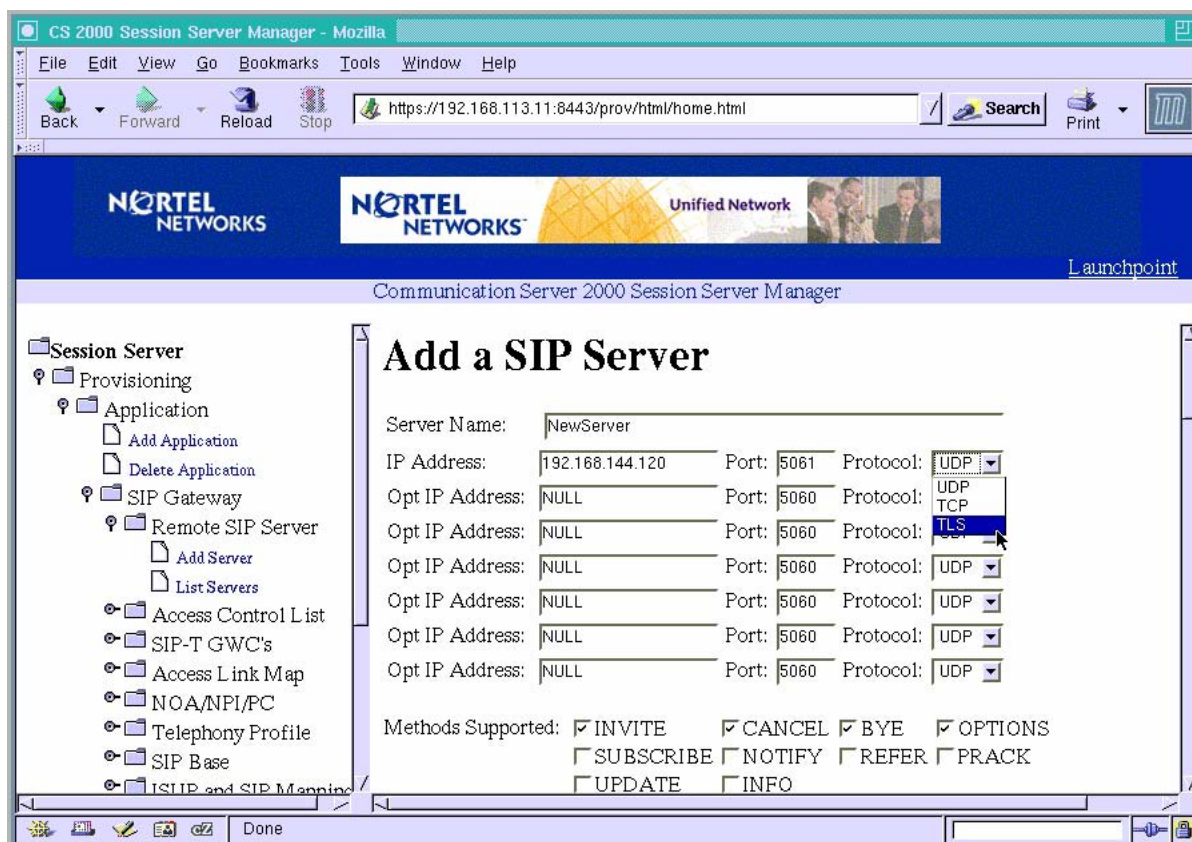
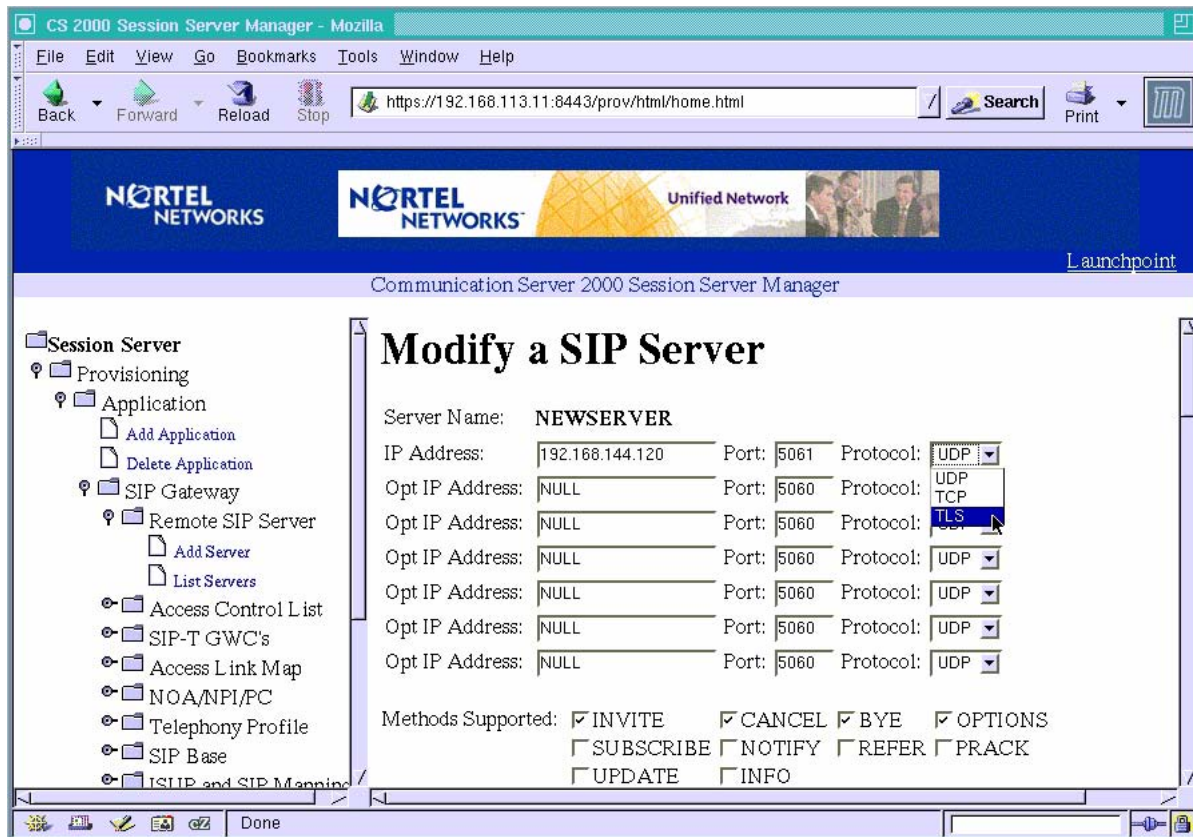


**Figure 10** Modifying a SIP server to use TLS protocol.

### 3.8.2.1.3 GUI Fields

The following table lists fields for the NGSS Tomcat Webserver Security Params GUI.

**Table 13** Security Parameters in Tomcat WebServer

| Parameter   | <b>maxTlsSessions</b>                       | Type          | Integer |
|-------------|---------------------------------------------|---------------|---------|
| Description | The Maximum number of TLS sessions allowed. | Default Value | 256     |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |            |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------|
| Effect of Change           | Changes the maximum number of TLS sessions allowed.<br>Important: NGSS callp must be locked/suspended and unsus-pended/unlocked to activate changes made on the web page.<br>Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value.                                                                                                                                                                                                                                                                                                                                          | Minimum=<br>Maximum= | 10<br>2048 |
| Adverse Effects            | Setting the value lower than the number of clients trying to connect will freeze some clients out. In SN08, the clients are peer servers to the NGSS, so this means remote servers will be denied a secure connection to the NGSS.                                                                                                                                                                                                                                                                                                                                                                                                    |                      |            |
| Countering Adverse Effects | Set the value of the parameter as high as the maximum number of peer servers connected to this NGSS.<br>The network should be engineered so that fewer than 2048 peer servers need to connect to a single NGSS at once.                                                                                                                                                                                                                                                                                                                                                                                                               |                      |            |
| Parameter                  | <b>SessionCacheEnabled</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Type                 | Y/N        |
| Description                | Determines whether session caching is enabled or not.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Default Value        | Y          |
| Effect of Change           | Enabling the session cache speeds up the performance of TLS connection requests for enabled clients. Note that, if few or no peer servers to the NGSS have session-caching enabled clients, then little or no performance increase will be observed for TLS connection requests. (Note that peer servers to the NGSS are considered clients when they initiate a connection request.)<br><b>Important:</b> NGSS callp must be locked/suspended and unsus-pended/unlocked to activate changes made on the web page.<br>Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value. |                      |            |
| Adverse Effects            | Activating session caching will allocate memory for the session cache. See the <b>SessionCacheSize</b> parm for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |            |
| Countering Adverse Effects | See the <b>SessionCacheSize</b> parm for details.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                      |            |
| Parameter                  | <b>SessionCacheSize</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Type                 | Integer    |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                    |                |               |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| Description                | The size of the TLS session cache. The session cache increases system performance by allowing clients that support session caching to bypass the time-consuming TLS handshake procedure after one handshake is done.                                                                                                                                                                                                               | Default Value  | 10            |
| Effect of Change           | A larger session cache speeds up the performance of TLS connection requests for enabled clients.<br><b>Important:</b> NGSS callp must be locked/suspended and unsuspended/unlocked to activate changes made on the web page. Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value.                                                                                       | Allowed Values | 10, 100, 1000 |
| Adverse Effects            | The largest session cache setting (1000) consumes 1 MB of memory on the NGSS.                                                                                                                                                                                                                                                                                                                                                      |                |               |
| Countering Adverse Effects | In the event that 1MB of memory cannot be devoted to the session cache, memory can be reclaimed by reducing the size of the cache. This will reduce system performance if a relatively large number of clients were session-caching enabled. Remember to lock/suspend NGSS callp to enable the change.                                                                                                                             |                |               |
| Parameter                  | SessionCacheValidDuration                                                                                                                                                                                                                                                                                                                                                                                                          | Type           | Time          |
| Description                | The duration for which sessions are stored in the session cache. The session data is expunged from the cache either 24 hours or 7 days from when it was first inserted into the cache.<br><b>Important:</b> NGSS callp must be locked/suspended and unsuspended/unlocked to activate changes made on the web page. Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value. | Default Value  | 7_Days        |



|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                |                     |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------|
| Effect of Change           | Every connecting client will be forced to do a full handshake on the first connection after its session is expunged from the cache. Changing this value changes the frequency with which this may happen. (Clients that typically stay connected for longer than 7 days will notice no difference.)<br><b>Important:</b> NGSS callp must be locked/suspended and unsuspended/unlocked to activate changes made on the web page. Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value. | Allowed Values | 24_Hours;<br>7_Days |
| Adverse Effects            | Systems that have large numbers of clients making frequent connection requests may notice performance issues on the 24_Hours setting. In SN08, this should be rare.                                                                                                                                                                                                                                                                                                                                                                             |                |                     |
| Countering Adverse Effects | Increase the value of the SessionCacheValidDuration parameter to 7_Days, and lock/suspend NGSS callp to enable the change.                                                                                                                                                                                                                                                                                                                                                                                                                      |                |                     |
| Parameter                  | localTLSPort                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Type           | Integer             |
| Description                | The port number TLS uses on the local NGSS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Default Value  | 5061                |
| Effect of Change           | Changes the port that TLS uses.<br><b>Important:</b> NGSS callp must be locked/suspended and unsuspended/unlocked to activate changes made on the web page. Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value.                                                                                                                                                                                                                                                                     |                |                     |
| Adverse Effects            | Remote clients or remote peer servers may require intervention to connect properly to TLS working under a changed port number.                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                     |
| Countering Adverse Effects | Don't change the TLS port number unless absolutely necessary. 5061 is the default port number specified in the TLS standard (RFC 2246); we recommend that the TLS standard be followed.                                                                                                                                                                                                                                                                                                                                                         |                |                     |
| Parameter                  | TlsAllowedCipherSuites                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Type           | Checklist           |

|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                |                           |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------------------|
| Description                | The cipher suites that TLS is allowed to use in secure communication.                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Default Value  | AES128-SHA                |
| Effect of Change           | Changes the set of ciphers that TLS is allowed to use. In SN08, only two ciphers are allowed; of those, AES128-SHA is mandatory. The NGSS will always accept TLS connections requested with the AES128-SHA cipher (providing, of course, that TLS is enabled in the first place).<br><b>Important:</b> NGSS callp must be locked/suspended and unsuspended/unlocked to activate changes made on the web page. Until the callp lock/suspend is performed, the displayed value will be inconsistent with the operational value. | Allowed Values | AES128-SHA;<br>AES256-SHA |
| Adverse Effects            | The only other choice available is AES256-SHA. This cipher uses larger (256-bit) keys. The user may notice a performance degradation with AES256-SHA allowed when compared to the default setting (AES128-SHA only).                                                                                                                                                                                                                                                                                                          |                |                           |
| Countering Adverse Effects | If a performance degradation is attributable to allowing AES256-SHA ciphers in TLS connections, then uncheck AES256-SHA and lock/suspend NGSS callp to enable the change.                                                                                                                                                                                                                                                                                                                                                     |                |                           |

#### 3.8.2.1.4 Usage example

The following example shows sample datafill selection for the NGSS Tomcat Security Params Configuration Web Page. Please refer to the figures cited below for examples.

Example:

1. Customer enters the NGSS EM web page.
2. Customer enters the NGSS Tomcat CallP Application webpage.
3. Customer clicks on the Provisioning Tab on the Menu Frame (see "Security Parameter Configuration Page" on page 946).
4. Customer clicks on the Security Tab.
5. Customer clicks on the Security Params link, which brings up the Security Configurable Parameters page.

6. Customer clicks on the “Modify” link beside the SessionCacheValid-Duration parameter. This brings up the Modify page for that parameter (see “Sample Pull-down Menu for Parameter Provisioning” on page 947).
7. Customer chooses between one of three options on the pull-down menu.
8. Customer can press “Change” to accept their newly chosen value, or click on another link to abort the change operation.

#### **3.8.2.1.5 GUI release history update**

For the NGSS Tomcat Application Web Server GUI, the following was added in SN08 due to this feature:

- The Security Folder, under the Provisioning folder.
- The Security Params Config page, under the Security folder.
- The Individual Security Parm Change page, accessible via per-parameter links from the Security Params Config page.

Note: The parameters displayed on the pages above are derived from entries entered in to the SOLID SQL database at loadbuild time.

- The Certificates Folder, under the Security Folder.
- The Server Certificate page, accessible via the Certificates Folder.
- The Remove Trusted Certificates page, accessible via the Certificates Folder.
- The Add Remote Trusted Certificate page, accessible via the Certificates Folder.

#### **3.8.2.1.6 Context sensitive launching information**

This GUI is accessed from a series of links starting on the NGSS main web page. The normal instructions for launching the NGSS Application Web Server can be followed for the new web pages described herein.

#### **3.8.2.1.7 Supplementary information**

All of the parameters described above require a NGSS CallP Restart in order to have the value active in the CallP Application. These parameters are marked by an orange text color on the Security Parm Configuration page (see Figure 2 “Security Parameter Configuration Page” on page 946), and also by a warning on the page where the parameter value is changed (see Figure 4 “Sample Text Input for Parameter Provisioning” on page 948).

The act of removing a trusted certificate from the list of trusted certificates will not be reflected until a CallP Restart as well. However, adding to the list of trusted certificates via the “Add Remote Trusted Certificate” web page will take effect immediately (assuming the certificate presented passes the applicable checks).

### 3.8.3 CLI Interface

#### 3.8.3.1 Certificate Management Tool (`cert_mgnt` or `cert_mgmt`)

The certificate management tool is a customer-visible tool that provides a common interface for provisioning certificates for use by Apache, Tomcat, and the NGSS Sip application.

As of SN08, all three applications use the same certificate.

The certificate management tool is located in `/sbin/cert_mgnt` or `/sbin/cert_mgmt`, and is executable only by the root user. Since `/sbin` is in the path, `cert_mgnt` can be executed from anywhere.

The certificate management tool provides three functions

- Create a new self-signed certificate for the host
- Create a certificate signing request. The craftsman would manually send the signing request to the Certificate Authority (CA) where it will be signed.
- Provision a trusted certificate (CAcertificate) and a CA-signed certificate produced from the signing request.

RSA encryption with SHA-1 only is supported by the three applications.

The tool makes permissions on private key files and the certificate keystore file to be read/write by the root user.

The `server.crt` contains the local server certificate. The `trusted.crt` file contains the certificate chain (for CA-signed certificates only) for the local server certificate. Both these files are read/write by the root user and readable by other users.

Anytime the certificate management tool is run to successful completion, the host must be rebooted, or the three applications that use the certificate must be stopped/ started.

To reboot the host as a root user: at the command prompt: `reboot`

If rebooting is not appropriate, then stopping/starting each application is necessary.

To stop/start Apache: locate the executable “`apachectl`” in the directory structure and type: `apachectl stop`. Once this is successful, type `apachectl start`

To stop/start Tomcat: locate the executable “`tomcatd`” in the directory structure and type: `tomcatd stop`. Once this is successful, type `tomcatd start`.

To stop the NGSS SIP application, the application must be locked and disabled and then enabled and unlocked using the NGSS GUI.

#### **3.8.3.1.1 Certificate Management**

Upon installation of the NGSS, the customer can either furnish their own certificates or use the certificate management tool.

If the customer furnishes their own certificates, they will be required to perform their own certificate management.

#### **3.8.3.1.2 Files used by the Certificate Management Tool**

**The directory /opt/base/share/ssl is the recommended directory to store all certificates, keys, and related files. The cert\_mgnt tool performs this automatically.**

**The tool is run only on 1 host, and the files are not synced/reflected to the other mate host in SN08. Therefore, the files must be manually copied to the other mate host using a secure method such as scp after the tool runs successfully.**

server.crt - Only the local server certificate is in this file. In the self-signed certificate option, this file is created automatically by the tool. In the CA-signed option, this file will be provided by the customer, and placed in a temporary directory for import by the tool.

trusted.crt - The certificate chain leading up to the root CA certificate is placed in this file. This file is provided by the customer, and placed in a temporary directory for import by the tool.

server.key - This file contains the private key corresponding to the certificate in server.crt

certificate.keystore - This file contains an encoded version of the server.crt, trusted.crt, and server.key file. This file is created automatically by the tool and is used by Tomcat.

The directory /opt/base/share/ssl should be backed up on a regular basis using a secure method in a physically and logically secure environment. This will help prevent unauthorized access to the private keys.

There are two files (cert\_gen.txt and assign\_cert.txt) that are placed in the /opt/base/share/ssl directory. These files are used by the tool and should not be removed.

#### **3.8.3.1.3 Certificate and Key revocation**

Not applicable.

#### 3.8.3.1.4 Self Signed Certificates

In this case, the craftsperson has chosen to use self-signed certificates.

- 1 In the case of self-signed certificates, the craftsperson selects option 1 in Figure 11 "Choose a Certificate Type" on page 964.
- 2 In order to proceed, the craftsperson must accept the disclaimer and the notice as indicated in:
  - Figure 12 "Disclaimer for Self-Signed Certificates (1 of 4)" on page 965,
  - Figure 13 "Disclaimer for Self-Signed Certificates (2 of 4)" on page 965,
  - Figure 14 "Disclaimer for Self-Signed Certificates (3 of 4)" on page 966, and
  - Figure 15 "Disclaimer for Self-Signed Certificates (4 of 4)" on page 967.

A customer log is generated logging the user's acceptance of the disclaimer.
- 3 Going back at any time will display the previous panel. Selecting proceed will only work if the craftsperson has entered the required information.
- 4 The craftsperson selects an RSA key size in Figure 13 "Disclaimer for Self-Signed Certificates (2 of 4)" on page 965. The key size can be 1024/1536/2048 bits. The higher the key size, the stronger the private key. There may be a performance impact to using higher key sizes due to additional encryption requirements.
  - If the key already exists in the /opt/base/share/ssl/ directory, the tool will prompt to reuse it or delete it and recreate a new key.
  - If the craftsperson wishes to reuse the key, the tool will always accept the key's current size. This is illustrated in Figure 17 "Key Already Exists" on page 969
  - If in Figure 17 "Key Already Exists" on page 969, the craftsperson select 'n' that they do not want to proceed, then the tool prompts for key deletion in Figure 18 "Remove Existing Key" on page 969.
  - If in Figure 17 "Key Already Exists" on page 969, the craftsperson select 'y' that they do want to proceed, then the tool will reuse the existing key and move on to step 5.

- If in Figure 18 "Remove Existing Key" on page 969, the craftsperson selects 'n' that they do want to proceed, the tool will then abort the current operation and return to the top of this step.
  - If in Figure 18 "Remove Existing Key" on page 969, the craftsperson selects 'y' that they do want to proceed, the tool will then make a backup of the existing key to another file in the same directory. A customer log is generated for this case.
- 5 The user must also select a length of time for which the certificate is valid. This is specified in Figure 19 "Expiry Days" on page 970. This is the number of days from the current date for which the certificate is valid.
  - 6 The craftsperson selects a country, state, and city name in Figure 20 "Country Name" on page 971, Figure 21 "State Name" on page 972, Figure 22 "Locality Name" on page 973. These fields are optional. Although they are optional, they help to identify the NGSS to a remote entity.
  - 7 The craftsperson selects an organizational name, and an organizational unit name in Figure 23 "Organizational Name" on page 974, and Figure 24 "Organizational Unit Name" on page 975. These fields optional. Although they are optional, they help to identify the NGSS to a remote entity.
  - 8 In Figure 25 "Common Name" on page 976, the craftsperson identifies the mandatory common name. In the case of the NGSS, this must be the IP address of the active NGSS host. This is used for mutual authentication and is necessary for the correct operation of the NGSS. There is no validation at this stage of the common name.
  - 9 In Figure 26 "Email Address" on page 977, the craftsperson identifies the optional email address of the local contact. There is no validation of the email address.
  - 10 Once all the information is entered, the tool displays a summary in Figure 27 "Summary for Self Signed Certificates" on page 978. Selecting "proceed" will generate the self signed certificate. The following message will be displayed on success:

```
Exporting certificate/key pair to PKCS#12 keystore
Certificate/key pair has been successfully exported to PKCS#12
format
Changing permissions on key file
Changing permissions on keystore file
```

If this message is displayed, the tool was successful at creating the self-signed certificate.

**Figure 11 Choose a Certificate Type**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages |
| X509 Certificate Setup
CertType | -----
|
| Welcome to the X509 Certificate Setup tool.
|
| 1) Generate Self-Signed Certificate
|
| 2) Generate Certificate Signing Request
|
| 3) Validate Certificate Chain
|
|
| Option:
| [1]
| -----
| | Abort | | Next>>|
| -----
|
| This tool will help you to bring your SSL/TLS-based applicat
| into service
| Use the <TAB> key to move and select fields
```



**Figure 12 Disclaimer for Self-Signed Certificates (1 of 4)**

|                                                                             |                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved |                                                                                                                                                                                                                                                                                                   |
| Stages                                                                      | X509 Certificate Setup                                                                                                                                                                                                                                                                            |
| CertType                                                                    |                                                                                                                                                                                                                                                                                                   |
|                                                                             | PLEASE REVIEW THE FOLLOWING TERMS AND CONDITIONS<br>REQUIRED FOR THE USE OF DIGITAL SELF-SIGNED<br>CERTIFICATES. MOVE BETWEEN PAGES BY USING THE 'C'<br>AND 'B' KEYS. IF YOU DO NOT ACCEPT THE TERMS AND<br>CONDITIONS BELOW, YOU ARE NOT AUTHORIZED TO USE A<br>DIGITAL SELF-SIGNED CERTIFICATE. |
|                                                                             | BY PRESSING 'Y' BELOW, YOU AGREE TO BE BOUND BY THE<br>TERMS AND CONDITIONS BELOW                                                                                                                                                                                                                 |
|                                                                             | Type (c) to continue                                                                                                                                                                                                                                                                              |

**Figure 13 Disclaimer for Self-Signed Certificates (2 of 4)**

### Figure 14 Disclaimer for Self-Signed Certificates (3 of 4)

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages |
       | X509 Certificate Setup
CertType -----
        |
        |
        | LIMITATION OF LIABILITY: IN NO EVENT SHALL NORTEL OR
        | ANY OF ITS SUPPLIERS AND THEIR RESPECTIVE, EMPLOYEES,
        | OFFICERS, DIRECTORS AND AGENTS BE LIABLE FOR ANY
        | DIRECT, INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY,
        | RELIANCE, OR CONSEQUENTIAL DAMAGES OF ANY KIND,
        | INCLUDING WITHOUT LIMITATION, DAMAGES FOR LOSS OF
        | BUSINESS OR BUSINESS OPPORTUNITIES, LOSS OF GOODWILL,
        | PROFITS OR DATA, BUSINESS INTERRUPTION, LOST SAVINGS
        | OR OTHER SIMILAR PECUNIARY LOSS, ARISING FROM OR IN
        | CONNECTION WITH THE USE, PERFORMANCE OR
        | NON-PERFORMANCE OF THE DIGITAL SELF-SIGNED
        | CERTIFICATE, WHETHER ARISING IN LAW OR EQUITY, ...
        |
        | Type (c) to continue, or (b) to go back
```

**Figure 15 Disclaimer for Self-Signed Certificates (4 of 4)**

|                                                                             |                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved |                                                                                                                                                                                                                                                                                                    |
| Stages                                                                      | X509 Certificate Setup                                                                                                                                                                                                                                                                             |
| CertType                                                                    |                                                                                                                                                                                                                                                                                                    |
|                                                                             | (LIMITATION OF LIABILITY CON'T): ... ARISING FROM<br>CONTRACT (INCLUDING FUNDAMENTAL BREACH), TORT<br>(INCLUDING NEGLIGENCE) OR ANY OTHER THEORY OF<br>LIABILITY AND REGARDLESS OF WHETHER NORTEL OR ITS<br>SUPPLIERS WERE AWARE OF THE POSSIBILITY THEREOF.                                       |
|                                                                             | BY ENTERING 'Y', YOU AGREE TO BE BOUND BY THE TERMS<br>AND CONDITIONS JUST REVIEWED. IF YOU DO NOT AGREE TO<br>THE TERMS AND CONDITIONS JUST REVIEWED, ENTER 'N'<br>BELOW. IF YOU DO NOT ACCEPT THESE TERMS AND<br>CONDITIONS, YOU ARE NOT AUTHORIZED TO USE A DIGITAL<br>SELF-SIGNED CERTIFICATE. |
|                                                                             | Please type yes (y) or no (n), or (b) to go back                                                                                                                                                                                                                                                   |

**Figure 16 Select Key Size**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Pages |
CertType | Configure RSA modulus size
-----
RSAModulus |
ExpiryDays | Please enter a RSA modulus size
CountryName | [1024]
State |
LocalityName |
OrgName |
OrgUnit |
CommonName |
EmailAddress |
Summary |
-----
| <<Back | | Next>> |
-----
| The RSA modulus size must be either 1024, 1536 or 2048 bits.
| Use '<' and '>' keys to move if left and right arrows don't wo
```

**Figure 17 Key Already Exists**

```

X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages      |
            | Configure RSA modulus size
-----
CertType    |
RSAModulus  |
ExpiryDays  |
CountryName |
State       | ----- Warning -----
LocalityName|
OrgName     | RSA Private key already exists.
OrgUnit     | Current Private key modulus is 1024.
CommonName  | The current RSA private key will be reused
EmailAddress| in the generation process
Summary     |
            | ----- Warning -----
            | Are you sure you want to reuse the current Private Key?
            |
            | Type yes (y) to reuse.
            | Type no (n) to generate a new RSA Private Key.

```

**Figure 18 Remove Existing Key**

```

X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages      |
            | Configure RSA modulus size
-----
CertType    |
RSAModulus  |
ExpiryDays  |
CountryName |
State       | ----- Warning! -----
LocalityName|
OrgName     | RSA Private key is about to be deleted.
OrgUnit     |
CommonName  | ----- Warning! -----
EmailAddress|
Summary     | Are you sure you want to proceed?
            |
            | Please type yes (y) or no (n)

```

**Figure 19 Expiry Days**

```
509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Pages
CertificateType
SAModulus
-----
Please enter a expiry days value
[7300]
CountryName
LocalityName
OrgName
OrgUnit
CommonName
EmailAddress
Summary

-----
| <<Back |                               | Next>>| |
-----

The value must be between 30 days and 7300 days.
Use '<' and '>' keys to move if left and right arrows don't work
```

**Figure 20 Country Name**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
ages
|
| Configure the country name
|-----
ertType
SAModulus
xpiryDays
countryName Please enter a country name (2 letter code) (optional)
|         [US]
|
|
| localityName
| rgName
| rgUnit
| ommonName
| mailAddress
| ummary
|
|
|-----
| <<Back |
|-----
| Next>> |
|-----
Use '<' and '>' keys to move if left and right arrows don't wo
```





**Figure 22 Locality Name**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
ages          |
|             | Configure the locality name
|             | -----
| certType    |
| SModulus    |
| expiryDays  | Please enter a locality name, e.g. city (optional)
| countryName |
| state       | [City]
| localityName|
| orgName     |
| orgUnit     |
| commonName  |
| mailAddress |
| summary     |
|             |
|             | -----
|             | | <<Back |
|             | | Next>> |
|             | -----
| Use '<' and '>' keys to move if left and right arrows don't wo
```

**Figure 23 Organizational Name**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
ages
|
| Configure the organizational name
|-----
ertType
SAModulus
xpiryDays
| Please enter a organizational name, e.g. company (optional)
countryName
| [Organization Name]
state
|
localityName
|
| rgName
| rgUnit
| ommonName
| mailAddress
| ummary
|
|-----
| <<Back |
|-----
| Next>>|
|-----
| Use '<' and '>' keys to move if left and right arrows don't wo
```

**Figure 24 Organizational Unit Name**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Pages |
CertType | Configure the organizational unit name (e.g. section)
-----
SAModulus |
ExpiryDays | Please enter a organizational unit name (optional)
CountryName |
State | []
LocalityName |
OrgName |
OrgUnit |
CommonName |
EmailAddress |
Summary |
-----
| <<Back | | Next>>|
-----
| Use '<' and '>' keys to move if left and right arrows don't wo
```



**Figure 26 Email Address**

```
X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Pages |
-----
entType | Configure an email address
-----
SAModulus |
-----
xpiryDays | Please enter an email address (optional)
countryName |
state | [ ]
localityName |
orgName |
orgUnit |
commonName |
mailAddress |
summary |
-----
| <<Back | | Next>> |
-----
| Use '<' and '>' keys to move if left and right arrows don't wo
```

**Figure 27 Summary for Self Signed Certificates**

```

X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages |
| Confirm the certificate information
-----
CertType |
RSAModulus |
ExpiryDays | Select 'Proceed' or 'Back' to make changes.
CountryName |
State | Modulus Size: 1024
LocalityName | Expiry Days: 7300
OrgName | Country Name: US
OrgUnit | State/Province: State
CommonName | Locality Name: City
EmailAddress | Org. Name: Organization Name
Summary | Org. Unit:
| Common Name: 10.66.18.72
| Email Address:
|
| -----
| | <<Back | | Proceed |
| -----
| This screen allows you to confirm that all of your
| settings are correct.

```

If the tool is successful in creating the self-signed certificate:

Server.crt will contain the local certificate

Server.key will contain the private key corresponding to the local certificate.

Trusted.crt will be an empty file if it did not already exist before the tool was run.

Certificate.keystore will contain the private key and local certificate.

Here is an example of the server. server.crt file respectively.

Certificate:

Data:

Version: 3 (0x2)

Serial Number: 0 (0x0)

Signature Algorithm: sha1WithRSAEncryption

Issuer: CN=10.66.18.72

Validity

Not Before: Nov 12 14:57:21 2004 GMT

Not After: Dec 12 14:57:21 2004 GMT

Subject: CN=10.66.18.72

Subject Public Key Info:

### Public Key Algorithm: rsaEncryption

RSA Public Key: (1024 bit)

Modulus (1024 bit):

```
00:d5:1d:03:7b:33:96:76:1b:9c:76:af:e9:11:5d:
d5:12:b7:e2:f1:12:51:5e:7a:c5:fd:fd:ab:30:e1:
97:7a:6b:2b:7f:fa:bd:8d:c7:a4:8f:70:af:0b:3c:
df:c8:1a:20:55:6b:c5:ea:8b:a2:a2:39:c4:53:34:
b5:58:78:83:66:6a:21:dc:d3:e9:98:c4:87:2a:14:
f8:e6:07:c1:b5:88:41:d0:d2:03:be:7d:fa:a5:fb:
9b:27:1b:55:ee:e0:21:5a:19:94:3a:74:99:06:d8:
23:4b:eb:e0:0c:eb:0b:75:13:28:79:9a:bd:35:3a:
2d:42:7e:6f:d2:fb:c6:6e:53
```

Exponent: 65537 (0x10001)

X509v3 extensions:

X509v3 Subject Key Identifier:

17:74:B1:A6:A9:BD:25:55:82:AB:53:E7:13:BF:51:E0:3B:58:F6:AC

X509v3 Authority Key Identifier:

keyid:17:74:B1:A6:A9:BD:25:55:82:AB:53:E7:13:BF:51:E0:3B:58:F6:AC

DirName:/CN=10.66.18.72

serial:00

### X509v3 Basic Constraints:

CA:TRUE

### Signature Algorithm: sha1WithRSAEncryption

87:23:97:79:e8:8c:8e:ef:7e:f1:0f:59:c3:6b:13:73:eb:99:  
ab:c0:93:3b:86:77:d6:bd:d2:6f:00:e4:96:af:60:a6:35:08:  
14:83:31:5f:b9:49:c5:fa:08:b4:9e:a3:4a:04:c2:cc:6d:2f:  
17:8e:c5:d2:30:68:dd:fc:f2:a9:69:bf:16:63:20:4f:ab:5e:  
ce:08:41:90:5a:df:99:f2:ad:fd:ae:19:e0:77:23:2a:b1:62:  
11:10:1b:03:b0:da:6d:9a:70:e3:c6:89:0c:bb:08:6b:38:b0:  
b3:28:bf:89:ef:af:de:89:70:93:ae:61:bf:f6:48:82:48:3a:  
75:ce

-----BEGIN CERTIFICATE-----

MII CETCCAXqgAwIBAgIBADANBgkqhkiG9w0BAQUFADAWMRQWegYDVQQDEwsxMC42Ni4xOC43MjAeFw0wNDExMTIxNDUzMjJFaFw0wNDEyMTIxNDUzMjJFaMBYxFDASBgNVBAMTCzEwLjY2LjE4LjcyMIGfMA0GCSqGSIb3DQEBAQUAA4GNADCBiQKBgQDVBHQN7M5Z2G5x2r+kRXdUst+LxEIfeesX9/asw4Zd6ayt/+r2Nx6SPcK8LPN/IGiBVa8Xqi6KiOcRTNLVYeINmaiHc0+mYxlcqFPjmb8GiEHQ0gO+ffql+5snG1Xu4CFaGZQ6dJkG2CNL6+AM6wt1Eyh5mr01Oi1Cfm/S+8ZuUwIDAQABo28wbTADBGNVHQ4EFgQUF3Sxpqm9JVWCq1PnE79R4DtY9qwwPgYDVR0jBDcwNYAUUF3Sxpqm9JVWCq1PnE79R4DtY9qyhGqQYMBYxFDASBgNVBAMTCzEwLjY2LjE4LjcyggEAMAwGA1UdEwQFMAMB Af8wDQYJKoZIhvcNAQEFBQADgYEAhYOxeeiMju9+8Q9ZW2sTc+uZq8CTO4Z3lr3SbwDklq9gpjUIFIMxX7lJxfoltJ6jSGTCzG0vF47F0jBo3fzvqWm/FmMgT6tezghB

kFrFmfKt/a4Z4HcjKrFiERAbA7DabZpw48aJDLsIaziwsyi/ie+v3olwk65hv/ZI  
gkg6dc4=  
-----END CERTIFICATE-----

### 3.8.3.1.5 Certificate Signing Request

- 1 In the case of a certificate signing request, the craftsperson selects option 2 in Figure 11 "Choose a Certificate Type" on page 964.
- 2 Going back at any time will display the previous panel. Selecting proceed will only work if the craftsperson has entered the required information.
- 3 The craftsperson selects an RSA key size in Figure 13 "Disclaimer for Self-Signed Certificates (2 of 4)" on page 965. The key size can be 1024/1536/2048 bits. The higher the key size, the stronger the private key. There may be a performance impact to using higher key sizes due to additional encryption requirements.
  - If the key already exists in the /opt/base/share/ssl/ directory, the tool will prompt to reuse it or delete it and recreate a new key.
  - If the craftsperson wishes to reuse the key, the tool will always accept the key's current size. This is illustrated in Figure 17 "Key Already Exists" on page 969
  - If in Figure 17 "Key Already Exists" on page 969, the craftsperson select 'n' that they do not want to proceed, then the tool prompts for key deletion in Figure 18 "Remove Existing Key" on page 969.
  - If in Figure 17 "Key Already Exists" on page 969, the craftsperson select 'y' that they do want to proceed, then the tool will reuse the existing key and move on to step 4.
  - If in Figure 18 "Remove Existing Key" on page 969, the craftsperson selects 'n' that they do want to proceed, the tool will then abort the current operation and return to the top of this step 3.
- 4 The craftsperson selects a country, state, and city name in Figure 20 "Country Name" on page 971, Figure 21 "State Name" on page 972, Figure 22 "Locality Name" on page 973. These fields are optional. Although they are optional, they help to identify the NGSS to a remote entity.
- 5 The craftsperson selects an organizational name, and an organizational unit name in Figure 23 "Organizational Name" on page 974, and Figure 24 "Organizational Unit Name" on page 975. These fields optional. Although they are optional, they help to identify the NGSS to a remote entity.



- 6 In Figure 25 "Common Name" on page 976, the craftsperson identifies the mandatory common name. In the case of the NGSS, this must be the IP address of the active NGSS host. This is used for mutual authentication and is necessary for the correct operation of the NGSS. There is no validation at this stage of the common name.
- 7 In Figure 26 "Email Address" on page 977, the craftsperson identifies the optional email address of the local contact. There is no validation of the email address.
- 8 In Figure 28 "Challenge Password" on page 982, the tool queries for a challenge password. This password is used by the tool only.
- 9 Once all the information is entered, the tool displays a summary Figure 29 "Certificate Signing Request Summary" on page 982. Selecting "proceed" will generate the self signed certificate. The following message will be displayed on success.

Generating Certificate Signing Request

Creating Certificate Signing Request

Certificate Signing Request has been successfully generated

Changing permissions on key file

- 10 The certificate signing request is sent to the Certificate Authority for signing and certificate generation. Once that is done, the certificate authority's certificate and the signed certificate are used to Validate the certificate chain in option 3 of the tool.

**Figure 28 Challenge Password**

```

X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages      |
            | Configure a challenge password
-----
CertType    |
RSA modulus  |
ExpiryDays  | Please enter a challenge password for this request
CountryName |
State       | [ ]
LocalityName|
OrgName     |
OrgUnit     |
CommonName  |
EmailAddress|
Passwd      |
Summary     |

            | -----
            | | <<Back |                               | Next>> |
            | -----
            | Use '<' and '>' keys to move if left and right arrows don't work

```

**Figure 29 Certificate Signing Request Summary**

```

X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages      |
            | Confirm the certificate request information
-----
CertType    |
RSA modulus  |
ExpiryDays  | Select 'Proceed' or 'Back' to make changes.
CountryName |
State       | Modulus Size: 2048
LocalityName| Expiry Days: 365
OrgName     | Country Name: US
OrgUnit     | State/Province: State
CommonName  | Locality Name: City
EmailAddress| Org. Name: Organization
Passwd      | Org. Unit:
Summary     | Common Name: 10.66.18.72
            | Email Address:
            | Passwd:
            | -----
            | | <<Back |                               | Proceed |
            | -----
            | This screen allows you to confirm that all of your
            | settings are correct.

```

### 3.8.3.1.6 Validate Certificate Chain

In this case, the craftsperson wishes to provision the CA-signed certificate from the signing request in option 2.

The same private key that was generated in option 2 must be the same private stored in /opt/base/share/ssl at this time. The tool will verify that the certificate provided as the user certificate matches the private key file server.key in /opt/base/share/ssl.

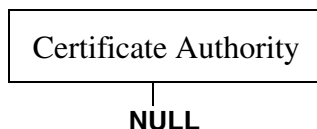
- 1 In Figure 31 "CA certificate - trusted certificate" on page 989, the craftsperson supplies the full path and filename where the CA certificates can be found. The tool will not proceed unless the file exists. The root CA certificate and the chained certificate if applicable are added to this file. There are some guidelines as to the structure of this file.
  - Root CAs that do not correspond to the local server certificate are not placed in this file. They are added to the NGSS SIP application GUI under Add Trusted Certificates.
  - Only the Root CA corresponding to the local certificate is placed in this file, followed by the CA chain. For example, if the local certificate is signed by one of the global public root CAs, then that root CA certificate is placed in this file.

Here is an example of the file which is provided. In this case, it is a chain composed of a root CA, followed by 3 (three) intermediate chain CA.

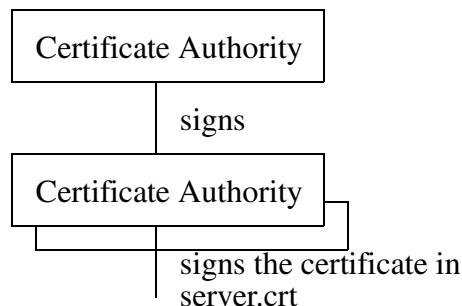
At the top of the file is certificate of the Certificate Authority (CA), followed by each intermediate chain CA, followed by that last CA which ultimately signed the local certificate.

**Figure 30 Structure of trusted.crt file**

#### Single Certificate Authority



#### Certificate Authority with intermediate CA (chain)



Certificate:  
Data:

```
Version: 3 (0x2)
Serial Number: 0 (0x0)
Signature Algorithm: md5WithRSAEncryption
Issuer: C=CA, ST=Ontario, L=Timbuktu, O=Nortel Networks, OU=Certificate Authority
Validity
    Not Before: Oct  8 01:14:48 2004 GMT
    Not After : Oct  8 01:14:48 2005 GMT
Subject: C=CA, ST=Ontario, L=Timbuktu, O=Nortel Networks, OU=Certificate Authority
Subject Public Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (1024 bit)
        Modulus (1024 bit):
            00:bc:53:2a:bd:bf:36:87:36:5b:12:93:a7:55:84:
            1d:3b:75:0f:d9:de:d6:34:d3:51:8d:96:c6:41:c6:
            80:b3:08:18:e7:b1:e5:af:0a:00:1d:65:82:77:0a:
            ca:7d:74:00:79:85:d6:80:07:79:8d:ec:b0:e3:6e:
            8c:d0:a7:20:6f:c7:3b:df:09:83:93:36:9f:eb:67:
            c1:e2:ab:a5:ed:ab:3a:d8:97:ad:83:bf:8c:11:02:
            12:3b:dc:a9:82:0d:f3:45:d7:8a:ae:96:eb:17:26:
            3c:de:7a:cd:91:71:b9:56:c7:e7:0c:7a:5e:57:62:
            9c:d7:3e:41:82:c9:f3:34:1d
        Exponent: 65537 (0x10001)
X509v3 extensions:
    X509v3 Subject Key Identifier:
        90:20:BC:77:DD:64:50:D7:50:56:5D:C7:3F:EC:7A:32:21:0F:AE:F4
    X509v3 Authority Key Identifier:
        keyid:90:20:BC:77:DD:64:50:D7:50:56:5D:C7:3F:EC:7A:32:21:0F:AE:F4
        DirName:/C=CA/ST=Ontario/L=Timbuktu/O=Nortel Networks/OU=Certificate Authority
        serial:00

    X509v3 Basic Constraints:
        CA:TRUE
Signature Algorithm: md5WithRSAEncryption
33:65:6c:d0:0d:b8:7f:58:1c:33:1c:d2:4e:e3:19:2d:36:c3:
15:7f:b3:80:cb:22:2a:dc:eb:ba:84:50:24:7c:cc:07:49:62:
f5:2c:f9:bc:47:04:56:ea:bd:78:de:44:43:22:e2:1c:5f:fc:
17:91:80:70:f3:29:e2:74:46:8d:3d:ac:fa:63:f2:b4:ba:79:
d2:22:76:6c:2e:fb:e6:55:16:6f:db:27:5f:e3:ff:32:84:5a:
b7:a3:9c:c4:73:f9:72:c2:8b:6e:8d:4f:bf:d2:3f:b1:51:48:
b5:4e:27:b4:bb:80:4b:87:f9:e7:18:ba:63:20:ac:6d:25:c2:
74:1b

-----BEGIN CERTIFICATE-----
MIIDGDCCAoGgAwIBAgIBADANBgkqhkiG9w0BAQQFADBbMQswCQYDVQQGEwJDQTEQ
MA4GA1UECBMT250YXJpbzERMA8GA1UEBxMIVGltYnVrdHUXGDAWBgNVBAoTD05v
cnRlbCB0ZXR3b3JrczEeMBwGA1UECxMVQ2VydGhmaWNhdGUgQXV0aG9yaXR5MB4X
DTA0MTAwODAxMTQ0OFOxDTA1MTAwODAxMTQ0OFOwDELMAkGA1UEBhMCQ0ExEDAO
```

```
BgNVBAGTB09udGFYaw8xETAPBgNVBACTCFRpbWJ1a3R1MRgwFgYDVQQKEw9Ob3J0
ZWwgTmV0d29ya3MxHjAcBgNVBAStFUNlcnRpZmljYXR1IEF1dGhvcml0eTCBnzAN
BgkqhkiG9w0BAQEFAAOBjQAwgYkCgYEAvmqvb82hzZbEpOnVYQd03UP2d7WNNNR
jZbGQcaAswgY57HlrwoAHWWCdwRkFXQAEYXWgAd5jeyw426M0Kcgb8c73wmDkzaf
62fB4qul7as62Jetg7+MEQISO9ypgg3zRdeKrpbrFyY83nrNkXG5VsfnDHpeV2Kc
1z5BgsnzNB0CAwEAa0ByTCBxjAdBgNVHQ4EFgQUkCC8d91kUNdQV13HP+x6MiEP
rvQwgZYGA1UdIwSBjjCBi4AUKCC8d91kUNdQV13HP+x6MiEPvShcKRuMGwxCzAJ
BgNVBAYTAkNBMRAdGyYDVQQIEWdPbnRhcmlvMREwDwYDVQQHEWhUaW1idWt0dTEY
MBYGA1UEChMPTm9ydGVsIE5ldHdvcmR4wHAYDVQQLEExVDXJ0aWZpY2F0ZSBB
dXR0b3JpdHmCAQAwDAYDVROTBABWAwEB/zANBgkqhkiG9w0BAQQFAAOBgQAZWzQ
Dbh/WBwzHNJO4xktNsMVf7OAYyIq3Ou6hFAkfMwHswL1LPm8RwRW6r143kRDIuIc
X/wXkYBw8ynidEaNPaz6Y/K0unnSInZsLvVmVRZv2ydf4/8yhFq3o5zEc/lywotu
jU+/0j+xUUi1Tie0u4BLh/nngLpjIKxtJcJ0Gw==
```

-----END CERTIFICATE-----

Certificate:

Data:

```
Version: 3 (0x2)
Serial Number: 1 (0x1)
Signature Algorithm: sha1WithRSAEncryption
Issuer: C=CA, ST=Ontario, L=Timbuktu, O=Nortel Networks, OU=Certificate Authority
Validity
    Not Before: Oct  8 01:19:20 2004 GMT
    Not After : Oct  8 01:19:20 2005 GMT
Subject: C=CA, ST=Ontario, L=Ottawa, O=Nortel Networks, OU=Chain1, CN=Chain1
Subject Public Key Info:
    Public Key Algorithm: rsaEncryption
    RSA Public Key: (1024 bit)
        Modulus (1024 bit):
            00:c5:d9:e9:4d:aa:87:56:ce:b0:ba:17:fb:fd:78:
            89:85:54:21:5b:2e:e8:71:e8:14:64:00:dd:b5:2e:
            0b:2a:e5:75:71:c2:42:17:29:e7:44:79:b0:2a:82:
            05:5b:92:c1:f3:5a:72:90:72:ee:ec:b1:77:39:cf:
            3c:c3:92:6a:6d:49:41:43:96:4c:e9:f6:3f:c3:3a:
            d9:79:11:ff:aa:74:ba:31:71:b3:0e:f0:f8:20:21:
            3c:76:5b:ad:6b:b6:27:2a:27:86:99:06:3a:1c:81:
            a5:ca:7c:68:36:cd:45:bd:2f:48:b0:5e:03:75:6e:
            35:95:42:60:3e:6e:f5:bc:35
        Exponent: 65537 (0x10001)
X509v3 extensions:
    X509v3 Basic Constraints:
        CA:TRUE
Signature Algorithm: sha1WithRSAEncryption
99:56:1b:2f:2f:b0:5f:4f:a5:7b:70:ce:6c:41:d3:36:20:2c:
31:fb:61:df:81:58:81:4c:7f:30:a8:e1:d8:c7:97:0b:ad:19:
21:19:79:ba:90:9f:3d:38:a0:66:6d:0a:6e:47:16:7f:4c:5b:
7d:5b:bd:21:23:bc:15:27:e9:e5:f5:ec:6b:38:67:69:4e:86:
82:a9:c0:f5:8a:c4:39:f7:98:89:ac:45:3f:a1:c9:47:26:9b:
54:d2:d4:9d:d2:dd:c8:4f:58:cf:7c:57:d8:10:6d:d4:3e:3e:
0a:12:1f:54:d7:f5:38:43:3d:f7:09:8e:33:b5:a1:80:00:14:
```

50:f0

-----BEGIN CERTIFICATE-----

```
MIICXjCCAcegAwIBAgIBATANBgkqhkiG9w0BAQUFADBbMQswCQYDVQGEwJDQTEQ
MA4GA1UECBMT250YXJpbzERMA8GA1UEBxMIVGltYnVrdHUxGDAWBgNVBAoTD05v
cnRlbCB0ZXNR3b3JrczEeMBwGA1UECzMVQ2VydGhmaWNhdGUgQXV0aG9yaXR5MB4X
DTA0MTAwODAxMTkyMFoXDTA1MTAwODAxMTkyMFowbDELMAkGA1UEBhMCQ0ExEDAO
BgNVBAGTB09udGFyaW8xDzANBgNVBACTBk90dGF3YTEYMBYGA1UEChMPTm9ydGVs
IE5ldHdvcmtdzMQ8wDQYDVQQLLEwZDaGFpbjExDzANBgNVBAMTBkNoYWluMTCBnzAN
BgkqhkiG9w0BAQEFAAOBjQAwgYkCgYEAxdnpTaqHV56wuhf7/XiJhVQhWy7ocegU
ZADdtS4LKuV1ccJCFynnRHmwKoIFW5LB81pykHLu7LF3Oc88w5JqbU1BQ5ZM6fY/
wzrZeRH/qnS6MXGzDvD4ICE8dluta7YnKieGmQY6HIGlynxoNs1FvS9IsF4DdW41
lUJgPm71vDUCAwEAAAMQMA4wDAYDVR0TBAAUwAwEB/zANBgkqhkiG9w0BAQUFAAOB
gQCZVhsvL7Bft6V7cm5sQdM2ICwx+2HfgViBTH8wqOHYx5cLrRkhGXm6kKJ89OKBm
bQpuRxZ/Tft9W70hI7wVJ+nl9exrOGdpToaCqcD1isQ595iJrEU/oc1HJptU0tSd
0t3IT1jPfFfYEG3UPj4KEh9U1/U4Qz33CY4ztaGAABRQ8A==
```

-----END CERTIFICATE-----

Certificate:

Data:

Version: 3 (0x2)

Serial Number: 2 (0x2)

Signature Algorithm: sha1WithRSAEncryption

Issuer: C=CA, ST=Ontario, L=Ottawa, O=Nortel Networks, OU=Chain1,  
CN=Chain1

Validity

Not Before: Oct 8 01:22:23 2004 GMT

Not After : Oct 8 01:22:23 2005 GMT

Subject: C=CA, ST=Ontario, L=Ottawa, O=Nortel Networks, OU=Chain2,  
CN=Chain2

Subject Public Key Info:

Public Key Algorithm: rsaEncryption

RSA Public Key: (1024 bit)

Modulus (1024 bit):

```
00:bf:8a:b7:44:9c:92:b5:fd:f0:e7:d3:1c:9d:65:
c4:e3:8c:cb:d3:60:a0:9d:bc:d7:87:15:d1:f0:68:
3c:71:be:2e:8d:2f:d0:7e:f6:95:2f:f3:89:b4:9b:
b6:c9:bd:52:62:8d:05:e3:71:3e:d5:c1:50:27:67:
01:f4:8b:7e:c9:6d:4e:a5:24:ff:d7:80:37:86:09:
8c:0a:8d:79:cc:b2:e6:9e:d8:7d:71:db:12:e6:84:
7e:2f:90:17:ca:84:87:9b:63:72:4a:28:d7:75:91:
f1:4f:c2:6b:5e:a7:d2:2b:01:60:f7:5f:35:dd:8e:
92:d7:b7:f5:a4:66:f6:af:21
```

Exponent: 65537 (0x10001)

X509v3 extensions:

X509v3 Basic Constraints:

CA:TRUE

Signature Algorithm: sha1WithRSAEncryption

```
3c:0c:fa:58:1f:14:d3:3f:f1:cb:80:7b:8f:bb:f7:17:e5:18:
21:bd:a2:77:3e:ce:5d:4c:80:a8:3e:7e:a1:9c:fe:c8:6a:d0:
7d:67:45:b9:5a:a6:89:3a:2f:de:25:20:2f:ed:62:b5:06:8f:
dd:a1:85:aa:a2:a3:8d:a3:6d:4c:5e:ed:e8:35:f3:50:98:26:
```

99:38:1c:33:a3:99:0a:50:11:f8:0e:21:9d:fe:56:fb:ec:b9:  
 55:ed:83:a7:b0:a4:26:82:7f:12:3b:35:9c:03:b9:40:02:3d:  
 5c:d5:34:e2:ee:ff:91:58:9f:9d:cf:2e:91:35:9d:c8:5a:f1:  
 19:59

-----BEGIN CERTIFICATE-----

MIICXjCCAcgAwIBAgIBAJANBgkqhkiG9w0BAQUFADBbMQswCQYDVQQGEwJDQTEQ  
 MA4GA1UECBMT250YXJpbzEPMA0GA1UEBxMGT3R0YXdhMRgwFgYDVQQKEw9Ob3J0  
 ZWwgTmV0d29ya3MxZDZANBgNVBAStBkNoYWluMTEPMA0GA1UEAxMGQ2hhaW4xMB4X  
 DTA0MTAwODAxMjIyM1oXDTA1MTAwODAxMjIyM1owbDELMAkGA1UEBhMCQ0ExEDAO  
 BgNVBAGTB09udGFyaW8xZDZANBgNVBAcTBk90dGF3YTEYMBYGA1UEChMPTm9ydGVs  
 IE5ldHdvcmtdzMQ8wDQYDVQQLLEwZDaGFpbiIxZDZANBgNVBAMTBkNoYWluMjCBnzAN  
 BgkqhkiG9w0BAQEFAAOBjQAwYkCgYEA4q3RjYStf3w59McnWxE44zL02CgnbzX  
 hxXR8Gg8cb4ujS/QfvaVL/OJtJu2yb1SYo0F43E+1cFQJ2cB9It+yW1OpST/14A3  
 hgmMCo15zLLmth9cdsS5oR+L5AXyoSHm2NySijXdZHxT8JrXqfSKwFg91813Y6S  
 17f1pGb2ryECAwEAAAMQMA4wDAYDVR0TBAAUwAwEB/zANBgkqhkiG9w0BAQUFAAOB  
 gQA8DPpYHxTTP/HLgHuPu/cX5RghvaJ3Ps5dTICoPn6hnp7IatB9Z0W5WqaJOi/e  
 JSAv7WK1Bo/doYWqoqONo21MXu3oNfnQmCaZOBwzo5kKUBH4DiGd/lb77L1V7YOn  
 sKQmgn8SOzWca7lAAj1c1TTi7v+RWJ+dzy6RNZ3IWvEZWQ==

-----END CERTIFICATE-----

Certificate:

Data:

Version: 3 (0x2)

Serial Number: 3 (0x3)

Signature Algorithm: sha1WithRSAEncryption

Issuer: C=CA, ST=Ontario, L=Ottawa, O=Nortel Networks, OU=Chain2,  
 CN=Chain2

Validity

Not Before: Oct 8 01:24:40 2004 GMT

Not After : Oct 8 01:24:40 2005 GMT

Subject: C=CA, ST=Ontario, L=Ottawa, O=Nortel Networks, OU=Chain3,  
 CN=Chain3

Subject Public Key Info:

Public Key Algorithm: rsaEncryption

RSA Public Key: (1024 bit)

Modulus (1024 bit):

00:9e:10:4a:52:3a:e3:27:cc:0f:bb:70:a0:dc:66:  
 df:27:47:17:54:4c:56:1e:f1:7c:6e:71:e6:b0:f1:  
 7e:2d:a3:32:e0:c1:a4:50:5e:3a:cf:eb:09:ac:f5:  
 00:f4:25:a5:ae:59:3d:b0:e5:02:af:ec:d8:b2:e5:  
 c3:31:35:d0:d0:14:35:7d:c9:85:ef:fc:b3:c4:05:  
 0b:06:b4:b9:67:53:4d:0b:e9:c8:f1:a0:44:ac:6f:  
 27:4c:71:6f:be:31:63:12:21:4d:4b:a8:58:97:67:  
 c0:e4:1f:bb:d2:fe:4d:d6:48:3c:19:c6:fb:db:2a:  
 4e:1d:bf:f4:b4:41:23:69:c5

Exponent: 65537 (0x10001)

X509v3 extensions:

X509v3 Basic Constraints:

CA:TRUE

Signature Algorithm: sha1WithRSAEncryption

bd:1b:08:a2:9f:af:f4:3e:3e:b6:72:e4:ca:ec:89:c5:fe:e4:



```

fd:99:b9:a4:31:b9:58:64:83:df:b5:8e:d3:97:89:c3:e8:0c:
96:0b:9d:c2:cc:81:b1:cd:78:17:13:ad:28:e8:ae:4d:2b:0e:
1b:b7:96:e2:74:65:23:02:5a:b1:e6:90:89:cf:9b:3c:c1:b5:
44:6f:ac:05:0d:d7:86:cc:eb:ce:ea:36:12:5a:3b:44:ac:f9:
0e:44:f5:c0:23:ff:55:1f:ef:1d:64:04:82:f2:7b:cc:22:25:
49:e4:a5:74:8c:9a:1d:22:5c:a7:7e:04:12:90:c9:88:d6:f4:
a2:b0
-----BEGIN CERTIFICATE-----
MIICXjCCAcgAwIBAgIBAzANBgkqhkiG9w0BAQUFADBQMwswCQYDVQQGEwJDQTEQ
MA4GA1UECBMHT250YXJpbzEPMA0GA1UEBxMGT3R0YXdhMRgwFgYDVQQKEw9Ob3J0
ZWwgTmV0d29ya3MxZDZANBgNVBAsTBkNoYWluMjEPMA0GA1UEAxMGQ2hhaW4yMB4X
DTA0MTAwODAxMjQ0MFoXDTA1MTAwODAxMjQ0MFowbDELMAkGA1UEBhMCQ0ExEDAO
BgNVBAGTB09udGFyaW8xZDZANBgNVBACTBk90dGF3YTEYMBYGA1UEChMPTm9ydGVs
IE5ldHdvcmtzMzQ8wDQYDVQQLEwZDaGFpbnJxMjE5MjE5MjE5MjE5MjE5MjE5MjE5
IE5ldHdvcmtzMzQ8wDQYDVQQLEwZDaGFpbnJxMjE5MjE5MjE5MjE5MjE5MjE5MjE5
BgkqhkiG9w0BAQEFAAOBjQAwgYkCgYEAhBkUjrjJ8wPu3Cg3GbFJ0cXVExWHvF8
bnHmsPF+LaMy4MGkUF46z+sJrPUA9CWlrlk9sOUCr+zYsuXDMTXQ0BQ1fcmF7/yz
xAULBrS5Z1NNC+nI8aBerG8nTHFvVjFjEiFNS6hY12fA5B+70v5N1kg8Gcb72yp0
Hb/0tEEjacUCAwEAAMQMA4wDAYDVR0TBAUwAwEB/zANBgkqhkiG9w0BAQUFAAOB
gQC9Gwiin6/0Pj62cuTK7InF/ut9mbmkMb1YZIPftY7Tl4nD6AyWC53CzIGxzXgX
E60o6K5NKw4bt5bidGUjAlqx5pCJz5s8wbVEb6wFDdeGzOvO6jYSWjtErPkORPXA
I/9VH+8dZASC8nvMIiVJ5KV0jJodIlynfgQSkMmI1vSisA==
-----END CERTIFICATE-----

```

It is recommended that this file be placed in a temporary directory such as /tmp/. When the tool validates the file, it will copy the file to /opt/base/share/ssl/trusted.crt. The file in /tmp can then be deleted once the tool completes successfully.

- 2 In Figure 32 "Server Certificate - CA signed certificate" on page 990, the craftsperson supplies the full path and filename where the signed certificate can be found. The tool will not proceed unless the file exists. Only the local server/user certificate is placed in this file.

It is recommended that this file be placed in a temporary directory such as /tmp/. When the tool validates the file, it will copy the file to /opt/base/share/ssl/server.crt. The file in /tmp can then be deleted once the tool completes successfully.

- 3 In Figure 33 "Validation Summary" on page 991, once the craftsperson has provisioned both files, then the tool validates the certificates chain and the trusted certificate files. Upon success, the tool will display the following lines:

```

Provisioning CA Certificate
Verifying certificate/key pair
server.crt: OK

```







**Figure 33 Validation Summary**

```

X509 Certificate Setup, Copyright 2004 Nortel Networks, All Rights Reserved
-----
Stages      |
             | Confirm the certificate information
-----
CertType    |
CAFile      |
CertFile    |
Summary     |
             |
             | Select 'Proceed' or 'Back' to make changes.
             |
             | CACert:  trusted.crt
             | UserCert: server.crt
             |
             |
             | -----
             | |<<Back |
             | -----
             |
             | -----
             | | Proceed |
             | -----
             |
             | This screen allows you to confirm that all of your
             | settings are correct.

```

**3.8.3.1.7 New Installation**

On a new installation, if there are no previous certificate files, then the craftsperson can initiate cert\_mgnt without issues of retaining old keys or certificates. The key file, certificate files (server.crt for the certificate file, and trusted.crt for the CA certificate), and certificate.keystore are created by default in the /opt/base/share/ssl directory and it is recommended to leave the files in that location.

The cert\_mgnt is run only on 1 unit of the NGSS, not on both. The files in /opt/base/share/ssl will have to be manually copied to the other NGSS host.

Cert\_mgnt tool is executed after the base NCGL installation and before the NGSS InstallApps script. Although technically, the cert\_mgnt tool can be run anytime, one of two actions must take place before any changes can take effect: 1) reboot machine, or 2) restart the Apache, Tomcat, and NGSS SIP application.

The craftsperson must also add the new certificate to the list of Remote Trusted Certificates on remote NGSS units.

#### **3.8.3.1.8 Upgrade using existing certificate and key files**

On an OS/application upgrade that will be using existing, the contents of /opt/base/share/ssl will have to be backed up to a safe storage (regular backups of this directory is recommended). Once the base OS upgrade is complete, then the contents of /opt/base/share/ssl are restored to the same directory. The NGSS application upgrade can then be executed. This will have to be done on both units.

When the 07 to 08 NCGL upgrade is complete, the use of certificates depends on whether the user wants to use certificates from 07.

In the case of re-using self-signed certificates, the files server.key, server.crt and certificate.keystore must be present in the /opt/base/share/ssl directory. The applications Apache, Tomcat, and Sipgwyappln should be either stopped/started, or the unit rebooted.

In the case of re-using CA signed certificates, run cert\_mgnt to re-import the server.crt and trusted.crt and to create the certificate.keystore file. This is necessary if trusted.crt, server.crt, server.key, and certificate.keystore do not already exist.

If the user wants to use new certificates after upgrading to 08, the user can run cert\_mgnt.

#### **3.8.3.1.9 Existing installation with new certificates or keys**

If the existing certificate has expired or the craftsperson wishes to use a new key, the cert\_mgnt tool will have to be executed again. The resulting files will need to be copied to the other NGSS host.

A reboot will be required for the changes to take effect.

If a remote server has a new key and or certificate, it is important for the craftsperson to remove the old certificate from the list of Remote Trusted Certificates on remote NGSS units. See section 3.8.2 "GUI information" on page 945.

The craftsperson must also add the new certificate to the list of Remote Trusted Certificates on remote NGSS units.

#### **3.8.3.1.10 Expired Certificates or Certificate Revocation**

There is no support for Certificate Revocation Lists in SN08. This is handled in the same manner as section 3.8.3.1.9 "Existing installation with new certificates or keys" on page 992.

#### **3.8.3.1.11 Copying certificate and key files to NGSS mate host**

The cert\_mgnt tool is executed only on 1 host of the NGSS, not both. The contents of /opt/base/share/ssl must be manually copied to the other NGSS

host. Please note that the key files and certificate files should be protected with proper root permissions only (this is done by the tool), and copied over using a secure copy protocol such as 'scp'.

#### **3.8.3.1.12 After provisioning a new certificate**

Once the new certificate/key pair is in place, the Apache, Tomcat, and SIPGWYAPPLN applications must be restarted to ensure they are using the new certificate. This can be handled by rebooting the unit on which the new certificate was provisioned on, or by just stopping and starting the individual applications.

### **3.9 OSSGate Interface Changes**

Not applicable.

### **3.10 Security**

The primary intent of this feature is to provide security on the signalling paths between the NGSS and its peer servers.

#### **3.10.1 Network configuration**

Network configurations should not be changed as a result of this feature.

#### **3.10.2 Key management**

Key management will be done automatically as part of certificate management procedures. Keys will thus be managed internally by the NGSS web server and/or CLI tools. No customer interface dealing with keys will be implemented.

#### **3.10.3 Protocol**

This activity is not making changes to protocols that are used to manage security.

This activity *is* introducing the use of the TLS protocol for inter-nodal CallP signalling communications between the NGSS and its peer servers and IP phone clients.

#### **3.10.4 Authentication**

This activity eliminates the need for different certificates for the Apache and Tomcat webservers. The only change that is obvious for the user is that, when using self-signed or unsigned certificates, the user will have to approve the use of only one certificate instead of two as is currently done.

### **3.11 Configuration Walkthrough**

See [“Element Management” on page 945](#).





# SN08 Feature Deltas

*Product = CS 2000*

## **A00006979--Synchronized Backup Restore Manager**

### *Functional Description*

#### **1.1 Applicable Solution(s)**

PT-IP, UA-IP, IAW

#### **1.2 Naming Conventions**

Throughout this document, the backup restore functionality delivered under this feature will be referred to in 3 distinct ways:

**Synchronous Backup Restore Manager (SBRM)** refers specifically to the IEMS launched synchronized backup/restore software. The SRBM will control/synchronize the backup related activities across other components/devices which contain related backup software.

**Device Backup Restore Manager (DBRM)** refers specifically to the component/device level backup software which is controlled by the SBRM.

**Backup Restore Manager** is a generic term encompassing both SBRM and DBRM functionalities and in general simply refers to the software which is common to both.

#### **1.3 Description**

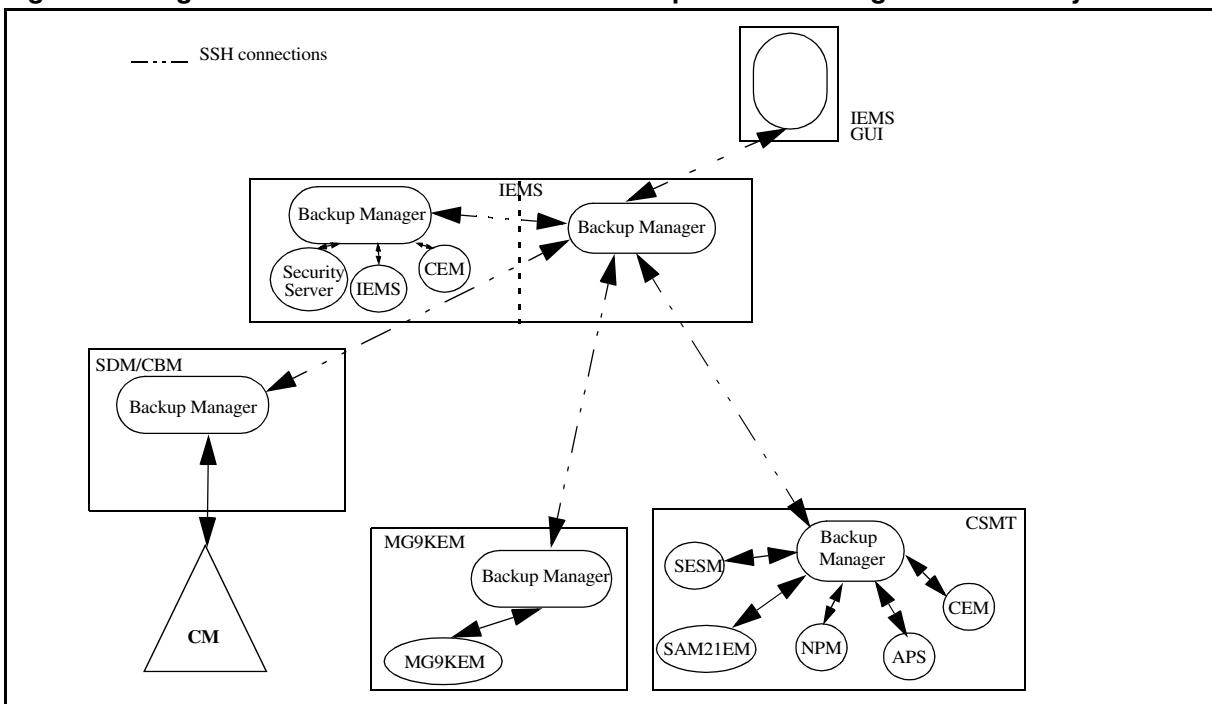
The feature provides a centralized mechanism allowing the user to initiate a synchronous backup for the core components of the Succession Call Server. Providing this capability reduces the possibility of error caused by manual backup procedures on the various component platforms spread across the Succession Call Server solution.

In SN08, the Synchronous Backup Restore Manager will provide synchronous centralized control of the backup functionality resident within the following Succession Call Server components:

- CallServer 2000 Management Tools (CSMT) server
- MG9000 Element Manager (MG9KEM) server
- Supernode Data Manager (SDM) / Core Billing Manager (CBM) server.  
The software on the SDM/CBM acts only to allow control of the XACore/3PC backup. No SDM/CBM data is backed up via the Backup Restore Manager software.
- Integrated Element Management System (IEMS) server

**Note:** The IEMS may reside with the CSMT (and other applications) on the CSMT server.

**Figure 34 High Level Functional Overview of Backup Restore Manager Functionality**



#### Functional Description:

From the IEMS GUI, the user launches the Synchronous Backup Restore Manager command line interface and initiates a backup for the core components of the Succession Call Server. The Synchronous Backup Restore Manager receives the user request, and subsequently initiates a backup command sequence (using CLI commands over SSH) to execute a synchronous backup of the components. Once the backup is complete, the backup files are stored locally on each component.



## 1.4 Hardware Requirements or Dependencies

None.

## 1.5 Software Requirements or Dependencies

All platforms requiring Synchronous Backup Restore Manager driven imaging are required to package, install and configure the Backup Restore Manager software. This software should be incorporated within the specific build process of each individual platform.

All platforms requiring Backup Restore Manager software functionality should be Java compatible and should provide a resident Java runtime system (installation).

## 1.6 Limitations and restrictions

- **Restore of generated synchronized backup images is NOT supported in the SN08 Synchronous Backup Restore Manager software. Existing manual restore procedures must be followed in order to utilize the backup images produced by the Backup Restore Manager.**
- **The Backup Restore Manager system does not perform automatic spooling of backup data/image files to secure/redundant servers. Customers are required to manage their own secure server archiving capabilities. The Backup Restore Manager system will publish data/image files in pre-determined/configurable directories on various servers:**
  - **SSPSF Platform data/image file location: /data/bkresmgr/backup**
  - **XACore/3PC data/image file location: *Configurable* - see the CN section of this feature document.**
- Backup of program store and associated patches is not covered as part of the functionality associated with Synchronous Backup Restore Manager. If a customer needs to completely 'restore' a server/component, they will need to reinstall their applications and reapply the associated patches.
- The backup “abort” command may require manual cleanup/removal of some backup files. The user will be notified at “abort” command completion time if this is the case.
- The backup process itself can not be executed while certain constructive/destructive system audits are in progress (e.g. SESM’s CS2K Data Integrity Audit). In general, if a backup is attempted while these audits are in progress, the backup attempt will be rejected. However, some constructive/destructive audits will be postponed when a backup request is received (e.g. MG9KEM Network Element Audit). The architecture of the system in question determines the appropriate behavior. In general, any

system rejections of the backup request will result in an appropriate message being displayed to the Synchronous Backup Restore Manager client user. See section “1.7 Interactions” on page 998 for a full description of system interaction limitations.

- No system wide coordination between Synchronous Backup Restore Manager and other applications (e.g. UpgradeManager, CS2K Audits, CM dump scheduling, etc.) is delivered in SN08. All application activity interdependencies must be manually managed by the user. For example, scheduled activities such as audits should be stopped during system backup. Also, any automated CM image dumps should be cancelled since the Synchronous Backup Restore Manager will be used to drive the dump within a synchronized system wide backup window.
- APS and NPM queries will be disallowed during backup. This is due to the applications being shut down during backup. Active clients will be informed of the application shutdown.
- Backup of the MG9KEM in isolation is not recommended due the CSMT platform data dependency. The MG9KEM database is hosted on the CSMT server.
- Synchronous Backup Restore Manager user authorization only controls the launch of the CLI. CLI Command specific authorization is not provided, therefore only users authorized to actually launch the Synchronous Backup Restore Manager CLI will be allowed to perform query commands at the Synchronous Backup Restore Manager CLI.
- The software on the SDM/CBM acts only to allow control of the XACore/3PC backup. No SDM/CBM data is backed up via the Backup Restore Manager software.

## 1.7 Interactions

During the period when the backup is executing, user's of the various GUI and command line provisioning interfaces will be restricted from attempting actions which result in configuration and provisioning data changes. These restrictions include, but are not limited to the following:

- Adding/deleting/updating GWCs at the Call Server Management Tools (CSMT) GUI or OSSGate interface.
- Adding/deleting/updating gateways at the CSMT GUI or OSSGate interface.
- Adding/deleting/updating line service at the at the CSMT OSSGate interface.
- Manually invoking (or running via the scheduler) the various audits at the CSMT GUI.
- Adding/deleting/updating objects in the Integrated Element Management Server (IEMS) topology via the IEMS client.

- Adding/modifying collection jobs via the IEMS client.
- Using the Runtime Administration interface at the IEMS client to perform OSS configuration.
- Using the Security Administration interface at the IEMS client to add/delete Users/Groups/Operations.
- Using the Security Administration interface at the IEMS client to change a user password.
- Adding/deleting/updating Trunks/Carriers via the CSMT
- Node provisioning/deprovisioning via the SAM21EM
- ATM connection set provisioning/deprovisioning via the SAM21EM

## 1.8 Glossary

| Term   | Definition                                |
|--------|-------------------------------------------|
| CSMT   | Call Server Management Tools              |
| MG9KEM | Media Gateway 9000 Element Manager        |
| SDM    | Supernode Data Manager                    |
| CBM    | Core Billing Manager                      |
| IEMS   | Integrated Element Management System      |
| SESM   | Succession Element and Subelement Manager |
| OSS    | Operations Support System                 |

## *Fault Management for A00006979*

### 2.1 Fault management strategy

Synchronized Backup Manager will generate two customer logs:

- BKM600 if a system backup completes successfully.
- BKM601 if a system backup fails.
- Synchronized Backup Manager will generate one security log if a user without the correct permissions attempts to invoke the Backup Manager.

### 2.2 Fault management tools and utilities

#### 2.2.1 Faults, Alarms and Logs

Existing SSPFS customerlog and securitylog facilities.

### 2.3 Logs

#### Log Title/Log ID: BKM600

### 2.3.1 Formats

#### 2.3.1.1 NTSTD

#### 2.3.1.2 SCC2

#### 2.3.1.3 Syslog

```
Aug 23 21:00:01 znc0s0j6.us.nortel.com BackupManager:  
_V2_~I=~H=znc0s0j6~A=BackupManager~S=0206~~ BKM600 NONE  
INFO System Backup Complete^M      System backup 040830_134700  
completed successfully.
```

#### 2.3.1.4 SNMP

#### 2.3.1.5 Integrated Element Manager GUI Fields

### 2.3.2 Explanation

Description: Generated when a system backup is completed successfully.

### 2.3.3 Field descriptions

None.

### 2.3.4 Action

None.

### 2.3.5 Associated Operational Measurements or Performance Measurements

None.

### 2.3.6 Additional information

Not applicable.

## Log Title/Log ID: BKM601

### 2.3.7 Formats

#### 2.3.7.1 NTSTD

#### 2.3.7.2 SCC2

#### 2.3.7.3 Syslog

```
Aug 23 21:00:01 znc0s0j6.us.nortel.com BackupManager:  
_V2_~I=~H=znc0s0j6~A=BackupManager~S=0206~~ BKM300 NONE
```

INFO System Backup Failure^M      System backup failed. ^M Reason:  
SESM not running.

#### 2.3.7.4 SNMP

#### 2.3.7.5 Integrated Element Manager GUI Fields

#### 2.3.8 Explanation

Description: Generated when a system backup fails.

#### 2.3.9 Field descriptions

**Table 16: Field descriptions**

| Field  | Value    | Description                  |
|--------|----------|------------------------------|
| Reason | variable | Reason system backup failed. |

#### 2.3.10 Action

Correct problem in system based on failure reason. Once failure is corrected, re-attempt backup.

#### 2.3.11 Associated Operational Measurements or Performance Measurements

None.

#### 2.3.12 Additional information

Not applicable.

## Log Title/Log ID: Backup Manager: class\_security.ver01

#### 2.3.13 Formats

##### 2.3.13.1 Securitylog

Aug 30 11:24:15 znc0s0jh Backup Manager: class\_security.ver01  
STAT=FAILED SRC.USR=fred EVNT.TYPE =Authentication

#### 2.3.14 Explanation

Description: Generated when a user attempts to invoke the Backup Manager and does not have the correct permissions.

#### 2.3.15 Field descriptions

None.

**2.3.16 Action**

None.

**2.3.17 Associated Operational Measurements or Performance Measurements**

None.

**2.3.18 Additional information**

Not applicable.

**2.4 Alarms**

None

**2.5 Related documentation*****Configuration for A00006979*****3.1 Naming Conventions**

Throughout this document, the backup restore functionality delivered under this feature will be referred to in 3 distinct ways:

**Synchronous Backup Restore Manager (SBRM)** refers specifically to the IEMS launched synchronized backup/restore software. The SBRM will control/synchronize the backup related activities across other components/devices which contain related backup software.

**Device Backup Restore Manager (DBRM)** refers specifically to the component/device level backup software which is controlled by the SBRM.

**Backup Restore Manager** is a generic term encompassing both SBRM and DBRM functionalities and in general simply refers to the software which is common to both.

**3.2 Hardware and Software Requirements**

Backup Restore Manager functionality requires that the appropriate software is resident and configured in all platforms which require synchronized imaging. The Backup Restore Manager software itself will be included in various platform software packages such as the SSPFS and SDM. SSPFS Backup Restore Manager functionality will be used for integration of Call Server Management Tools (CSMT), the Media Gateway 9000 Element Manager (MG9KEM), the Integrated Element Manager Server (IEMS), and the Core Billing Manager (CBM). The software on the SDM/CBM acts only to allow control of the XACore/3PC backup. No SDM/CBM data is backed up via the Backup Restore Manager software.

On the SDM, ensure the Java Runtime Environment (JRE) 1.3 package is installed. This package is not installed by default on the SDM. At the sdmmtc swim, level look for the following packages and install them in given order

First apply,

*Java Runtime Environment Executables 1.3.0.0*

*Java Runtime Environment Libraries 1.3.0.0*

Now, apply the following packages,

*Java Runtime Environment Executables 1.3.0.15*

*Java Runtime Environment Libraries 1.3.0.15*

### 3.3 Initial Configuration

1. Install Backup Restore Manager as part of the various platform software package installations (e.g. CSMT, IEMS, etc.).
2. Configure the Secure Shell (SSH) users and keys on the various platforms. See “3.8.2 Configuring SSH Between the Various Backup Restore Manager servers” on page 1010. Also, ensure the bkmgrusr is created on SDM platforms See “12.8.1.1”
3. Configure the automated Synchronous Backup Restore Manager scheduler if automated system backups are required. See “Automated Synchronous Backup Restore Manager service” on page 1019.
4. Configure the specific Backup Restore Manager installations, setting the appropriate properties for the Synchronous Backup Restore Manager which resides in IEMS and the individual component level Backup Restore Managers which reside in the other platforms (e.g. CSMT, SDM, etc.).
5. Configure the CM telnet users and Logical volume information on SDM/CBM machines. See “Configuring CM access information for Backup” on page 1027.

### 3.4 Upgrade Considerations

The centralized, Synchronous Backup Restore Manager functionality at IEMS will be blocked until the time that all affected components (CSMT, SDM, CBM, MG9KEM) are upgraded to SN08 load levels.

#### 3.4.1 Dump and Restore (CM)

Not affected. Existing Dump and Restore will continue to function.

## 3.4.2 Element Management Upgrade

### 3.4.2.1 IEMS Database Table Spaces

In order to allow backup of only configuration data (as opposed to transient event and fault data) stored by IEMS, the Oracle database definitions are split into separate table spaces when IEMS is upgraded. A configuration table space and a runtime table space are created and existing tables are assigned to either space depending on the nature of the table data. Only the configuration table space is registered for backup.

### 3.4.3 Downgrade impact

None.

## 3.5 Element Management

### 3.5.1 New/modified GUIs

Table 14 New or modified GUIs

| GUI name                                  | NEW, CHANGED, or DELETED |
|-------------------------------------------|--------------------------|
| Request disallowed due to backup process. | NEW                      |

### 3.5.2 GUI information

#### 3.5.2.1 GUI name: IEMS System Backup Command Rejection Error Dialog

##### 3.5.2.1.1 Functional description

IEMS will present the user with a general error dialog when the user attempts to perform actions which are incompatible with Synchronous Backup Restore Manager activity.

##### 3.5.2.1.2 GUI usage and implications

No usage or implications for this GUI. It is simply an error response dialog.

##### 3.5.2.1.3 GUI size

Table 15 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| Backup Error         | 0                 | NA                | NA                    |

##### 3.5.2.1.4 GUI fields

The following table lists fields for GUI or pull down menu Backup Error.



**Table 16 GUI field descriptions**

| Field       | New or Changed | Subfield | Entry | Explanation and action           | Associated MIB entry |
|-------------|----------------|----------|-------|----------------------------------|----------------------|
| Text Reason | NEW            | NA       | NA    | User must accept error response. | NA                   |

**3.5.2.1.5 Usage example**

The following example shows sample datafill or menu selection for GUI Backup Error:

**3.5.2.1.6 GUI release history update**

Not applicable.

**3.5.2.1.7 Context sensitive launching information**

Not applicable.

**3.5.2.1.8 Supplementary information**

GUI Screen shot example (many other actions can be rejected with a similar error dialog):

**3.5.3 CLUI Interface**

The Synchronous Backup Restore Manager is invoked via a CLUI. The CLUI is started by IEMS. Once the user has entered the CLUI, only Synchronous Backup Restore Manager Commands are available to the user. The command prompt within the CLUI is “bkmgr>”. The following table shows the available commands and provides a brief description of each.

**Table 17 Synchronous Backup Restore Manager Supported Commands**

| Command  | Description                                        |
|----------|----------------------------------------------------|
| commands | Displays a list of commands available to the user. |

| Command         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| help [command]  | Displays help text. If the optional command name is omitted, help text for all commands will be displayed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| exit            | Exits the Synchronous Backup Restore Manager CLUI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| quit            | Exits the Synchronous Backup Restore Manager CLUI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| backup full     | <p>Performs all steps of a backup sequence.</p> <p>If a failure is encountered or an abort is issued, the backup stops at the completion of the current step in the backup sequence.</p> <p>Example: User issues the 'backup full' command. So the first thing the Synchronous Backup Restore Manager does is issue the command 'precheck' to all the Device Synchronous Backup Restore Managers on the supported nodes currently provisioned in IEMS. As the Device Backup Restore Managers are executing the precheck, the user issues the 'bkmgr abort'. AFTER the Device Backup Restore Managers are done with the prechecks it will stop the backup sequence and return all components to their initial states (e.g. startprov).</p> |
| backup auto     | <p>Performs all steps of a backup sequence.</p> <p>Note: This is a "hidden" command only to be invoked by the Synchronous Backup Restore Manager scheduler.</p> <p>If a failure is encountered or an abort is issued, the backup stops at the completion of the current step in the backup sequence and the system will be restored to it's pre-backup state.</p> <p>This does not imply a 'rollback'. It simply means if the Device Backup Restore Managers have executed the 'stopprov' command the 'startprov' command will be issued to ensure provisioning can proceed.</p>                                                                                                                                                          |
| backup abort    | Aborts a backup after completion of the current step. Returns all applications to a startprov state if required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| query status    | <p>Display the status of the backup on a high level.</p> <p>Example: Backup in progress. Backup failed, etc.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| query history   | <p>Display information about previous backups.</p> <p>Example: Last backup executed &lt;date&gt; &lt;time&gt; successful.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| query inventory | Displays the components available for backup.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| precheck        | <p>Perform basic sanity checks to ensure the system is in a state to perform a backup.</p> <p>Example: Check disk space and possibly subtending component (application) health</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| stopprov        | Stops provisioning.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| dumpdata        | Backup the critical data.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| startprov       | Start provisioning (if stopped).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| verify          | <p>Checks the validity of the backed up data.</p> <p>Example: Validate DB data.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

| Command     | Description                                                                                             |
|-------------|---------------------------------------------------------------------------------------------------------|
| activatenew | Marks the new backup data as the current backup.<br>Example: Move current backup to permanent location. |

All commands executed within the CLUI are synchronous commands. The command prompt will not be returned to the user until the requested command completes. Therefore, if the user wishes to perform an operation such as “query status” or “backup abort” while a command is executing, another CLUI instance must be started from IEMS, and the new command executed from the second CLUI instance.

Additionally, the Synchronous Backup Restore Manager allows only one backup related command to be running at a time. If a backup, or one of the commands that executes a backup step (precheck, stopprov, dumpdata, verify, startprov, activatenew), is invoked while a backup (or backup step) is in progress, the request will be rejected.

### 3.5.3.1 Execution of Backup Steps at Component Level

As the backup process, or steps of the backup process, are invoked from the CLUI, the Synchronous Backup Restore Manager distributes the commands to the various components/servers to be backed up. In rare instances, it may necessary to run various portions of the backup process on the individual components/servers themselves. This capability is provided, and is implemented as a CLUI interface as well.

This CLUI interface can be invoked by logging into the appropriate component via a Telnet session, and performing the following commands.

```
>cd /opt/nortel/bkresmgr/cbm  
>bkmgr
```

At this point, most of the commands listed in “Table 17 Synchronous Backup Restore Manager Supported Commands” on page 1005 can be used. The commands NOT available when running at this component level are as follows.

- backup full
- backup auto
- backup abort

This capability should be used only in rare circumstances, and care should be taken to keep the Synchronous Backup Restore Manager and this Device Backup Restore Manager in sync.

## 3.6 OSSGate Interface Changes

### 3.6.1 OSSGate Changes

No existing Service Order formats or logic is affected by Backup Restore Manager. However, when Backup Restore Manager is executing a synchronized backup of CSMT, non-query OSSGate commands will be rejected with an error indicating that commands are disallowed during system backup. All modes (CI, XML, TL1) of OSSGate will support the error response. The error response will be formatted as follows:

“SERVICE ORDERS NOT ALLOWED. SYSTEM BACKUP IS IN PROGRESS. COMMANDS MAY BE REATTEMPTED FOLLOWING COMPLETION OF THE SYSTEM BACKUP.”

## 3.7 Security

### 3.7.1 Key management

SSH common key authorization based on user ID is used to screen activity between the various Backup Restore Managers. A common encrypted key is defined for the bkmgrusr user ID and distributed to all Backup Restore Manager platforms for the bkmgrusr user ID (see “Configuring the bkmgrusr user ID and Password for SSH Common Key Authorization” on page 1009 and “3.8.2 Configuring SSH Between the Various Backup Restore Manager servers” on page 1010)

### 3.7.2 Authentication

SSH common key authorization based on user ID is used to screen activity between the various Backup Restore Managers. A common encrypted key is defined for the bkmgrusr user ID and distributed to all Backup Restore Manager platforms for the bkmgrusr user ID (see “Configuring the bkmgrusr user ID and Password for SSH Common Key Authorization” on page 1009 and “3.8.2 Configuring SSH Between the Various Backup Restore Manager servers” on page 1010). The SSH connections between the IEMS based Synchronous Backup Restore Manager and the various Device Backup Restore Managers in the subtending application servers (CSMT, MG9KEM, etc.) are authenticated using this common key for the bkmgrusr user ID.

The launch of the Synchronous Backup Restore Manager from the IEMS GUI is authenticated using existing user based screening. Only users permitted to perform system level configuration changes will be allowed to launch the Synchronous Backup Restore Manager CLI from IEMS. Once launched, all commands (both query and non-query) are available. No further command level authentication is provided.

## 3.8 Configuration Walkthrough

### 3.8.1 Configuring the bkmgrusr user ID and Password for SSH Common Key Authorization

Before configuring SSH between the Backup Restore Manager servers the bkmgrusr user ID and password must be configured on all Backup Restore Manager Servers.

#### 3.8.1.1 Configuring the bkmgrusr user ID and Password for SSH Common Key Authorization on SSPFS Based Platforms

On SSPFS based platforms, the bkmgrusr user ID is configured by default without a password. The bkmgrusr user ID password must be configured on all SSPFS based Backup Restore Manager servers using the Integrated EMS Central Security Server. Refer to section “Changing user password” in NN10336-611 Integrated EMS Security Administration.

Refer to section “Configuring the Integrated EMS central security server in the network” in NN10336-611 Integrated EMS Security Administration for configuring the Integrated EMS Central Security Server, and section “Configuring a central security client” in NN10336-611 Integrated EMS Security Administration for configuring an Integrated EMS Central Security client.

#### 3.8.1.2 Configuring the bkmgrusr user ID and Password for SSH Common Key Authorization on SDM Based Platforms

On the SDM AIX platform, the bkmgrusr user ID and password needs to be configured in order for the SBRM to communicate with the DBRM.

1. Login to the DBRM (AIX/SDM box) by typing

>telnet <server> and pressing the Enter key. Where the server is the IP address or hostname of the SDM-AIX server where the Synchronous Backup Restore Manager is installed.

2. When prompted, login as root by entering root and password for root.
3. After login, create the user by typing

```
mkuser bkmgrusr
```

4. Now create the groups emsmtc, emsadm, emsrw by typing

```
mkgroup emsmtc
```

```
mkgroup emsadm
```

```
mkgroup emsrw
```

5. Now, make this user **bkmgrusr** belong to primary group **maint** and secondary group **emsmtc, emsadm, emsrw**

**chuser pgrp=maint groups=emsmtc,emsadm,emsrw home=/home/bkmgrusr  
admin=true shell=/bin/ksh bkmgrusr**

6. You can now confirm that the user bkmgrusr belongs to the groups maint, emsmtc, emsadm, emsrw by typing

**groups bkmgrusr**

and it will display the groups associated with this user.

7. Set the password for this user bkmgrusr by typing

**passwd bkmgrusr**

This new user is 'locked out' i.e. disabled until the password is set.

8. Logout as root and re login back to the AIX/SDM server as bkmgrusr. It would prompt the user to change password. After changing password the user would be logged in to the server. Go to the home directory if not already there

**cd /home/bkmgrusr**

**mkdir.ssh**

**chmod 700.ssh**

### 3.8.2 Configuring SSH Between the Various Backup Restore Manager servers

1. Telnet to the IEMS server where the Synchronous Backup Restore Manager is installed by typing  
> **telnet <server>** and pressing the Enter key. Where the server is the IP address or hostname of the IEMS server where the Synchronous Backup Restore Manager is installed.
2. When prompted, enter your user ID and password.
3. Change to the root user by typing  
\$ **su - root** and pressing the Enter key.
4. When prompted, enter the root password.

5. If you are setting up SSH for the first time, or are changing the SSH keys follow the procedures outlined in “Generate SSH key and transfer to Device Backup Restore Manager server” on page 1011. If you need to transfer an existing SSH key to a new or existing DBRM follow the procedures outline in “Transfer Existing SSH key to Device Backup Restore Manager server” on page 1015.

### 3.8.2.1 Generate SSH key and transfer to Device Backup Restore Manager server

1. Run the Backup Restore Manager configuration to setup SSH between the Synchronous Backup Restore Manager and various Device Backup Restore Managers:

- a. Change directory to the Backup Restore Manager configuration location and run the Backup Restore manager configuration:

```
$ cd /opt/bkresmgr/admin/bin
```

```
$ ./configure
```

Example response:

Backup Restore Manager Configuration

1 - Backup Restore Manager SSH Setup

2 - Automated Synchronous Backup Restore  
Manager Service

X - exit

select - [X, 1-2]

- b. When prompted select 1 for Backup Restore Manager SSH Setup.

Example Response:

SSH Setup for Synchronous Backup Restore Manager

1 - Generate SSH key and transfer to Device  
Backup Restore Manager servers

2 - Transfer existing SSH key to Device Backup  
Restore Manager servers

X - exit

select - [X, 1-2]

- c. When prompted select 1 for Generate SSH key and transfer to Device Backup Restore Manager servers.

Example Response:

Generate SSH key for Synchronous Backup Restore Manager and transfer to Device Backup Restore Manager servers.

WARNING: Running this script will generate a new SSH key for the bkmgrusr.

This new SSH key must be transferred to all existing and new Device Backup Restore Manager servers.

Do you want to continue? [y/n]:

- d. When prompted, enter Y to continue.

Example response:

Generating SSH key for bkmgrusr.

Sun Microsystems Inc. SunOS 5.9 Generic  
May 2002

Generating public/private rsa key pair.

Enter file in which to save the key  
(/export/home/bkmgrusr/.ssh/id\_rsa):

- e. When prompted, press the Enter key to accept default location of key file.

Example response:

Your identification has been saved in  
/export/home/bkmgrusr/.ssh/id\_rsa.

Your public key has been saved in  
/export/home/bkmgrusr/.ssh/id\_rsa.pub.

The key fingerprint is:

33:99:17:f0:ac:2a:3a:86:a9:d9:76:65:e6:70:4b:6  
8 bkmgrusr@comp5iems

Synchronizing files IF clustered node

Transfer existing SSH key to Device Backup  
Restore Manager servers

WARNING: You must have the password for the  
bkmgrusr on the Device Backup Restore Manager  
server to transfer the SSH key.

Do you want to transfer the SSH key? [y/n]:



- f. When prompted, enter Y to transfer the SSH key.

Example response:

```
Setting up to transfer SSH key to DBRM server.
```

```
Enter hostname or IP address of DBRM server to  
transfer the SSH key to:
```

- g. When prompted, enter the DBRM server hostname or IP address.

Example response:

```
Platform type of DBRM server to transfer SSH  
key to:
```

```
1 - SSPFS
```

```
2 - SDM
```

```
Enter platform type of DBRM server to transfer  
SSH key to - [1-2]:
```

- h. When prompted, enter 1 if DBRM server is a SSPFS based server or 2 if DBRM server is a SDM based server.

Example response:

```
Sun Microsystems Inc.   SunOS 5.9           Generic  
May 2002
```

```
The authenticity of host 'comp5iems  
(47.142.128.85)' can't be established.
```

```
RSA key fingerprint is  
ff:eb:a8:87:14:d0:82:28:5c:43:70:5a:ab:af:e6:f  
d.
```

```
Are you sure you want to continue connecting  
(yes/no)?:
```

- i. When prompted, enter yes to continue connecting.

Example response:

```
Warning: Permanently added  
'comp5iems,47.142.128.85' (RSA) to the list of  
known hosts.
```

```
Password:
```

- j. When prompted, enter the password for the bkmgrusr on the DBRM server.

Example response:

```
Transfer of SSH key to comp5iems complete.
```

- k. At this point, SSH will be set up for two alternate names of the server. Responses will vary depending on whether a server name or IP address was entered in the above steps, or if the server had been set up previously. Input may be required for either, both, or neither alternate name. The following examples provide one response requiring input, and one response that does not require input.

Example response:

```
Verifying SSH setup for  
'comp5iems.us.nortel.com'
```

```
The authenticity of host  
'comp5iems.us.nortel.com (47.142.128.85)' can't  
be established.
```

```
RSA key fingerprint is  
ff:eb:a8:87:14:d0:82:28:5c:43:70:5a:ab:af:e6:f  
d.
```

```
Are you sure you want to continue connecting  
(yes/no)?:
```

When prompted, enter yes.

```
Warning: Permanently added  
'comp5iems.us.nortel.com' (RSA) to the list of  
known hosts.
```

```
Successful
```

```
Verifying SSH setup for '47.142.128.85'
```

```
Successful
```

```
Is DBRM comp5iems a High Availability (HA)  
server? [y/n]:
```

2. If DBRM server is a HA server, enter Y. Otherwise enter N and proceed to Step 3.

**Note:** You need to know the password for the root user on the NBRM server to complete the following steps.

- a. Synchronize the SSH data on the NBRM server:

Example response:

```
WARNING: On HA DBRM servers, SSH setup is not
complete unless one of the following steps is
performed.
```

- a) The HA DBRM server comp5iems is cloned.
- b) The SSH data on HA DBRM comp5iems is manually synched.

```
WARNING: Choosing this option requires
the root password for comp5iems.
```

```
Do you want to manually synchronize the SSH
data on DBRM comp5iems now [y/n]
```

- b. When prompted, enter Y to manually synchronize the SSH data:

Example response:

```
Password:
```

- c. When prompted, enter the password for the root user on the NBRM server.

Example response:

```
Synchronization of SSH data on DBRM comp5iems
complete.
```

3. Repeat Step 1 f through 2 for each DBRM server.

**Note:** The SSH key must be transferred within the server it is created on. This is due to the configuration where both a SBRM and DBRM reside on the same server and use SSH to communicate within the server.

To transfer the SSH key within the server it is created on, simply enter the name (or IP address) of the server in step 1 g.

### 3.8.2.2 Transfer Existing SSH key to Device Backup Restore Manager server

1. Run the Backup Restore Manager configuration to setup SSH between the Synchronous Backup Restore Manager and various Device Backup Restore Managers:
  - a. Change directory to the Backup Restore Manager configuration location and run the Backup Restore manager configuration:  
**\$ cd /opt/bkresmgr/admin/bin**

```
$ ./configure
```

Example response:

Backup Restore Manager Configuration

- 1 - Backup Restore Manager SSH Setup
- 2 - Automated Synchronous Backup Restore Manager Service

X - exit

select - [X, 1-2]

- b. When prompted select 1 for Backup Restore Manager SSH Setup.

Example Response:

SSH Setup for Synchronous Backup Restore Manager

- 1 - Generate SSH key and transfer to Device Backup Restore Manager servers
- 2 - Transfer existing SSH key to Device Backup Restore Manager servers

X - exit

select - [X, 1-2]

- c. When prompted select 2 for Transfer existing SSH key to Device Backup Restore Manager servers.

Example Response:

Transfer existing SSH key to Device Backup Restore Manager servers

WARNING: You must have the password for the bkmgrusr on the Device Backup Restore Manager server to transfer the SSH key.

Do you want to transfer the SSH key? [y/n]:

- d. When prompted, enter Y to transfer the SSH key.

Example response:

Setting up to transfer SSH key to DBRM server.

Enter hostname or IP address of DBRM server to transfer the SSH key to:

- e. When prompted, enter the DBRM server hostname or IP address.

Example response:

```
Platform type of DBRM server to transfer SSH
key to:
```

```
1 - SSPFS
```

```
2 - SDM
```

```
Enter platform type of DBRM server to transfer
SSH key to - [1-2]:
```

- f. When prompted, enter 1 if DBRM server is a SSPFS based server or 2 if DBRM server is a SDM based server.

Example response:

```
Sun Microsystems Inc.   SunOS 5.9           Generic
May 2002
```

```
The authenticity of host 'comp5iems
(47.142.128.85)' can't be established.
```

```
RSA key fingerprint is
ff:eb:a8:87:14:d0:82:28:5c:43:70:5a:ab:af:e6:f
d.
```

```
Are you sure you want to continue connecting
(yes/no)?:
```

- g. When prompted, enter yes to continue connecting.

Example response:

```
Warning: Permanently added
'comp5iems,47.142.128.85' (RSA) to the list of
known hosts.
```

```
Password:
```

- h. When prompted, enter the password for the bkmgrusr on the DBRM server.

Example response:

```
Transfer of SSH key to comp5iems complete.
```

- i. At this point, SSH will be set up for two alternate names of the server. Responses will vary depending on whether a server name or IP address

was entered in the above steps, or if the server had been set up previously. Input may be required for either, both, or neither alternate name. The following examples provide one response requiring input, and one response that does not require input.

Example response:

```
Verifying SSH setup for  
'comp5iems.us.nortel.com'
```

```
The authenticity of host  
'comp5iems.us.nortel.com (47.142.128.85)' can't  
be established.
```

```
RSA key fingerprint is  
ff:eb:a8:87:14:d0:82:28:5c:43:70:5a:ab:af:e6:f  
d.
```

```
Are you sure you want to continue connecting  
(yes/no)?:
```

When prompted, enter yes.

```
Warning: Permanently added  
'comp5iems.us.nortel.com' (RSA) to the list of  
known hosts.
```

```
Successful
```

```
Verifying SSH setup for '47.142.128.85'
```

```
Successful
```

```
Is DBRM comp5iems a High Availability (HA)  
server? [y/n]:
```

2. If DBRM server is a HA server, enter Y. Otherwise enter N and proceed to Step 3.

**Note:** You need to know the password for the root user on the NBRM server to complete the following steps.

- a. Synchronize the SSH data on the NBRM server:

Example response:

```
WARNING: On HA DBRM servers, SSH setup is not  
complete unless one of the following steps is  
performed.
```

- a) The HA DBRM server comp5iems is cloned.
- b) The SSH data on HA DBRM comp5iems is manually synched.

WARNING: Choosing this option requires the root password for comp5iems.

Do you want to manually synchronize the SSH data on DBRM comp5iems now [y/n]

- b. When prompted, enter Y to manually synchronize the SSH data:

Example response:

Password:

- c. When prompted, enter the password for the root user on the NBRM server.

Example response:

Synchronization of SSH data on DBRM comp5iems complete.

- 3. You will be prompted to transfer the SSH key to another DBRM server. Enter Y to transfer SSH key to another DBRM server. Enter N if you do not want to transfer SSH key to another DBRM server. If you enter N you have completed the procedure.

Example response:

WARNING: You must have the password for the bkmgrusr on the Device Backup Restore Manager server to transfer the SSH key.

Do you want to transfer the SSH key to another DBRM server? [y/n]:

- 4. Repeat Step 1 d through 3 for each DBRM server you want to transfer the SSH key to.

### 3.8.3 Automated Synchronous Backup Restore Manager service

#### 3.8.3.1 Configuring the Automated Synchronous Backup Restore Manager service

- 1. Telnet to the IEMS server where the Synchronous Backup Restore Manager is installed by typing  
> **telnet <server>** and pressing the Enter key. Where the server is the IP address or hostname of the IEMS server where the Synchronous Backup Restore Manager is installed.

2. When prompted, enter your user ID and password.
3. Change to the root user by typing  
\$ **su - root** and pressing the Enter key.
4. When prompted, enter the root password.
5. Run the Backup Restore Manager configuration. Change directory to the Backup Restore Manager configuration location and run the Backup Restore manager configuration:  
\$ **cd /opt/bkresmgr/admin/bin**

\$ **./configure**

Example response:

Backup Restore Manager Configuration

```
1 - Backup Restore Manager SSH Setup
2 - Automated Synchronous Backup Restore
  Manager Service
X - exit
select - [X, 1-2]
```

6. When prompted select 2 for Automated Synchronous Backup Restore Manager Service.

Example Response:

Automated Synchronous Backup Restore Manager Service

```
1 - Configure Automated Synchronous Backup Restore
  Manager Service
2 - Start the Automated Synchronous Backup Restore
  Manager Service
3 - Stop the Automated Synchronous Backup Restore
  Manager Service
4 - View the Automated Synchronous Backup Restore
  Manager Service Configuration
X - exit
select - [X, 1-4]
```

7. When prompted select 1 for Configure Automated Synchronous Backup Restore Manager Service.

Example Response:

Automated Synchronous Backup Restore Manager Service Configuration



Configuring the Automated Synchronous Backup Restore Manager Service does not START the service. Return to the previous menu and select 'Start the Automated Synchronous Backup Restore Manager Service' to start the service.

Day of week to run the Synchronous Backup Restore Manager:

This is day of the week the Synchronous Backup Restore Manager will execute a full backup.

- 1 - MONDAY
- 2 - TUESDAY
- 3 - WEDNESDAY
- 4 - THURSDAY
- 5 - FRIDAY
- 6 - SATURDAY
- 7 - SUNDAY

Enter day of week to run the Synchronous Backup Restore Manager (default: SUNDAY):

8. When prompted enter the number corresponding to the day of the week.

Example Response:

Hour to run the Synchronous Backup Restore Manager based on 24 hour clock:

Example 1 is 1 AM, 12 is noon, and 24 is midnight.

This is the hour on the SATURDAY the Synchronous Backup Restore print Manager will execute a full backup.

Enter hour to run the Synchronous Backup Restore Manager (default: 24)

9. When prompted enter a number corresponding to the time on the day of the week (based on a 24 hour clock).

Example Response:

Automated Synchronous Backup Restore Manager Service Configuration complete.

10. You have completed this procedure. To start the Automated Synchronous Backup Restore Manager Service refer to.

### 3.8.3.2 Starting the Automated Synchronous Backup Restore Manager service

1. Telnet to the IEMS server where the Synchronous Backup Restore Manager is installed by typing  
> **telnet <server>** and pressing the Enter key. Where the server is the IP address or hostname of the IEMS server where the Synchronous Backup Restore Manager is installed.
2. When prompted, enter your user ID and password.
3. Change to the root user by typing  
\$ **su - root** and pressing the Enter key.
4. When prompted, enter the root password.
5. Run the Backup Restore Manager configuration. Change directory to the Backup Restore Manager configuration location and run the Backup Restore manager configuration:  
\$ **cd /opt/bkresmgr/admin/bin**

\$ **./configure**

Example response:

Backup Restore Manager Configuration

```
1 - Backup Restore Manager SSH Setup
2 - Automated Synchronous Backup Restore
    Manager Service
X - exit
select - [X, 1-2]
```

6. When prompted select 2 for Automated Synchronous Backup Restore Manager Service.

Example Response:

Automated Synchronous Backup Restore Manager Service

```
1 - Configure Automated Synchronous Backup Restore
    Manager Service
2 - Start the Automated Synchronous Backup Restore
    Manager Service
3 - Stop the Automated Synchronous Backup Restore
    Manager Service
4 - View the Automated Synchronous Backup Restore
    Manager Service Configuration
X - exit
```

```
select - [X, 1-4]
```

7. When prompted select 2 for Start the Automated Synchronous Backup Restore Manager Service.

Example Response:

```
Start the Automated Synchronous Backup Restore  
Manager Service
```

```
WARNING: Running this script will start the  
Automated Synchronous Backup Restore Manager  
Service
```

```
Starting the service does not initiate a backup  
until the day and time configured.
```

```
Do you want to continue? - [y/n]:
```

8. When prompted enter Y to start the Automated Synchronous Backup Restore Manager Service.

Example Response:

```
Registering with SERVMAN.
```

```
Starting the Automated Synchronous Backup Restore  
Manager Service.
```

```
Starting AUTO_BACKUP_MANAGER through servstart  
AUTO_BACKUP_MANAGER Started
```

9. You have completed this procedure.

### 3.8.3.3 Stopping the Automated Synchronous Backup Restore Manager service

1. Telnet to the IEMS server where the Synchronous Backup Restore Manager is installed by typing  
> **telnet <server>** and pressing the Enter key. Where the server is the IP address or hostname of the IEMS server where the Synchronous Backup Restore Manager is installed.
2. When prompted, enter your user ID and password.
3. Change to the root user by typing  
\$ **su - root** and pressing the Enter key.
4. When prompted, enter the root password.

5. Run the Backup Restore Manager configuration. Change directory to the Backup Restore Manager configuration location and run the Backup Restore manager configuration:

```
$ cd /opt/bkresmgr/admin/bin
```

```
$ ./configure
```

Example response:

```
Backup Restore Manager Configuration
```

```
1 - Backup Restore Manager SSH Setup
```

```
2 - Automated Synchronous Backup Restore  
    Manager Service
```

```
X - exit
```

```
select - [X, 1-2]
```

6. When prompted select 2 for Automated Synchronous Backup Restore Manager Service.

Example Response:

```
Automated Synchronous Backup Restore Manager  
Service
```

```
1 - Configure Automated Synchronous Backup Restore  
    Manager Service
```

```
2 - Start the Automated Synchronous Backup Restore  
    Manager Service
```

```
3 - Stop the Automated Synchronous Backup Restore  
    Manager Service
```

```
4 - View the Automated Synchronous Backup Restore  
    Manager Service Configuration
```

```
X - exit
```

```
select - [X, 1-4]
```

7. When prompted select 3 for Stop the Automated Synchronous Backup Restore Manager Service.

Example Response:

```
Stop the Automated Synchronous Backup Restore  
Manager Service
```

```
WARNING: Running this script will stop the  
Automated Synchronous Backup Restore Manager  
Service
```

Stopping the service does not abort a backup in progress.

Do you want to continue? - [y/n]:

8. When prompted enter Y to stop the Automated Synchronous Backup Restore Manager Service.

Example Response:

Stopping the Automated Synchronous Backup Restore Manager Service.

Stopping group using servstop  
AUTO\_BACKUP\_MANAGER Stopped

Deregistering with SERVMAN

9. You have completed this procedure.

#### 3.8.3.4 Viewing the Automated Synchronous Backup Restore Manager service configuration

1. Telnet to the IEMS server where the Synchronous Backup Restore Manager is installed by typing  
> **telnet <server>** and pressing the Enter key. Where the server is the IP address or hostname of the IEMS server where the Synchronous Backup Restore Manager is installed.
2. When prompted, enter your user ID and password.
3. Change to the root user by typing  
\$ **su - root** and pressing the Enter key.
4. When prompted, enter the root password.
5. Run the Backup Restore Manager configuration. Change directory to the Backup Restore Manager configuration location and run the Backup Restore manager configuration:  
\$ **cd /opt/bkresmgr/admin/bin**  
\$ **./configure**

Example response:

Backup Restore Manager Configuration  
1 - Backup Restore Manager SSH Setup

```
2 - Automated Synchronous Backup Restore
    Manager Service
```

```
X - exit
```

```
select - [X, 1-2]
```

6. When prompted select 2 for Automated Synchronous Backup Restore Manager Service.

Example Response:

```
Automated Synchronous Backup Restore Manager
Service
```

```
1 - Configure Automated Synchronous Backup Restore
    Manager Service
```

```
2 - Start the Automated Synchronous Backup Restore
    Manager Service
```

```
3 - Stop the Automated Synchronous Backup Restore
    Manager Service
```

```
4 - View the Automated Synchronous Backup Restore
    Manager Service Configuration
```

```
X - exit
```

```
select - [X, 1-4]
```

7. When prompted select 4 for View the Automated Synchronous Backup Restore Manager Service Configuration.

Example Response:

```
The Automated Synchronous Backup Restore Manager
Service is running
```

```
Automated Synchronous Backup Restore Manager
Service Configuration Settings
```

```
Backup Enabled                               : Y
```

```
Backup Day                                   : SATURDAY
```

```
Backup Hour                                  : 23
```

8. You have completed this procedure.

### 3.8.4 Configuring CM access information for Backup

Before the software can automatically back up image on CM, the user needs to configure information to access CM. This section covers the necessary steps which needs to be done, before CM backup will be successful when initiated through the Synchronous Backup Restore Manager. On the SDM (AIX), as soon as the software is installed, this configuration script will be run automatically by SWIM. However on Core Billing Manager machine (Solaris), the user has to manually do the steps (1 - 6)

1. 1. telnet to Core Billing Manager machine, one of which would have been chosen in the network to interface with the CM by typing

```
#telnet <server>
```

2. When prompted, enter your user ID and password.
3. Change to the root user by typing  
\$ **su - root** and pressing the Enter key.
4. When prompted, enter the root password.
5. cd to /opt/nortel/bkresmgr/cbm/scripts directory
6. Run the configure script by typing

```
#./bkmgr_config.sh and hit the <enter> key
```

This script will prompt the following information

- a. user name: This is the user name which will be used to login to CM to initiate image dump. The script restricts you to have user name of 16 characters. First permit this user on the CM before doing this configuration. See Section 12.12.2.1 Setting user id on CM
- b. password: This is the password for the user entered above. The script restricts you to have password of 16 characters. First permit this user on CM before doing this configuration. See Section 12.12.2.1 Setting user id on CM
- c. Logical Volume: This is the device in which the image dump will be stored. User should ensure that this device has enough space for backup
- d. CM type: The type of CM, whether it is Xacore or Compact. This information is needed so the software knows whether CM will have Message Switch load also.

Shown below is screen output running this configure script.

```
# ./bkmgr_config.sh
Backup Restore Manager Configuration
```

---

Enter the CM user name: bkuser

Enter the password for bkuser:

Enter the Logical volume where backup is to be stored: sd01image

Enter the type of CM 1.XA-Core 2. Compact [1/2]: 2

Please wait while storing configuration information...

### 3.8.4.1 Setting user id on CM

#### At the CI prompt on the switch

```
> permit <backup-user> <password> 4 10000 ENGLISH ALL
```

where,

<backup-user> is the user name for user which will be used by Backup Restore Manager to login

<password> is the password for the <backup-user>

4 is the priority

10000 is the stacksize

and language is ENGLISH

privilege is ALL

The type of operations done by this user are shown below

- i. Set dump\_restore\_in\_progress field in ofcstd table
- ii. start image dump
- iii. should be able to run itocci command set
- iv. should be able to do diskut commands

**Note 1:** If Enhanced Password control is in effect on CM, the password should be atleast 6 characters long.

**Note 2:** If Enhanced Password control is in effect on CM, after the user is permitted on the switch, login to CM manually with this user first. The CM will prompt you to change the password at first login after being permitted. Change the password and then do the configuration on SDM/CBM with the



user and the changed password. Backup Restore Manager software does not have ability to manage passwords. Hence, the customer needs to ensure that when the passwords expire and change on CM for this 'backup-user', CBM/SDM configuration should be re-run to ensure the Device Backup Restore Manager has password in sync with CM.

## ***Product = CS 2000***

### **A00007024--Core Element Manager (CEM) Patching** ***Functional Description***

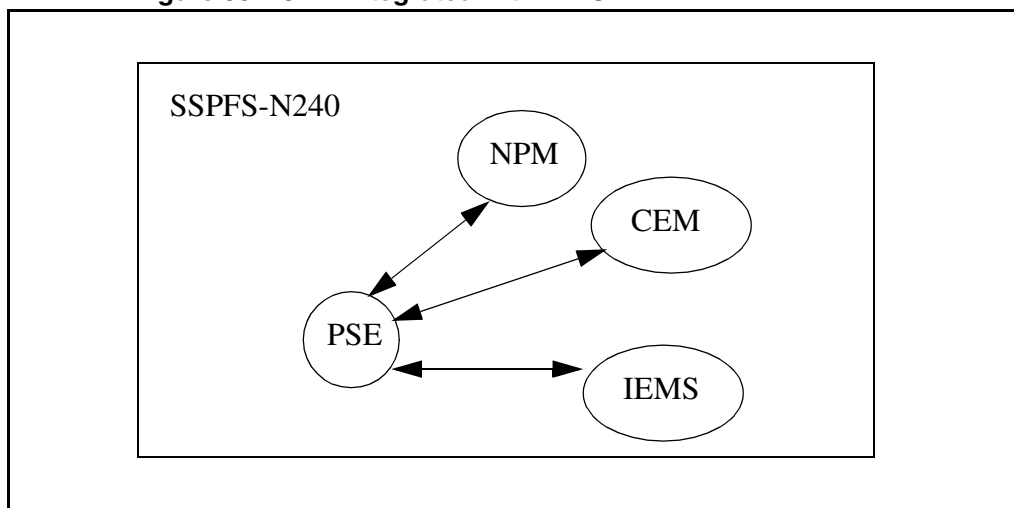
#### **1.1 Applicable Solution(s)**

PT-IP, UA-IP, IAC, PT-AAL2

#### **1.2 Description**

In SN08, the CEM will be integrated with the Integrated Element Management System (IEMS) on Solaris. IEMS is patched via the Network Patch Manager (NPM). It is required that one patch management system be used with all applications on the same node. Therefore, the CEM integrated with IEMS will also be patched by the NPM.

**Figure 35 CEM Integrated with IEMS**



##### **1.2.1 Incremental Cumulative Patching**

CEM patches are incrementally cumulative. Each patch contains the fixes that prior patches introduced, but only the fix content that has been introduced since the final compile version of the CEM load is included in each patch.

This allows a customer to apply only the latest patch if desired, since it will contain all of the fix content included in previous patches. CEM patches are delivered by RPS. There is only one Released patch at any given point in time, unless it is the first patch for the load which can be at Verified or Released status. After a patch is Released, all previous patches are set to Superseded in RPS and will no longer be delivered.

NPM is the patch management system to apply and remove CEM patches and perform maintenance patching activities on the CEM. All patching functionality available in NPM is available for CEM patching.

With this methodology of patching, if 3 patches have been released and all 3 have been downloaded to a customer site, the customer can choose to physically apply patch 1, patch 2, and patch 3, or the customer can choose to apply patch 3 only. If only patch 3 is applied, this essentially results in having patch 1, patch 2, and patch 3 applied. If only patch 3 is applied, patch 1 and patch 2 cannot be removed individually. If only patch 3 is applied, when patch 3 is removed, patch 2 and patch 1 are also removed.

## 1.2.2 Patching Maintenance

When the new NPM patchable CEM application is installed, the NPM automatically becomes aware of it. CEM appears in reports and the device list of the GUI. The following functions that exist for other targets are now available for CEM:

- apply
- remove
- audit
- restart
- set/report creation
- plans/automation
- alarms

### 1.2.2.1 CEM Patch Application and Removal

Like existing OAM Java-based applications such as SESM, SAM21EM, or IEMS components, the CEM requires 2 steps for application and 2 steps for removal of patches.

Application:

- apply command from the NPM GUI or CLUI (sets patch to applied/disabled)
- restart command from the NPM GUI or CLUI on IEMS (sets patch to applied/enabled)

Removal:

- remove command from the NPM GUI or CLUI (sets patch to removed/enabled)
- restart command from the NPM GUI or CLUI on IEMS to disable the patch (sets patch to removed/disabled)

When CEM is running in a clustered configuration, the 2 step application and removal of patches is necessary only on the active side of the SSPFS-based machine. A restart from the NPM GUI or CLUI on the inactive instance of the CEM application is not required to enable or disable patches. When a patch is applied or removed on the inactive CEM application, the patch is automatically enabled or disabled since the CEM application is not running on the inactive SSPFS-based machine.

The apply and restart operations from the NPM GUI and CLUI can be automatically scheduled via NPM plans (autoapply and autorestart).

### 1.2.3 Patchid Modification

The patchid has been modified to allow greater than 8 character patchids. The patchid format for CEM patches can have up to 32 alpha-numeric characters. The CEM patchid does not contain records that identify the target or release to which the patch is applicable. An example CEM patchid is CEM\_PATCH.17.1-20040901.

In SN08, CEM will be the only product to take advantage of the expanded patchid. The current 8 character patchid format will remain for all other products for which NPM manages patches.

### 1.2.4 Patch File Format Modifications

The patch file format is modified with this feature to implement the incremental cumulative nature of CEM patching. The following additions and changes have been made:

- A new **H** record is introduced to track included patches. This new record is stored in the ADM section of the patch file and is included only in CEM patches. Zero to many of these records can exist. The record format is:

**H INCLUDED\_PATCH <patchid>**

where patchid is the name of the patch included

- A new **V** record is introduced to track the patch file format version. This record is added to all NPM managed patches.
- The **I** record is enhanced. If a patchid is greater than 8 characters it will not fit in the normal patchid position of the I record. The placement for patchid will be filled with 8 characters of something other than the real patchid, and the E record will contain the actual patchid.

### 1.3 Hardware Requirements or Dependencies

None.

### 1.4 Software Requirements or Dependencies

The GEM18 CEM load is required to interact with NPM.

### 1.5 Limitations and restrictions

None

### 1.6 Interactions

Feature A00007304 - CEM I & C on IEMS

### 1.7 Glossary

| Term | Description             |
|------|-------------------------|
| NPM  | Network Patch Manager   |
| CEM  | Core Element Manager    |
| RPS  | Regional Patch Selector |

***Product = CS 2000***

## **A00007071--Third-party GW Interop Profiles**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAW

#### **1.2 Description**

This document describes provisioning aspects associated with the 3rd Party Gateway (GW) Interop activity which is introduced into the SN08 release. GW profiles are used as a means of defining various aspects of a GW such as the number of Endpoints (EP), Protocol, etc. These attributes and others are updated on the Call Server 2000 Management Tools (CMT) platform and distributed to the GWC and XaCore platforms.

Prior to this activity, introducing a new profile was a cumbersome task that required software updates and typically required the formal process of creating

a new “feature.” As a result, turnaround time to introduce a new profile was excessive.

Starting in SN08, many new 3rd Party GWs will be “Interop Tested” with the Nortel Succession Hardware and Software. Interop testing is a process where a vendor makes their product available (a GW in this case) and Nortel Networks personnel test to insure that the equipment integrates into the system and functions correctly.

To facilitate the rapid introduction of new profiles, this activity will make updates that allow Interop personnel to introduce a new profile by creating a file and putting it in a predefined location on the CMT platform. Creation of the file is accomplished by including a list of predefined attributes that will uniquely describe a profile. In theory, all attributes that a vendor needs to define the new profile are made available for inclusion in the profile. The file that describes the profile has been given the generic label of “Certificate” and will be referenced as such in subsequent sections of this document and other associated documents.

The diagram below depicts the major components of the 3rd Party Profiles feature and the general functionality. For specific details for creation and installation of a new Certificate refer to the accompanying documentation in the Configuration.

In order to provide these new functionalities, the customer will see changes in the following areas:

- **SESM**

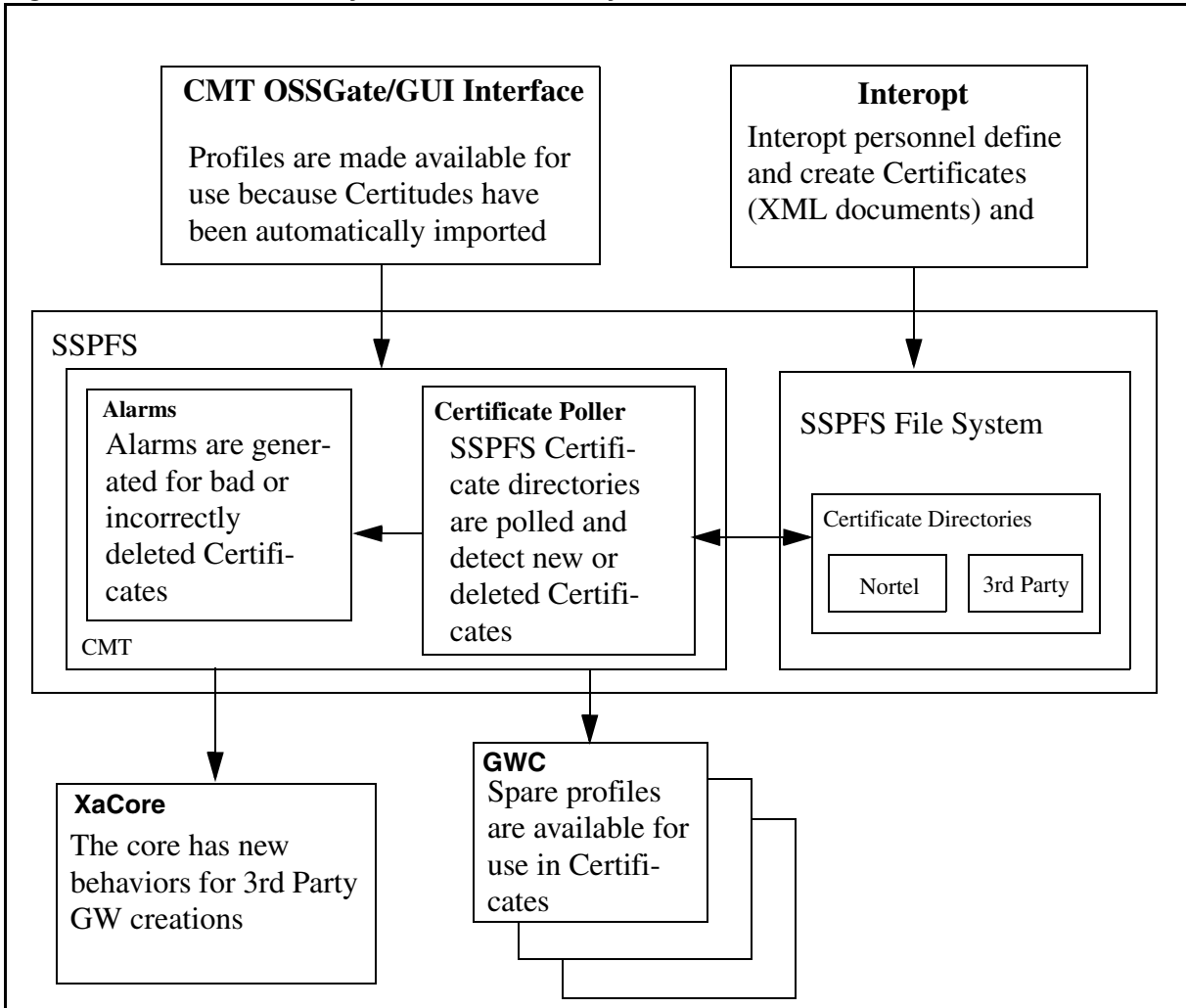
Certificates which define a profile are read into the system and made available for provisioning.

- **GWC**

Spare profiles numbers are made available and should be used for new profiles.

- **Core**

Table LGRPINV is a Core table which is (with only minor exceptions) auto-provisioned from the SESM. A new optional field is added by this feature. While this field will be visible, it will not be provisionable until a later release. For details on this optional field, refer to Data Base Schema Information which is located in the Configuration section of this design document.

**Figure 36 General 3rd Party Profile Functionality**

### 1.3 Hardware Requirements or Dependencies

There are no hardware dependencies required to execute this feature.

### 1.4 Software Requirements or Dependencies

Each of the following components must be at the specific software load for this feature to function properly:

- SESM - SN08 release
- GWC - SN08 release
- CORE - SN08 release (BCS 56) or later

## 1.4.1 Limitations and restrictions

### 1.4.1.1 CMT

- The Succession system is set up so that the upgrade of the CMT is performed prior to the upgrade of the GWC and XaCore. If an attempt is made to add a new 3rd Party Certificate prior to the upgrade of the XaCore, the request will fail. This is because a new field value for the LGRPINV table is introduced by this activity and this value is not valid until XaCore software is upgraded to SN08. In addition, if the GWCs are at a pre-SN08 version attempts to use a “spare” GWC profile number introduced in the SN08 stream will fail also.
- If a GW needs modification to a profile, only limited manipulation of the Certificate is allowed (e.g., name format changes); to accomplish some changes (like a change in protocol), a new Certificate should be added and the Change GW Profile operation should be used.
- This activity has removed the Protocol and Version field from the Associate MG OSSGate command. Therefore, existing Associate MG XML documents must be modified to remove these fields.

### 1.4.1.2 GWC

Limitation on the number of spare profiles are:

- 25 spare profiles for each existing unique GW profile of small line GW type,
- 25 spare profiles for each existing unique GW profile of large line GW type,
- 25 spare profiles for each existing unique GW profile of trunk GW type,
- 20 spare profiles for each existing unique GW profile of H.323 GW type.

The setting of flags of the spare profiles are pre-defined, so that if none of the spare profile supports the requirements of the new gateway, then it is expected that the GW will be modified to work correctly with one of the pre-defined spare profiles. In addition, the spare profiles flags could be updated via a patch.

### 1.4.1.3 CORE

Even though a new optional field GTWYKEY is visible in table LGRPINV with this feature, datafilling this value is blocked until a later release.

## 1.5 Interactions

The following are the feature interactions for the A00007071 feature:

- Features which A00007071 is dependent on:
  - none
- Feature which are dependent on A00007071:

## A00007072 - 3RD PARTY GW INTEROP PREPROVISIONING

— A00007072 required the new Logical GroupType to be defined in the Core. This new GroupType is provided by A00007071.

- Features which have an interaction with A00007071:
  - none

## 1.6 Applicable customer facing sections

### Fault Management

|        |       |
|--------|-------|
| Logs   | _____ |
| Alarms | __X__ |

### Configuration

|                    |       |
|--------------------|-------|
| Upgrades           | __X__ |
| Data Schema        | __X__ |
| User Interface     | __X__ |
| Element Management | __X__ |
| Security           | _____ |
| Service Order      | _____ |
| Office Parameters  | _____ |

|                                   |       |
|-----------------------------------|-------|
| Accounting (includes AMA billing) | _____ |
|-----------------------------------|-------|

|                                                 |       |
|-------------------------------------------------|-------|
| Performance (includes operational measurements) | _____ |
|-------------------------------------------------|-------|

## 1.7 Glossary

| Acronym | Definition                                               |
|---------|----------------------------------------------------------|
| ASPEN   | Nortel proprietary GW control protocol (not an acronym). |
| BLM     | Business Line Management                                 |
| CLLI    | Common Language Location Identifier                      |
| CM      | Computing Module                                         |
| CMT     | Call Server 2000 Management Tools                        |
| CORBA   | Common Object Request Broker Architecture                |
| CPE     | Customer Premises Equipment                              |
| CS      | Call Server                                              |



|        |                                                                     |
|--------|---------------------------------------------------------------------|
| CS2K   | Call Server 2000                                                    |
| DDMS   | DMS Data Management System                                          |
| DMS    | Digital Multiplex System                                            |
| DTC    | Digital Trunk Controller                                            |
| DTCI   | ISDN Digital Trunk Controller                                       |
| DTD    | Document Type Definition                                            |
| EPID   | End Point Identifier                                                |
| ETSI   | European Telecommunications Standards Institute                     |
| GPS    | Global Product Support                                              |
| GUI    | Graphical User Interface                                            |
| GW     | Gateway                                                             |
| GPC    | Gateway Controller                                                  |
| GPC EM | Gateway Controller Element Manager                                  |
| H.323  | Industry protocol for GW/GK<->GW/GK communication (not an acronym). |
| HLD    | High Level Design                                                   |
| HTML   | HyperText Markup Language                                           |
| IDL    | Interface Definition Language                                       |
| IP     | Internet Protocol                                                   |
| ITA    | Internet Transparency Agent                                         |
| JAR    | Java Archive                                                        |
| JDBC   | Java Database Connectivity                                          |
| JNLP   | Java Network Launching Protocol                                     |
| JWS    | Java Web Start                                                      |
| LAN    | Local Area Network                                                  |
| LTC    | Line/Trunk Controller                                               |
| MEGACO | H.248. Industry protocol for MG/MGC <->MG/MGC communication.        |
| MG     | Media Gateway                                                       |
| MGC    | Media Gateway Controller                                            |
| MGCP   | Media Gateway Control Protocol                                      |

|       |                                                           |
|-------|-----------------------------------------------------------|
| MIB   | Management Information Block                              |
| MI2   | Manatee Iteration II                                      |
| MOP   | Method of Procedure                                       |
| MTC   | Maintenance                                               |
| NA    | North American                                            |
| NAT   | Network Address Translator                                |
| NN    | Node Number                                               |
| NPM   | Network Patch Manager                                     |
| NTNA  | Northern Telecom North American (proprietary PRI variant) |
| NV    | Network View                                              |
| OAM&P | Operations, Administration, Maintenance and Provisioning  |
| OSS   | Operation Support System                                  |
| OSSDI | OSS Data Interface                                        |
| PRI   | Primary Rate Interface                                    |
| PLM   | Product Line Management                                   |
| PSTN  | Public Switched Telephone Network                         |
| PTM   | Packet Telephony Manager                                  |
| RMGC  | Redirecting Media Gateway Controller                      |
| SDM   | SuperNode Data Manager                                    |
| SESM  | Succession Element and Sub-Element Manager [system]       |
| SNMP  | Simple Network Management Protocol                        |
| SQL   | Structured Query Language (for DBs)                       |
| SSPFS | Succession Solaris Platform Foundation Software           |
| SS7   | Signaling System 7                                        |
| TCP   | Transmission Control Protocol                             |
| TDM   | Time Division Multiplexing                                |
| TID   | Terminal Identifier                                       |
| TMM   | Trunk Maintenance Manager                                 |
| TN    | Terminal Number                                           |
| XML   | Extensible Markup Language                                |

## 2: Fault Management for A00007071

### 2.1 Fault management strategy

This activity is responsible for providing a flexible system that allows users to define Gateway (GW) profiles without making software updates. To this end, a certificate (XML document) polling strategy is being developed that will scan the SSPFS file system for new or removed certificates. With this strategy, the potential for error situations arise, and need to be handled without using an interactive interface. Therefore, this activity will amend the alarm system to include new alarms that are related to the importation and removal of certificates (profiles). The alarms are triggered from functionality included in the GWCEM part of the CMT.

The following conditions require amendments to the alarm system:

- Syntax errors are encountered when a new certificate is polled
- Field incompatibility problems are present when a new certificate is polled
- A certificate is deleted and GWs exist that are still using this profile

### 2.2 Fault management tools and utilities

There are two CMT alarm GUIs. One shows active alarms on the managed devices and the other shows the alarm history. This activity will update alarms associated with the GWCEM Network Element.

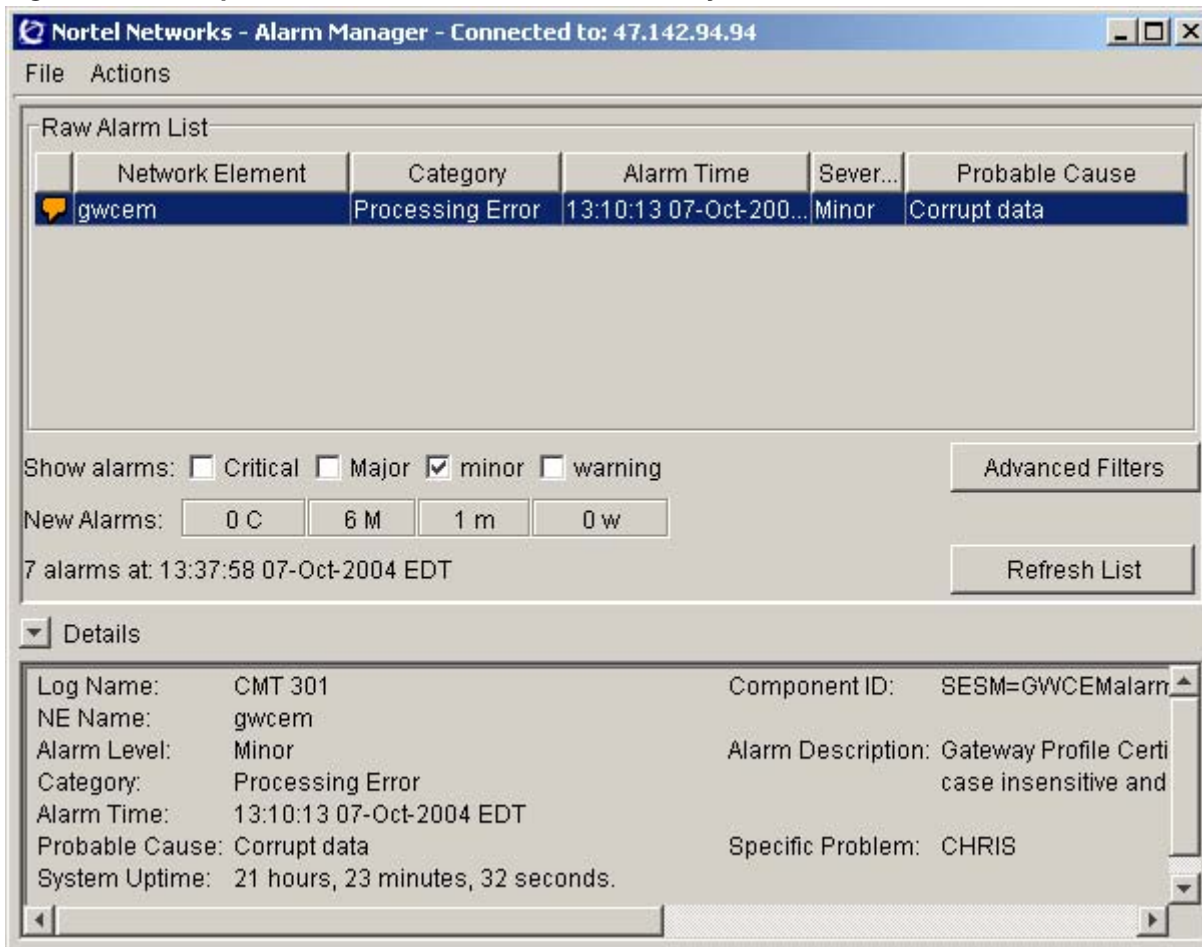
### 2.3 Alarms

At least two new alarms will be introduced with the introduction of this feature. The following properties are included:

- Network Element: gwcem
- Category: Processing Error
- Severity: Minor
- Probable Cause: Certificate corruption
- Duration: Remains active until the alarm condition is cleared
- Action for new certificate: Replace the certificate with a new version without syntax or content problems
- Action for deleted certificate: Remove GWs that use the deleted certificate or replace deleted certificate
- Interfaces: This alarm is generated by the certificate poller on the CMT

#### 2.3.1 GWCEM Certificate Alarms

An example of a GWCEM Certificate Alarm is listed below. This alarm is realized when an issue is discovered that is related to a problem with a Certificate or existing Profile.

**Figure 37 Example of a GWCEM Certificate Alarm Body**

### 2.3.1.1 Corrupt Certificate Alarm

A Corrupt Certificate Alarm is realized when the syntax error is recognized in a Certificate. Certificate syntax must conform to rules enforced by the XML schema. This schema is located in the /opt/nortel/NTsesm/xsd/certificateif directory and should be used as a guideline for certificate creation. If the rules for creating a certificate are violated then a Corrupt Alarm is raised.

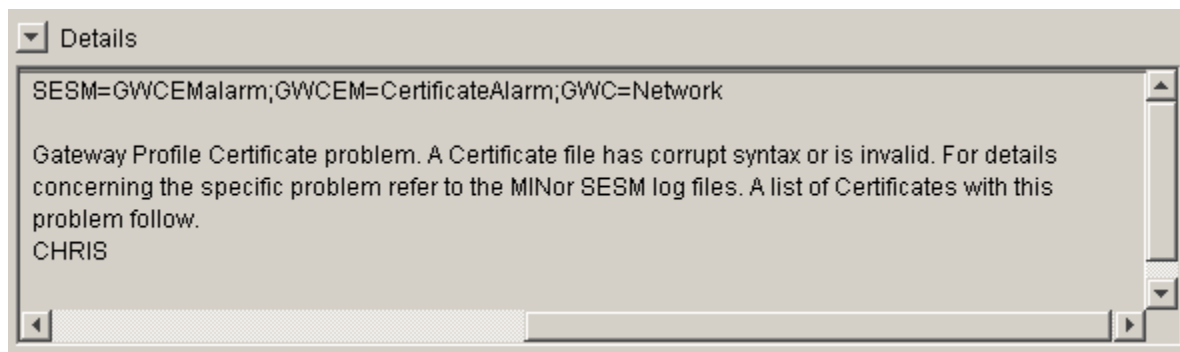
In addition to syntax, some rules have been built into software that disallow combinations of some fields. In general, only blatantly incorrect combinations are tagged and it is the responsibility of the Certificate creator to define valid Certificates. However, some combinations will cause Corrupt Alarms to be generated.

#### 2.3.1.1.1 Clearing a Corrupt Alarm

A Corrupt Alarm is cleared by updating the Certificate file so that the problem listed is no longer present. In addition, Certificate files that have not been

successfully imported into the system can be removed without realizing additional alarms.

**Figure 38 GWCEM Corrupt Certificate Alarm Detail**



### 2.3.1.2 Duplicate Certificate Alarm

A Duplicate Certificate Alarm is realized when more than one Certificate with the same name is detected in the Nortel or Third Party certificate directories. Duplicating a certificate name is not allowed. Certificate names are case insensitive so the name XYZ.certificate is treated as a duplicate of the name xyz.certificate. In addition, duplicates span both the Nortel and the Third Party directories. Therefore, the XYZ.certificate can not co-exist in both the Nortel and Third Party directories.

#### 2.3.1.2.1 Clearing a Duplicate Alarm

A Duplicate Alarm is cleared by simply removing the Certificate file that caused the duplication.

**Figure 39 GWCEM Duplicate Certificate Alarm Detail**



### 2.3.1.3 Delete Certificate Alarm

Third Party Certificates/Profiles can be removed from the system by removing the associated Certificate File. If a Certificate file is removed that has GWs associated with it a Delete Alarm is raised. For this case, the corresponding profile is not removed from the system.

### 2.3.1.3.1 Clearing a Delete Alarm

A Delete Certificate Alarm is cleared by replacing the Certificate file. In addition, all of the GWs can be removed for the system that are associated with the Certificate and the alarm will be cleared. This action will also remove the Certificate.

**Figure 40 GWCEM Delete Certificate Alarm**



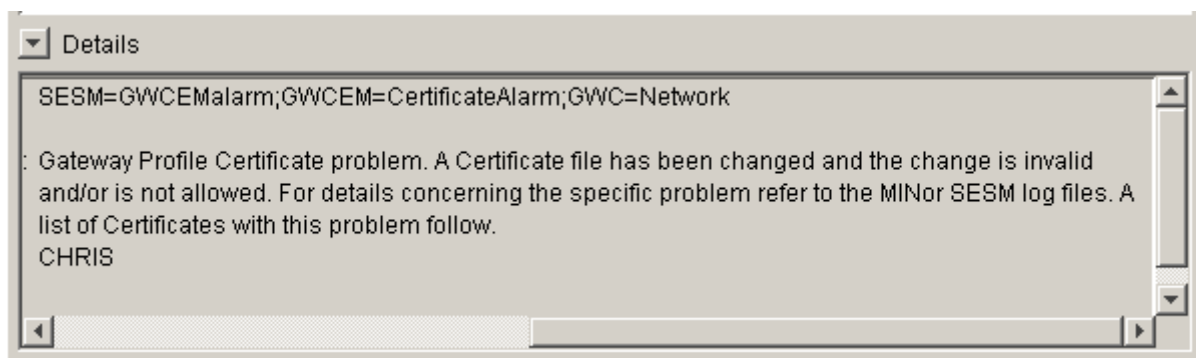
### 2.3.1.4 Certificate Changed Alarm

A Change Certificate Alarm is realized when an existing profile is changed and one or more of the fields that are changed are not allowed.

#### 2.3.1.4.1 Clearing a Changed Alarm

A Changed Alarm is cleared by replacing the field that has been changed to the original value.

**Figure 41 GWCEM Changed Certificate Alarm Detail**



### 2.3.1.5 Missing Certificate Alarm

A Missing Certificate Alarm is realized when a Nortel Certificate has been removed from the Nortel directory or changed to a different name. Software updates are the only supported means to alter or remove Nortel Certificates.

#### 2.3.1.5.1 Clearing a Missing Alarm

A Missing Alarm is cleared by replacing the Nortel Certificate that was removed.

**Figure 42 GWCEM Missing Certificate Alarm Details**



## 2.4 Logs

MI2 Logs are affected by this activity for two of the alarms listed above. Corrupt alarms and Changed alarms list additional detail when the Minor (MNR) alarms logging level is set. The alarms are raised when the syntax or settings of a certificate is incorrect. In addition, when an invalid change is made to a certificate one of these alarms may be realized. For these cases, addition information is listed with detailed information concerning the nature of the problem. An example of this condition follows:

```
04.10.07 13:55:25.903 MNR (EM) [Thread-25] *** CERTIFICATE  
CORRUPT ALARM *** - Profile name = CISCO_2600
```

```
04.10.07 13:55:25.905 MNR (EM) [Thread-25] The problem is: Element type  
"MxEndpoints" must be declared.
```

As previously mentioned, details concerning the "corrupt and changed" certificate alarms are listed in the CMT minor (MNR) log files. These files can be viewed at the following location  
"/opt/nortel/NTsesm/admin/logs/ptmdebuglog1.mi2.

Restricting the logs to list MNR and above logs only can be accomplished using the MI2Admin tool. This tool is located in the /opt/nortel/NTsesm/bin directory.

## 2.5 Related documentation

- <http://ptm->Documentation->SN06->AlarmLoggingDSUM.doc>
- <http://ptm->Documentation->SN08->Third Party Interop FN>

- <http://ptm->Documentation->SN08->Third Party Interop CN>

## **3: Configuration for A00007071**

### **3.1 Hardware and Software Requirements**

The typical Succession hardware needs to be in place and functional prior to exercising the software provided by this feature. Some related specifics are:

Hardware requirements:

- CORE - available on the XACore (powerpc processor) or SuperNode (88k processor). Not available on the 68k processor or NT40 CMs.

Software requirements:

- CMT - SN08 release or later
- GWC - SN08 release or later
- CORE - SN08 release or later

### **3.2 Initial Configuration**

As a provisioning component of the Succession program, much of this functionality performs as designed with the “typical” hardware being in place. The software loads mentioned above should be installed.

Once the hardware/software is installed and brought into service, the software for this feature is available. Now the ability to provision third party gateways is possible.

### **3.3 Office/Subnet parameters (OP/SP) (CM & SESM)**

N/A

### **3.4 Upgrade Impact**

#### **3.4.1 Dump and Restore (CM)**

CORE - No impact to DUMP and Restore mechanisms. This data is preserved via the existing TabXfr mechanism available to all Core Table Control tables.

#### **3.4.2 Element Management Upgrade**

This activity will affect CMT data profiles that were previously created prior to the SN08 release. Existing profiles have the potential to have multiple protocols assigned to the same profile. This activity will modify these profiles so that a separate and unique profile is listed for each protocol. This modification is performed during installation of the SN08 software and there is no requirement for users to take any action to realize these changes. The



following list of profiles are converted and list the new name and unique protocol assigned:

- NUERA\_GX
  - NUERA\_GX\_ASPEN
  - NUERA\_GX\_MEGACO
- PVG\_7K
  - PVG\_7K\_ASPEN
  - PVG\_7K\_MEGACO
- PVG15K
  - PVG15K\_ASPEN
  - PVG15K\_MEGACO
- PVG15K\_1000
  - PVG15K\_1000\_ASPEN
  - PVG15K\_1000\_MEGACO
- PVG15K\_PARTIAL
  - PVG15K\_PARTIAL\_ASPEN
  - PVG15K\_PARTIAL\_MEGACO
- PVG\_VSP3
  - PVG\_VSP3\_ASPEN
  - PVG\_VSP3\_MEGACO
- PVG\_APG\_VSP3
  - PVG\_APG\_VSP3\_ASPEN
  - PVG\_APG\_VSP3\_MEGACO
- PVG\_APG
  - PVG\_APG\_ASPEN
  - PVG\_APG\_MEGACO

### 3.4.3 Downgrade impact

CORE - From the Core's perspective, there exists two scenarios:

1. Using the existing AbortSwact mechanism, only valid while the Core is still in split mode but after the Swact.

If 3rd party gateways were not provisioned, then no problems using the AbortSwact mechanism. However, if 3rd party gateways were provisioned, then the preswact check for the AbortSwact procedure will

fail because new Lgrp nodes have been provisioned on the “new side” which does not exist on the “old side”. To correct this condition the user is required to match up the “old” and “new” sides. This can be accomplished one of two ways:

- a. delete any newly provisioned 3rd party gateways on the “new side”
  - b. add these 3rd party gateways to the “old side”
2. Sync-ing the Core - assuming the Core is still in split mode and a Swact has not occurred.

This is the simpler case, no new provisioning of 3rd party gateways have occurred due to the fact the Swact has not occurred. So just sync the switch. There is no impact for this case.

CMT - Downgrades of the CMT are accomplished by reinstalling the desired release of software and importing the Oracle data base data that was saved against that version. This activity has not affected current downgrade procedures.

## 3.5 Data schema (DS) (CM, MIBS, RDB)

### 3.5.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------|--------------------------|------------------------------------|
| LGRPINV        | Changed                  | Unchanged                          |

### 3.5.2 Table LGRPINV Database Schema information

#### 3.5.2.1 Name: LGRPINV

Long table name: Logical GRoup INventory

##### 3.5.2.1.1 Functional description

Table LGRPINV is where Logical Groups (Lgrps) are provisioned. Generally speaking Logical Groups are the Cores representation of gateway line concentrating devices (gateway LCDs).

This feature will provide:

- new value for existing field GRPTYPE
- the new optional field, GTWYKEY, will be visible not provisionable.

##### 3.5.2.1.2 Usage sequence and implications (CM Only)

No change to the current datafill sequence, this is Table LGRPINV:

- must be datafilled after table SERVRINV. Table SERVRINV is where the gateway controllers are provisioned.
- must be datafilled prior to table LNINV. Table LNINV is where LENs for this Lgrp are provisioned.

### 3.5.2.1.3 Size

No change in the maximum number of tuples for table LGRPINV.

**Table 2 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                                            |
|------------------------|----------------|----------------|----------------------------------------------------------------------------------|
| LGRPINV                | 0              | 1000           | Memory is automatically allocated in increments of 20 LCDs at a time up to 1000. |

### 3.5.2.1.4 Fields/OIDs

The following table lists fields/OIDs for LGRPINV.

### 3.5.2.1.5 Datafill example

**Table 3 TableLGRPINV field descriptions**

| Field    | New or Changed | Subfield or refinement                                         | Entry         | Explanation and action                                                               |
|----------|----------------|----------------------------------------------------------------|---------------|--------------------------------------------------------------------------------------|
| GRPTYPE  | Changed        | Added new value to existing field                              | GRPTYPE       | This field specifies the type of Logical group: {S,M,C, <b>LL_3rdpty</b> }           |
| LGRPOPTS | Changed        | Added new refinement, GTWYKEY - identifies the hosting gateway | GTWY_TY<br>PE | This field specifies the type of gateway: {NLGW,ABI,CICM,GW,ITP,PVG,UAS}             |
|          |                |                                                                | GTWY_NO       | This field specifies a unique gateway of a certain gateway type: Integer {0 TO 9999} |

The following example illustrates the prompting sequence for the new value for GRPTYPE and new GTWYKEY option in table LGRPINV.

**Figure 43 Prompting sequence for GRPTYPE and option Gateway Key**

```

>table lgrpinv
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: LGRPINV
>add cary 1 0 gwc 1
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
ENTER Y TO CONTINUE PROCESSING OR N TO QUIT
>y
GRPTYPE:
>LL_3RDPTY
LGRPOPTS:
>gtwykey
GTWY_TYPE:
>ITP
GTWY_NO:
>2
LGRPOPTS:
>$

```

Figure 44 on page 1048 shows the changes to the GRPTYPE and LGRPOPTS fields with field ranges.

**Figure 44 Range Values for new GRPTYPE and optional Gateway Key**

```

>table lgrpinv
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: LGRPINV
>ran 3
3 GRPTYPE          LGRP_TYPE
TYPE IS LGRP_TYPE {S,M,C, LL_3RDPTY}
>
>ran LGRPOPTS
4 LGRPOPTS          LGRPINV_OPT_ATTR_VECTOR
TYPE IS LGRPINV_OPT_ATTR_VECTOR VECTOR OF UP TO 3 MULTIPLES WITH
LGRPOPTS           {MTSTAPT,LGRPLOC,GTWYKEY} REFINEMENTS:
{MTSTAPT}           MULTIPLE WITH
SITE_NAME           TABLE OF 4 CHAR'S
VERT_INFO           VECTOR OF UP TO 8 MULTIPLES WITH
VERT_NO             {0 TO 1023}
MTAPTNO             {0 TO 48}
{LGRPLOC}           MULTIPLE WITH
FRAME_TYPE          FRAME_NAME
FLOOR_POSITION      {0 TO 99}
ROW_POSITION        ROW_POS
FRAME_POSITION      {0 TO 99}
SHELF_POSITION      {0 TO 77}
{GTWYKEY}           MULTIPLE WITH
GTWY_TYPE          {NLGW,ABI,CICM,GW,ITP,PVG,UAS}
GTWY_NO           {0-1023}

```

Figure 45 on page 1049 provides a view of a successfully added tuple with the new GRPTYPE field and optional Gateway data.

**Figure 45 Sample LGRPINV Tuple with new GRPTYPE and option Gateway**

```

>table lgrpinv
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: LGRPINV
pos lg 1 0
GRPNO SRVRNAME GRPTYPE LGRPOPTS
-----
CARY 01 0 GWC 1 LL_3RDPTY GTWYKEY ITP 2 $

```

**Key****3.5.2.1.6 Table release history update**

SN08 Feature A00007071:

Modified field: LGRPOPTS

- adding a new GTWYKEY refinement. For more information see “TableLGRPINV field descriptions” on page 1047.

**3.5.2.1.7 Supplementary information**

Limitations:

- The new optional field, GTWYKEY, is only visible not provisionable in SN08.

**3.5.2.1.8 Translation verification and other tools**

Table LGRPINV does not impact translations. Therefore TABAUDIT is the tool used to verify the contents of table LGRPINV. The following figure shows the output from TABAUDIT when it is used to verify Table LGRPINV.

**Figure 46 Sample Tabaudit output for Verifying LGRPINV Table Datafill**

```

>tabaudit
TABAUDIT:
>include lgrpinv

>execute
-----
|          TABAUDIT STATUS          |
-----

The following tables are included:
table LGRPINV (300)

The following tables are excluded:
  From table VERSIONS (0)           to table SERVINV (90).
  From table MGCINV (92)           to table IPINV (299).
  From table X75INFO (301)         to table INWATNPA (1426).

Please confirm ("YES", "Y", "NO", or "N"):
>yes
Creating TABAUDIT summaryfile: SUMMARY$MAP on SFDEV.
Starting DMS data verification ...
Table LGRPINV: New table control.
  Completed tuple checking.
  SUMMARY: Tbl LGRPINV: tuples checked 26, passed 26, failed 0.
Data verification is completed.

```

### 3.6 Service Orders (SO) (CM & SESM)

N/A

### 3.7 Software optionality control (SOC)

N/A

## 3.8 Element Management

### 3.8.1 New/modified GUIs

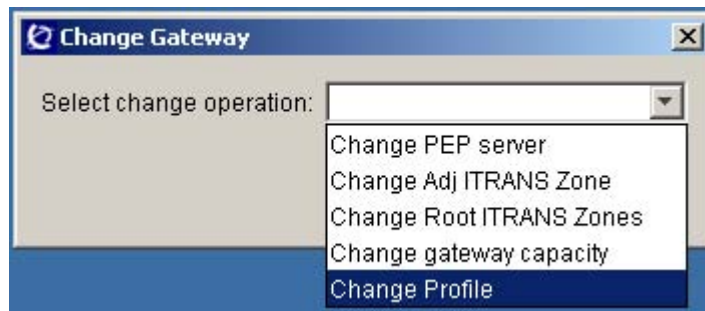
**Table 4 New or modified GUIs**

| GUI name  | NEW, CHANGED, or DELETED |
|-----------|--------------------------|
| Change GW | Changed                  |

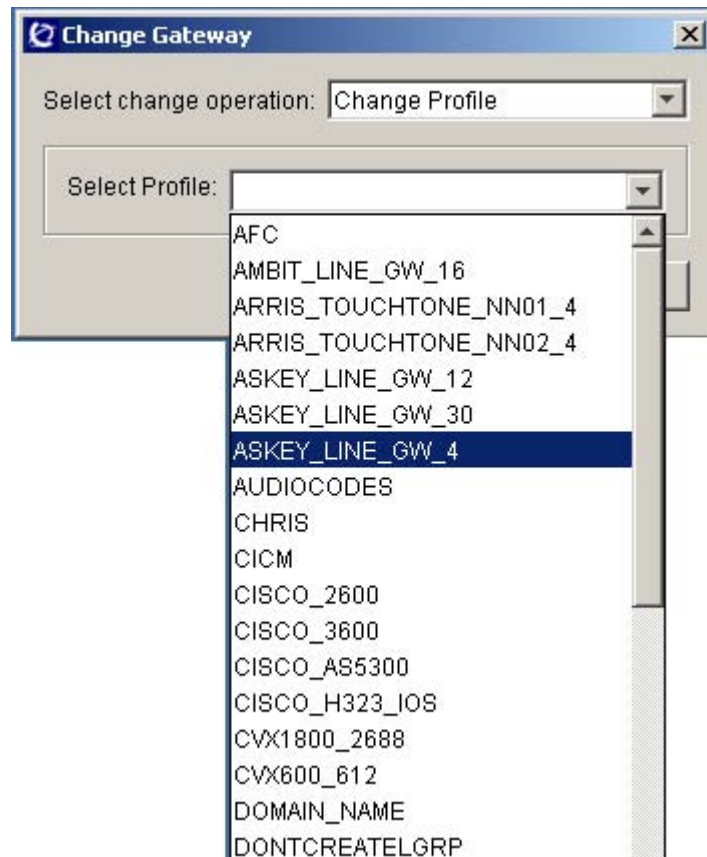
### 3.8.2 GUI information

This activity updates the Change Gateway GUI with a new item in the “pick” list as shown below.

### 3.8.2.1 GUI name: Change Gateway (Profile)



### 3.8.2.2 GUI name: Change Gateway (Profile) expansion



#### 3.8.2.2.1 Functional description

The Change GW dialog is displayed by selecting one or more GWs when in the Provisioning/Gateways Panel of the CMT GUI. This activity adds the "Change gateway profile" item to the pick list of changeable attributes.

Changing a GW from one profile to another is not an operation that is supported for all of the certificate fields, and some fields can only be changed under certain conditions (e.g., you cannot reduce the maximum number of endpoints below the number of endpoints already allocated to the Gateway). A pre-condition for being able to change a GW's profile is that the Compatible Profiles field is set for the profile being changed to. In other words, if you are changing a GW from profile A to profile B, the profile B's "Compatible Profiles" field must have profile A in its list.

Changing a GW to a different profile is a potentially risky operation. Interop personnel should test thoroughly prior to creating a Certificate with the Compatible Profiles field set to a profile other than itself. While some error checking is performed, it is the responsibility of the Certificate creator to make the final decisions concerning if one profile is truly compatible with another.

The user has the ability to change (with limitations) a profile assigned to a Gateway with the following attributes having different values:

- Maximum Endpoints
- Supported Protocol
- Reserve Terminal Mandatory
- Display Physical Location
- Service Type
- Compatible Profiles
- Gateway Name Format
- Endpoint Name Format

#### **3.8.2.2.2 GUI usage and implications**

The Change GW Profiles transaction should be used when a user wants to move a GW from one profile to another. Note that this is the supported method for changing profiles. In contrast, changing the certificate file to realize profile changes is not supported.

## **3.9 User Interface**

### **3.9.1 Defining GW Profiles Using XML Schemas and Certificates**

A profile is the method used by the Nortel Succession products to describe certain behaviors of a GW. With the introduction of this activity, two categories of profiles are defined for use by customers; Nortel profiles and Third Party profiles. Both categories use certificate files to describe their attributes. As previously mentioned, a certificate is an XML document used to uniquely describe all of the behaviors of one profile. Certificate files are made available to the system by existence in the certificate directories. The name given to the certificate file is the unique identifier for the profile. For example,



a certificate file named “UAS.certificate” defines that a UAS profile exists. Using the “certificate” extension is mandatory for all profiles. Details concerning the certificate directories are described in subsequent sections of this document.

The Nortel defined certificates are built into CMT software and are automatically populated in the “Nortel” certificate directory. These profiles are not user modifiable. Because these profiles are built into the Nortel CMT package, they are immediately available for use when the CMT is upgraded to the SN08 release. Availability means that the profile is selectable from the CMT Associate GW GUI and as a profile field value when using the OSSGate Associate GW interface.

Third party certificates are defined and created by Nortel Interop personnel. These profiles are flexible within the bounds of predefined fields and values. In other words, the current set of behaviors is made available to users by defining an XML document, referred to as a “Certificate”, that dictate the features that are appropriate for the GW in question. In subsequent sections of this document, these fields and values are described in detail.

#### **3.9.1.1 Profile Field Definitions and Values**

The following list of GW attributes are made available in the SN08 release and are user definable. Some attributes are obvious concerning their impact, and others, less so. A detailed description of each attribute is provided in the following sections. Where applicable, a GUI capture of the fields affected is listed.

- Maximum Endpoints
- Category
- EndpointType
- GenerateLGRP
- ResvTermMandatory
- ChangeIPAvailable
- DispPhyLocation
- InventroyRole
- InventoryType
- SupportedProtocol
- GWCPProfileNumber
- EPIDGenDesc
- ServiceTypeList
- CompatibleGWProfile

- BearerFormatList
- GatewayNameFormatList
- EndpointNameFormatList

**Note:** For some of the field descriptions below datafill values are listed. These values are included as an aid to understanding and may not accurately reflect actual allowed values. For specifics concerning acceptable field values refer to the schema definition where the CMT application is installed at directory location /opt/nortel/NTsesm/xsd/certificateif.

#### 3.9.1.1.1 MaxEndpoints Field

The maximum endpoints field is used to limit the number of EPs that can be assigned to a GW. For most GWs, this field is used as the default value if the user chooses to omit this value. If a user tries to populate more EPs then this field is set for on a GW, then software restrictions will kick in and disallow the operation.

#### 3.9.1.1.2 Category Field

The category field is a field that dictates endpoint lookup algorithms used in the GWC device. Different endpoint lookup algorithms are used for efficiency. Four categories are available:

- small - This category should be used for GWs with small capacities, 31 or less is suggested.
- large - This category should be used for GWs with large capacities, more than 31 endpoints is suggested.
- audio - This category is a special purpose category used with audio GWs. These GWs use pools of endpoints.
- APG - This is another special purpose category used for APG GWs. It uses virtual TID space that have unique mapping.

Although datafill for this field is defined as enumerated types, these types are mapped to integers and stored with the representation listed below in the database. The following list of mappings is provided for informational purposes only and is subject to change.

**Table 5 Category Mappings**

| Element Value | Database Value |
|---------------|----------------|
| large         | 1              |
| small         | 2              |

| Element Value | Database Value |
|---------------|----------------|
| audio         | 3              |
| APG           | 4              |

### 3.9.1.1.3 Endpoint Type Field

The Endpoint Type field determines how endpoints are managed within succession products. This field affects the ability of a GW to pre-provision endpoints and alters where and when endpoints are provisioned. For the CMT product, some settings auto populate endpoints within the database, and subsequently send these endpoints to the GWC. For the XaCore, this field manages which value, “S”, “M”, “C” or the newly introduced “LL\_3RDPTY” that is datafilled in LGRPTYPE field of LGRPINV table. For a detailed discussion concerning this field, refer to the Data Schema section of this document.

Although datafile for this field is defined as enumerated types, these types are mapped to integers and stored with the representation listed below in the database. The following list of mappings is provided for informational purposes only and is subject to change.

**Table 6 EndpointType Mappings**

| Element Value                 | Database Value | Comments                                 |
|-------------------------------|----------------|------------------------------------------|
| managedLens                   | 1              | Line GWs with managed LGRPs              |
| ue9000Lens                    | 2              | UE9000 GW unique processing              |
| cicmLens                      | 3              | CICM GW unique processing                |
| carrierTrksGwcNN              | 4              | Trunks, no LGRPs                         |
| carrierTrksSubNN              | 5              | Trunks, no LGRPs                         |
| nocarrierTrkGwcNN             | 6              | H.323 GWs                                |
| asynchronousBridgingInterface | 7              | ABI                                      |
| thirdPartyLens                | 8              | Large Line Third Party unique processing |

### 3.9.1.1.4 Generate LGRP Field

The LGRP Generation field is included to dictate whether a new LGRP is created when a GW with the profile in question is associated. This field is applicable to Nortel and Third Party line GWs that allow the system to manage TID allocation. This ability has been added with the introduction of this feature. For example, pre-SN08 small line GWs with a category of small

would only allocate a new LGRP when an existing LGRP was not available with capacity for the new GW that was being added. Category large profiles would always add a new LGRP upon GW creation. This functionality is altered in SN08 so that the decision of whether a new LGRP is created or not is dictated by this newly introduced field, “LGRP Generation”. Indicating “true” for this field means that a GW that is added will cause a new LGRP to be created. “false”, indicates to use existing LGRPs if one exists that still has capacity. Indicating that a new LGRP is created should be taken with caution due to the limited number of LCD nodes available on the XaCore. For a discussion of XaCore LCD nodes, refer to the NTPs.

#### 3.9.1.1.5 Reserved Terminations Mandatory Field

This certificate field is used to dictate the behavior concerning the Associate GW “reserved terminations” value. If this field is left blank in the client, then server behavior is to default this value to the maximum reserved termination value defined in certificate field value “Maximum Endpoints”. For some GWs, it is mandatory that the customer specify this value. In other words, setting the Reserved Terminations Mandatory field to “true” in the certificate forces the user to specify a reserved terminations client value and the system default will not be used. This is enforced by not turning the OK button on at the GUI and by rejecting the command if the OSSGate Associate GW Maximum Termination field is not included. Currently, only GW’s using the H.323 protocol use this restriction and this certificate field is typically be set to “false” for all other GW types.

**Figure 47 GUI fields affected by Rsvd Terms Mandatory Field**

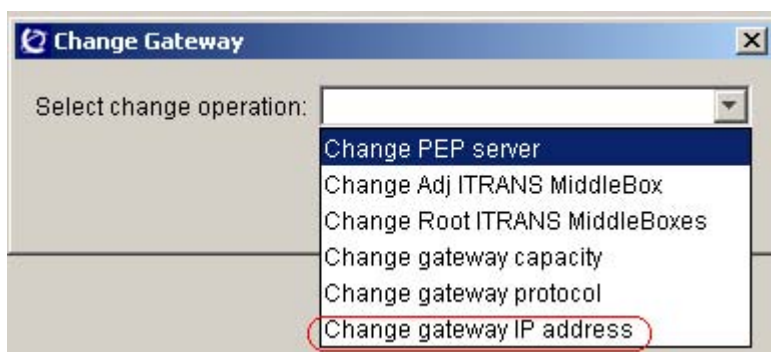
The screenshot shows a dialog box titled "Associate Media Gateway". It contains several input fields and buttons. The "Reserved terminations" field is highlighted with a red rectangle. The "OK" button is also highlighted with a red rectangle. The fields include:

- Gateway name: [text input]
- Gateway IP address: [text input]
- Gateway controller name: [<auto select> dropdown]
- Gateway profile name: [dropdown]
- Reserved terminations: [text input, highlighted]
- Signal Protocol section:
  - Protocol type: [dropdown]
  - Protocol port: [text input]
  - Protocol version: [text input]
- Buttons: OK (highlighted), Cancel

#### 3.9.1.1.6 Change IP Available Field

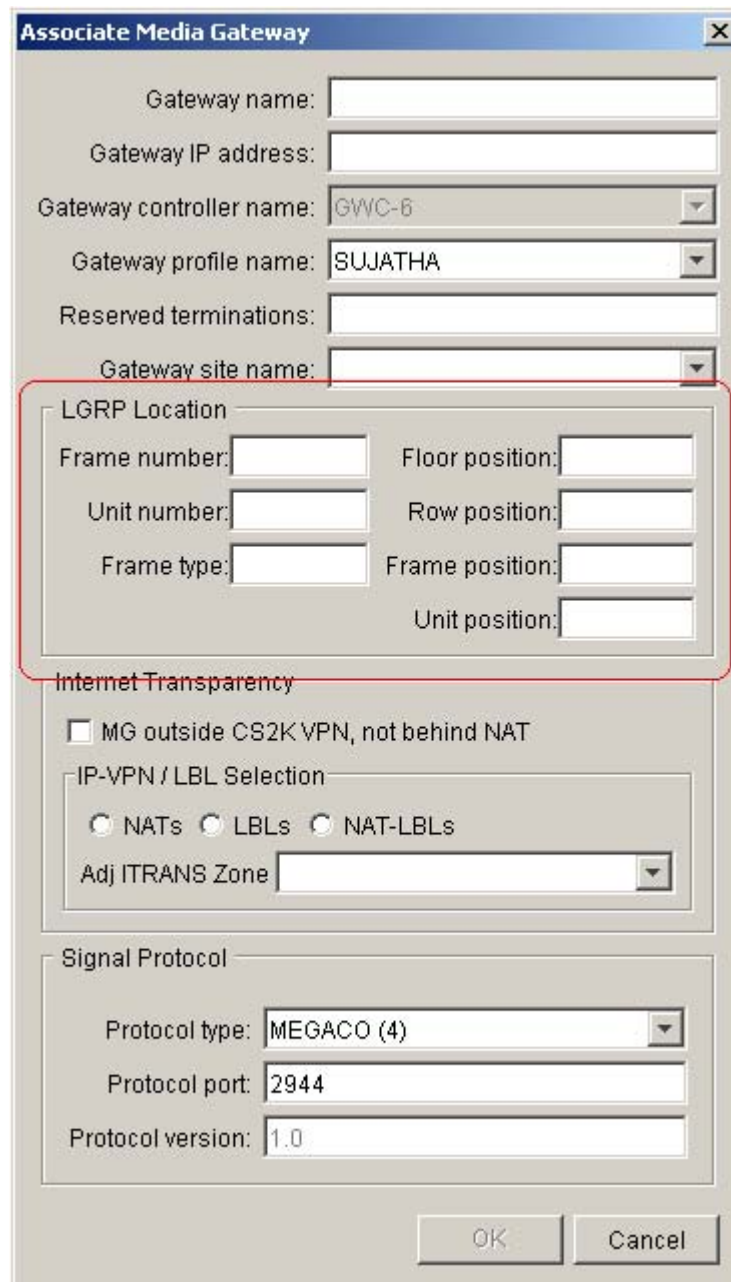
This certificate field is used to dictate the behavior concerning the “pick” list for the GUI operation change GW. If this certificate element is set to “false”, then the “Change gateway IP address” pick is removed from the list of changeable attributes. As of SN08, only H.323 GWs support the change GW IP functionality.

**Figure 48 Change Gateway IP Pick Affected**



#### 3.9.1.1.7 Display Physical Location

The Display Physical Location field is used to indicate that additional fields should be datafilled in the Associate Media Gateway GUI. These fields are used to populate specific LGRP and LEN information. Currently, these fields are unique to the Third Party Large Line and CICM profiles only. For a detailed discussion concerning this topic, refer to SN08 activity Third Party Gateway Provisioning (A00007072).

**Figure 49 Associate Media Gateway Dialog**

The dialog box is titled "Associate Media Gateway" and contains several input fields and sections. A red rectangle highlights the "LGRP Location" section, which includes fields for Frame number, Floor position, Unit number, Row position, Frame type, Frame position, and Unit position. Below this is the "Internet Transparency" section, which includes a checkbox for "MG outside CS2K VPN, not behind NAT", a radio button selection for "IP-VPN / LBL Selection" (NATs, LBLs, NAT-LBLs), and a dropdown for "Adj ITRANS Zone". The "Signal Protocol" section includes a dropdown for "Protocol type" (set to MEGACO (4)), a text field for "Protocol port" (set to 2944), and a text field for "Protocol version" (set to 1.0). The dialog has "OK" and "Cancel" buttons at the bottom right.

Gateway name:

Gateway IP address:

Gateway controller name:

Gateway profile name:

Reserved terminations:

Gateway site name:

**LGRP Location**

Frame number:  Floor position:

Unit number:  Row position:

Frame type:  Frame position:

Unit position:

**Internet Transparency**

☐ MG outside CS2K VPN, not behind NAT

**IP-VPN / LBL Selection**

☐ NATs ☐ LBLs ☐ NAT-LBLs

Adj ITRANS Zone

**Signal Protocol**

Protocol type:

Protocol port:

Protocol version:

OK Cancel

### 3.9.1.1.8 Inventory Role Field

The Inventory Role field dictates the expected use of the GW. Currently, only the "Media GW" role has been defined, but, other uses may be defined for future deliveries.

### 3.9.1.1.9 Inventory Type Field

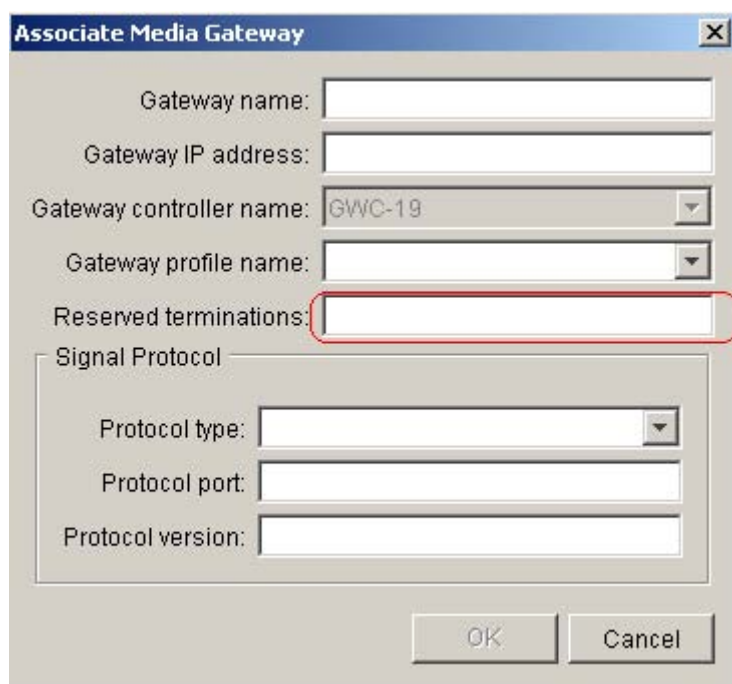
The inventory type field is similar to the Endpoint Type field in that it affects how endpoints are provisioned. Unique behavior is associated with the different values available. This behavior affects generation of LGRPs for lines or trunk behaviors for trunks. The following list is available for datafill in SN08.

**Table 7 Datafill Values for Inventory Type Field**

| DEFINED VALUES      |
|---------------------|
| Large Trunk Gateway |
| H.323 Gateway       |
| Audio Server        |
| Large Line Gateway  |
| Small Line Gateway  |
| Audio Server        |
| CICM                |
| UE9000MG            |
| Third Party         |

### 3.9.1.1.10 Maximum Endpoints Field

As the name implies, the Maximum Endpoint field is a field that dictates the maximum number of endpoints that can be added to a GW. In theory, this field should be less than or equal to the maximum number of endpoints that can be assigned to the GWC it is intended to be provisioned for. Because the profile type for the GWC assignment is not know, range error checking for this field is not performed and it is the responsibility of the certificate creator to assign this field with an appropriate value. For example, if this field is assigned the value of 2000, and the GWC that will use it can only support 1000 endpoints, an error condition would be realized if the user datafilled 2000 in the “reserved terminations” field for the Associate GW operation. This is because the GWCs capacity is overrun. In some situations, this may be deemed appropriate if the GWs capacity is truly 2000. The user has the option of associating the GW with a reserved capacity of less than the value assigned to this certificate field. The screen captures below show the affected fields.

**Figure 50 Associate Media GW Reserved Terminations**

The image shows a dialog box titled "Associate Media Gateway". It contains several input fields and a "Signal Protocol" section. The "Reserved terminations" field is highlighted with a red rectangle.

Gateway name:

Gateway IP address:

Gateway controller name:

Gateway profile name:

Reserved terminations:

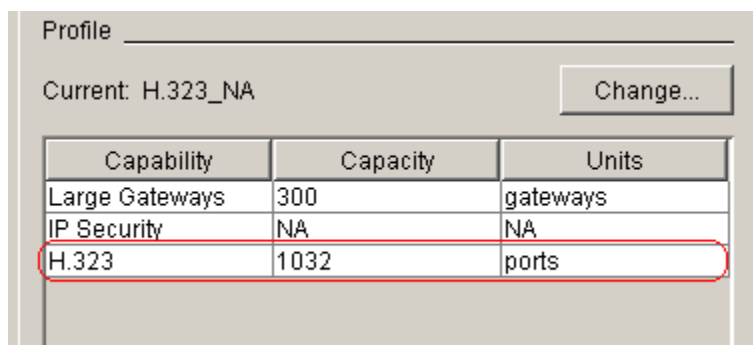
Signal Protocol

Protocol type:

Protocol port:

Protocol version:

OK Cancel

**Figure 51 H.323 GWC Profile Port Capacity**

The image shows a dialog box titled "H.323 GWC Profile Port Capacity". It displays a table with three columns: Capability, Capacity, and Units. The "H.323" row is highlighted with a red rectangle.

Profile

Current: H.323\_NA

| Capability     | Capacity | Units    |
|----------------|----------|----------|
| Large Gateways | 300      | gateways |
| IP Security    | NA       | NA       |
| H.323          | 1032     | ports    |

### 3.9.1.1.11 Supported Protocol Field

As the name implies, the supported profile field is used to define the protocol associated with this profile. Prior to SN08, multiple protocols were available within a profile. This functionality has been altered so that a profile and protocol has a 1 to 1 correspondence. If a GW supports multiple protocols, then a unique certificate should be created for each protocol supported. Profiles that supported multiple protocols prior to the SN08 release have been modified to conform to this behavior. For example, the PVG\_7K profile has been expanded in the SN08 release and is listed as PVG\_7K\_ASPEN and PVG\_7K\_MEGACO.



Although datafile for this field is defined as enumerated types, these types are mapped to integers and stored with the representation listed below in the database. The following list of mappings is provided for informational purposes only and is subject to change.

**Table 8 Protocol Mappings**

| Element Value | Database Value |
|---------------|----------------|
| NCS_PROTOCOL  | 1              |
| ASPEN         | 2              |
| DSM-CC        | 3              |
| MEGACO        | 4              |
| MGCP          | 5              |
| TGCP          | 6              |
| H.323         | 11             |

#### **3.9.1.1.12 GWC Profile Number Field**

The GWC Profile Number field is a field used in the GWC device that dictates the behavior of the GWC. The number sent to the GWC is associated with a unique series of flags in the GWC. These flags instruct the GWC on specific actions to use in the GWC device. For any 3rd party certificate creation, one of the “spare” profiles created for this activity should be used. For details concerning which number should be used, please contact GWC Persistent Data architects and designers.

The following table shows the range of “spare” profile numbers.

**Table 9 Profile numbers and reference gateways**

| Profile numbers | Reference gateways       |
|-----------------|--------------------------|
| 100 - 124       | Arris MTA                |
| 125 - 149       | Motorola MTA             |
| 150 - 174       | Generic MTA              |
| 175 - 224       | IAD                      |
| 225 - 249       | UE9000                   |
| 250 - 274       | CentrexIP Client Manager |
| 275 - 299       | MG9000                   |
| 300 - 324       | ABI                      |
| 325 - 349       | MG15000 (previously PVG) |

**Table 9 Profile numbers and reference gateways**

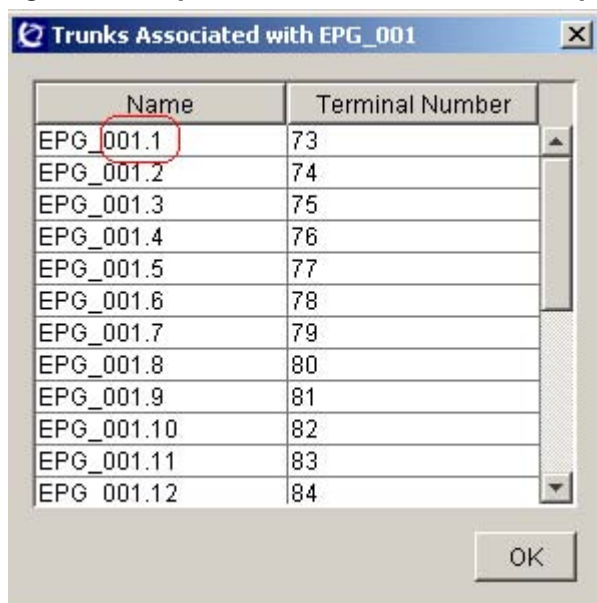
| Profile numbers | Reference gateways               |
|-----------------|----------------------------------|
| 350 - 374       | CVX                              |
| 375 - 399       | AudioCodes PRI                   |
| 400 - 424       | Upgrade MG15000 (previously PVG) |
| 425 - 449       | Nuera trunking GW                |
| 450 - 474       | TGCP                             |
| 475 - 499       | Nortel BCM                       |
| 500 - 524       | Nortel Meridian 1                |
| 525 - 549       | CISCO 2600 / 3600 / AS5300       |
| 550 - 574       | Nortel Westell                   |
| 575 - 599       | H.323 proxy gateway              |

**3.9.1.1.13 EPID Generation Field**

The EPID Generation field is used to describe the behaviors of endpoint groups that are expanded. It dictates properties such as using a “.” or “/” as naming delimiters and other attributes as listed in the table below. An example of H.323 expansion is listed below in the screen shot. This example uses the auto1 expansion. With this expansion, a “.” is used for the delimiter, the numbering starts at 1, and it is not “0” padded.

**Table 10 EndpointDesc Mappings**

| Element Value | Delimiter | Channel Start | Pad Supported |
|---------------|-----------|---------------|---------------|
| manual        |           | 1             | N             |
| auto1         | .         | 1             | N             |
| auto2         | .         | 1             | Y             |
| auto3         | /         | 1             | N             |
| auto4         | /         | 1             | Y             |
| auto5         | /         | 0             | N             |
| auto6         | /         | 0             | Y             |
| auto7         | .         | 0             | N             |
| auto8         | .         | 0             | Y             |

**Figure 52 Expansion of a H.323 Carrier Group Using auto01**

#### 3.9.1.1.14 Service Type Field

The Service Type field dictates the capabilities of the GW. Some GWs may have multiple capabilities within this list and can be assigned several values. For instance, some gateways have middle box “ITRANS” or “DQOS” abilities in addition to being a “line” GW.

The following table lists the current set of defined Service Type values that can be assigned. Although datafile for this field is defined as enumerated types, these types are mapped to integers and stored with the representation listed below in the database. The following list of mappings is provided for informational purposes only and is subject to change.

**Table 11 ServiceType Mappings**

| Element Value | Database Value |
|---------------|----------------|
| line          | 0              |
| trunk         | 1              |
| audio         | 2              |
| APG           | 3              |
| DQOS          | 4              |
| ITRANS        | 5              |

| Element Value | Database Value |
|---------------|----------------|
| H323          | 6              |
| ITRANS_ROAM   | 7              |

#### 3.9.1.1.15 Compatible Gateway Profile

The compatible GW profile field describes which profiles are compatible with this profile. This field should be set to the name of the profile being defined at a minimum.

#### 3.9.1.1.16 Bearer Fabric Field

The bearer fabric field is an optional field used to dictate the type of network used by GW. Two ATM versions, AAL1 and AAL2, are available and an IP version too. For more information concerning specifics of this field, refer to the Tri-modal provisioning (A00003487) documentation.

#### 3.9.1.1.17 Gateway Name Format Field

The data within this tag is used to define the syntax for the name of the Gateway associated with this certificate/profile. Gateway association/addition will be rejected if the gateway name does not conform to this definition. See section **NameFormatsType Schema** for a more complete description of the sub-tags which make up this syntax definition.

#### 3.9.1.1.18 Endpoint Name Format Field

The data within this tag is used to define the syntax for the name of the Endpoints added to a gateway associated with this certificate/profile. No endpoints will be allowed to be created which do not conform to this definition. See section **NameFormatsType Schema** for a more complete description of the sub-tags which make up this syntax definition.

### 3.9.1.2 XML Schema Definitions for Certificates

#### 3.9.1.2.1 Base Certificate Schema

The base certificate schema is used to define a profile. Many of the fields are mandatory, but, a few are optional as indicated by the “minOccurs=”0” terminology. These fields allow users to define a profile’s certificate as described in this document.

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

<xsd:include schemaLocation="../../../xsd/certificateif/certificateTypes.xsd" />

<xsd:element name="certificate">
  <xsd:complexType>
    <xsd:sequence>
      <xsd:element name="MaxEndpoints" type="maxEndpointsType" />
```

```

        <xsd:element name="Category" type="categoryType" />
        <xsd:element name="EndpointType" type="endpointTypeType" />
        <xsd:element name="GenerateLGRP" type="stringBoolean" />
        <xsd:element name="ResvTermMandatory" type="stringBoolean" />
        <xsd:element name="ChangeIPAavailable" type="stringBoolean" />
        <xsd:element name="DispPhyLocation" type="stringBoolean" />
        <xsd:element name="InventoryType" type="inventoryTypeType" />
        <xsd:element name="InventoryRole" type="inventoryRoleType" />
        <xsd:element name="SupportedProtocol" type="supportedProtocolType" />
        <xsd:element name="GWCProfileNumber" type="profileNumberType" />
        <xsd:element name="EPIDGenDesc" type="EPIDGenDescType" />
        <xsd:element name="ServiceTypeList" type="serviceTypeListType"
minOccurs="1" maxOccurs="7" />
        <xsd:element name="CompatibleGWProfileList" type="profileNameType"
minOccurs="1" maxOccurs="5" />
        <xsd:element name="BearerFabricList" type="bearerFabricListType"
minOccurs="0" maxOccurs="5" />
        <xsd:element name="GatewayNameFormatList" type="nameFormatsType" />
        <xsd:element name="EndpointNameFormatList" type="nameFormatsType" />
    </xsd:sequence>
</xsd:complexType>
</xsd:element>

</xsd:schema>

```

### 3.9.1.2.2 CertificateTypes Schema

The Certificate Types Schema is used in conjunction with the certificate schema listed above and defines allowable values for the base certificates values. Typically, an enumerated list of values is listed. However, some elements has ranges of values that can be used or allow a free form string value.

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
version="1.0"
xml:lang="en" >

<xsd:include schemaLocation="../../../xsd/namesif/nameFormatsType.xsd" />

<xsd:simpleType name="profileNumberType">
    <xsd:restriction base="xsd:integer">
        <xsd:minInclusive value="1" />
        <xsd:maxInclusive value="250" />
    </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="profileNameType">
    <xsd:restriction base="xsd:string">
        <xsd:minLength value="1" />
        <xsd:maxLength value="32" />
    </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="stringBoolean">
    <xsd:restriction base="xsd:token">
        <xsd:enumeration value="true"/>
        <xsd:enumeration value="false"/>
    </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="maxEndpointsType">
    <xsd:restriction base="xsd:integer">

```

```
<xsd:minInclusive value="0" />
<xsd:maxInclusive value="4094" />
</xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="serviceTypeListType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="line"/>
    <xsd:enumeration value="trunk"/>
    <xsd:enumeration value="audio"/>
    <xsd:enumeration value="APG"/>
    <xsd:enumeration value="DQOS"/>
    <xsd:enumeration value="ITRANS"/>
    <xsd:enumeration value="H323"/>
    <xsd:enumeration value="ITRANS_ROAM"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="categoryType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="niltype"/>
    <xsd:enumeration value="LARGE"/>
    <xsd:enumeration value="SMALL"/>
    <xsd:enumeration value="AUDIO"/>
    <xsd:enumeration value="APG"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="inventoryRoleType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="Media Gateway"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="inventoryTypeType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="Large Trunk Gateway"/>
    <xsd:enumeration value="H.323 Gateway"/>
    <xsd:enumeration value="Audio Server"/>
    <xsd:enumeration value="Large Line Gateway"/>
    <xsd:enumeration value="Small Line Gateway"/>
    <xsd:enumeration value="Audio Server"/>
    <xsd:enumeration value="CICM"/>
    <xsd:enumeration value="UE9000MG"/>
    <xsd:enumeration value="Third Party"/>
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="EPIDGenDescType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="manual"/>
    <xsd:enumeration value="auto1"/>
    <xsd:enumeration value="auto2"/>
    <xsd:enumeration value="auto3"/>
    <xsd:enumeration value="auto4"/>
    <xsd:enumeration value="auto5"/>
    <xsd:enumeration value="auto6"/>
    <xsd:enumeration value="auto7"/>
    <xsd:enumeration value="auto8"/>
  </xsd:restriction>
</xsd:simpleType>

<!-- PVG to Aspen is currently the only supported profile change -->
<xsd:simpleType name="compatibleGWProfileListType">
```

```
<xsd:restriction base="xsd:token">
  <xsd:enumeration value="" />
</xsd:restriction>
</xsd:simpleType>

<xsd:complexType name="supportedProtocolType">
  <xsd:sequence>
    <xsd:element name="protocolName" type="protocolType"/>
    <xsd:element name="version" type="xsd:decimal"/>
  </xsd:sequence>
</xsd:complexType>

<xsd:simpleType name="protocolType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="none" />
    <xsd:enumeration value="ncsprotocol" />
    <xsd:enumeration value="aspen" />
    <xsd:enumeration value="dsmcc" />
    <xsd:enumeration value="megaco" />
    <xsd:enumeration value="mgcp" />
    <xsd:enumeration value="tgcp" />
    <xsd:enumeration value="sipbcpt" />
    <xsd:enumeration value="h323" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="endpointTypeType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="niltype" />
    <xsd:enumeration value="managedLens" />
    <xsd:enumeration value="ue9000Lens" />
    <xsd:enumeration value="cicmLens" />
    <xsd:enumeration value="carrierTrksGwcNN" />
    <xsd:enumeration value="carrierTrksSubNN" />
    <xsd:enumeration value="nocarrierTrkGwcNN" />
    <xsd:enumeration value="thirdPartyLens" />
    <xsd:enumeration value="asynchronousBridgingInterface" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="marketRestrictionListType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="NA" />
    <xsd:enumeration value="International" />
  </xsd:restriction>
</xsd:simpleType>

<xsd:simpleType name="bearerFabricListType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="AAL1" />
    <xsd:enumeration value="AAL2" />
    <xsd:enumeration value="IP" />
  </xsd:restriction>
</xsd:simpleType>

</xsd:schema>
```

### 3.9.1.2.3 NameFormatsType Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" version="1.0" xml:lang="en" >

<!-- ***** -->
<!-- * Name Format XSD Definition -->
<!-- ***** -->
<xsd:complexType name="nameFormatsType">
  <xsd:sequence>
    <xsd:element name="nameFormat" minOccurs="0" maxOccurs="70">
      <xsd:complexType>
        <xsd:all>
          <xsd:element name="appDataList" type="appDataListType" minOccurs="0"/>
          <xsd:element name="name" type="xsd:token" minOccurs="1"/>
          <xsd:element name="minLength" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="maxLength" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="delimiters" type="xsd:string" minOccurs="0"/>
          <xsd:element name="forceDelimiterOrder" type="xsd:string" minOccurs="0"/>
          <xsd:element name="template" type="xsd:string" minOccurs="0"/>
          <xsd:element name="pattern" type="xsd:string" minOccurs="0"/>
          <xsd:element name="minTokens" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="maxTokens" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="enabled" type="xsd:boolean" minOccurs="0"/>
          <xsd:element name="tokenFormats" type="tokenFormatsType" minOccurs="0"/>
        </xsd:all>
        <xsd:attribute name="formatKey" type="xsd:token" use="required"/>
        <xsd:attribute name="applyToPattern" type="xsd:string" use="optional"/>
        <xsd:attribute name="enabled" type="xsd:boolean" use="optional"/>
      </xsd:complexType>
    </xsd:element>
  </xsd:sequence>
  <xsd:attribute name="enabled" type="xsd:boolean" use="optional"/>
</xsd:complexType>

<!-- ***** -->
<!-- * Define tokenFormatType -->
<!-- ***** -->
<xsd:complexType name="tokenFormatsType">
  <xsd:sequence>
    <xsd:element name="tokenFormat" minOccurs="0" maxOccurs="40">
      <xsd:complexType>
        <xsd:all>
          <xsd:element name="name" type="xsd:token" minOccurs="0"/>
          <xsd:element name="type" type="tokenType" minOccurs="0"/>
          <xsd:element name="template" type="xsd:string" minOccurs="0"/>
          <xsd:element name="minLength" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="maxLength" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="values" type="xsd:string" minOccurs="0"/>
          <xsd:element name="minValue" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="maxValue" type="xsd:nonNegativeInteger" minOccurs="0"/>
          <xsd:element name="pattern" type="xsd:string" minOccurs="0"/>
          <xsd:element name="zeroPadding" type="zeroPaddingType" minOccurs="0"/>
          <xsd:element name="validRanges" type="xsd:string" minOccurs="0"/>
          <xsd:element name="invalidRanges" type="xsd:string" minOccurs="0"/>
          <xsd:element name="case" type="caseType" minOccurs="0"/>
        </xsd:all>
        <xsd:attribute name="tokenKey" type="xsd:token" use="required"/>
      </xsd:complexType>
    </xsd:element>
  </xsd:sequence>
</xsd:complexType>

<!-- ***** -->
<!-- * Define tokenFormatType -->
<!-- ***** -->
<xsd:simpleType name="tokenType">
```



```

    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="alphanumeric" />
      <xsd:enumeration value="alpha" />
      <xsd:enumeration value="alphanumericrequiredalpha" />
      <xsd:enumeration value="numeric" />
    </xsd:restriction>
  </xsd:simpleType>

<!-- ***** -->
<!-- * Define appDataListType -->
<!-- ***** -->
<xsd:complexType name="appDataListType">
  <xsd:sequence>
    <xsd:element name="appData" type="appDataType" maxOccurs="40"/>
  </xsd:sequence>
</xsd:complexType>

<!-- ***** -->
<!-- * Define appDataType -->
<!-- ***** -->
<xsd:complexType name="appDataType" >
  <xsd:attribute name="name" type="xsd:token" use="required" />
  <xsd:attribute name="value" type="xsd:string" use="optional" />
  <xsd:attribute name="type" type="xsd:token" use="optional" />
</xsd:complexType>

<!-- ***** -->
<!-- * Define caseType -->
<!-- ***** -->
<xsd:simpleType name="caseType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="upper" />
    <xsd:enumeration value="lower" />
    <xsd:enumeration value="mixed" />
  </xsd:restriction>
</xsd:simpleType>

<!-- ***** -->
<!-- * Define zeroPaddingType -->
<!-- ***** -->
<xsd:simpleType name="zeroPaddingType">
  <xsd:restriction base="xsd:string">
    <xsd:enumeration value="allow" />
    <xsd:enumeration value="disallow" />
    <xsd:enumeration value="force" />
  </xsd:restriction>
</xsd:simpleType>

<!-- ***** -->
<!-- * Tag Definitions -->
<!-- ***** -->
<!-- * The string "none" can be used for any non-numeric tag value to cause -->
<!-- * it to be ignored. Leaving the tag out entirely yields the same result. -->
<!-- * -->
<!-- * <nameFormats> Start of the naming format description. There will -->
<!-- * be one <nameFormat> for each name format definition. -->
<!-- * -->
<!-- * <nameFormat formatKey=name applyToPattern=pattern> -->
<!-- * Start of a naming format. Will be -->
<!-- * referenced by formatKey (which is mandatory). -->
<!-- * -->
<!-- * The applyToPattern attribute is optional -->
<!-- * and can be used to restrict this format check to -->
<!-- * only those names which match the pattern. In other -->

```

```

<!-- * words, if used, and the name matches the pattern, -->
<!-- * then the rest of the rules which follow must also -->
<!-- * be successful. However, if used, and the name does -->
<!-- * NOT match the pattern, then the name is not checked -->
<!-- * and a successful match is always declared for this -->
<!-- * formatKey. -->
<!-- * -->
<!-- * To put this another way, if the name does not match -->
<!-- * the pattern, the "enabled" tag is dynamically set to -->
<!-- * false. -->
<!-- * -->
<!-- * The definition of "pattern" is defined in the Java -->
<!-- * class Pattern. -->
<!-- * -->
<!-- * <name> descriptive name for this format; optional -->
<!-- * -->
<!-- * <enabled> true - checking enabled for this format -->
<!-- * false - checking disabled -->
<!-- * optional- default is disabled -->
<!-- * -->
<!-- * <minLength> minimum overall length of the name; optional -->
<!-- * -->
<!-- * <maxLength> maximum overall length of the name; optional -->
<!-- * -->
<!-- * <delimiters> string containing all recognized name delimiters; -->
<!-- * if more than 1 potential delimiter, include 1 -->
<!-- * instance of delimiter for each position it should -->
<!-- * hold, e.g. _._ matches A_B.C.D_E; -->
<!-- * space - the space character will be used as the -->
<!-- * delimiter value; -->
<!-- * -->
<!-- * <forceDelimiterOrder> -->
<!-- * -->
<!-- * true - when multiple delimiters are specified (see -->
<!-- * <delimiters> tag above), requires that they -->
<!-- * appear in the order listed. -->
<!-- * false - does not require multiply listed delimiters -->
<!-- * to appear in order within the string. -->
<!-- * optional, default = false; -->
<!-- * -->
<!-- * <forceDelimiterOrder> -->
<!-- * -->
<!-- * true - when multiple delimiters are specified (see -->
<!-- * <delimiters> tag above), requires that they -->
<!-- * appear in the order listed. -->
<!-- * false - does not require multiply listed delimiters -->
<!-- * to appear in order within the string. -->
<!-- * optional, default = false; -->
<!-- * -->
<!-- * <minTokens> minimum number of tokens; optional -->
<!-- * -->
<!-- * <maxTokens> maximum number of tokens; optional -->
<!-- * -->
<!-- * <template> template showing how name should look-used for -->
<!-- * error reporting only; optional -->
<!-- * -->
<!-- * <pattern> can be used to define a names properties, including -->
<!-- * delimiters, number of alpha/numeric characters, etc. -->
<!-- * Refer to the Pattern class in the JavaDocs for more -->
<!-- * details on its syntax; optional -->
<!-- * -->
<!-- * <appData name= value= type= > -->
<!-- * As many optional appData tags can be included -->
<!-- * as desired. This data is stored with the -->
<!-- * format and can be retrieved by an application. -->
<!-- * The appData has not effect on the parsing. -->
<!-- * -->
<!-- * When an application does a name format check -->
<!-- * against a token key, all matching formats will -->
<!-- * include the appData, which can be retrieved by -->
<!-- * the application. See NameFormat.getAppData() -->

```

```

<!-- *           for more details.  The usage of the appData           -->
<!-- *           data is strictly application driven.  Below are       -->
<!-- *           is an example of a current usage.                     -->
<!-- *
<!-- *           This case is setting the default port capacity for    -->
<!-- *           a carrier whose name matches the format and is        -->
<!-- *           North American to 31.                                  -->
<!-- *           <appData name="CapacityDefault"                        -->
<!-- *                   value="31"                                     -->
<!-- *                   type="NA"/>                                    -->
<!-- *
<!-- *           <tokenFormats> Start of the token descriptions.  There will be one -->
<!-- *           set of <tokenFormat> for each token in the name.       -->
<!-- *           The name will be parsed into tokens using the         -->
<!-- *           <delimiters> tag, then checked for format against      -->
<!-- *           these blocks.  Order is significant, as the tokens     -->
<!-- *           are expected to be checked in the same order as       -->
<!-- *           they are defined here.                                  -->
<!-- *
<!-- *           <tokenFormat tokenKey=name>                             -->
<!-- *                   One of these blocks exist for each token.      -->
<!-- *
<!-- *           <name>           descriptive name for this token (optional) -->
<!-- *
<!-- *           <type>           type of token (optional):              -->
<!-- *                   numeric - must be an integer                   -->
<!-- *                   alphanumeric - must contain letters,           -->
<!-- *                               digits, or combinations of either; -->
<!-- *                   alpha - must contain only letters;            -->
<!-- *                   alphanumericrequiredalpha -                    -->
<!-- *                               must contain letters and may       -->
<!-- *                               contain numbers.  Use of this      -->
<!-- *                               type will exclude validation by    -->
<!-- *                               by values or by pattern             -->
<!-- *
<!-- *           <minValue>       int containing minimum numeric value of token -->
<!-- *                   (optional)                                     -->
<!-- *
<!-- *           <maxValue>       int containing maximum numeric value of -->
<!-- *                   token (optional)                               -->
<!-- *
<!-- *           <validRanges>    list of ranges considered valid for the -->
<!-- *                   token; part of type based processing (optional) -->
<!-- *                   Example: <validRanges>0-2,4-5</validRanges>    -->
<!-- *
<!-- *           <invalidRanges> list of ranges considered invalid for the -->
<!-- *                   token; part of type based processing (optional) -->
<!-- *
<!-- *           <zeroPadding>    determines how to enforce 0 padding within a -->
<!-- *                   numeric value (optional).                      -->
<!-- *
<!-- *                   allow - allow 0 padding in the number, but do -->
<!-- *                               not force it.  Essentially a "don't -->
<!-- *                               care." This is the default.         -->
<!-- *                   disallow - prevents numbers from starting with a -->
<!-- *                               0.                                   -->
<!-- *                   force - require numbers to be left-padded with -->
<!-- *                               0s.  The pad size is dependent on the -->
<!-- *                               number of digits in the specified -->
<!-- *                               <maxValue>.  If max value is not    -->
<!-- *                               provided, then this option is treated -->
<!-- *                               as "allow".                          -->
<!-- *
<!-- *           <case>           the case for the token;                -->
<!-- *                   e.g., upper, lower, mixed (default) (optional) -->
<!-- *
<!-- *           <minLength>      minimum length (optional)              -->
<!-- *
<!-- *           <maxLength>      maximum length (optional)              -->
<!-- *
<!-- *           <template>       template showing how token should look; -->
<!-- *                   No validation is performed against the         -->

```

```

<!-- *                                template. It is used only for error reporting    -->
<!-- *                                -->
<!-- *    <values>                    list of valid string values; Use of the          -->
<!-- *                                values property will exclude validation of      -->
<!-- *                                the token by type or by pattern (optional)       -->
<!-- *                                -->
<!-- *    <pattern>                  can be used to define a tokens properties,      -->
<!-- *                                including delimiters, number of alpha/numeric    -->
<!-- *                                characters, etc. Refer to the Pattern class      -->
<!-- *                                in the JavaDocs for more info on its use;       -->
<!-- *                                Use of the pattern property will result in      -->
<!-- *                                pattern checking ONLY. Individual token        -->
<!-- *                                checking by type or by values will not be      -->
<!-- *                                performed (optional)                          -->
<!-- ***** -->
</xsd:schema>

```

### 3.9.1.3 Directories Used for Certificates and Schemas

Placing a certificate in the Third Party directory listed below is how a profile is imported into the CMT software. Every 5 minutes, a polling cycle starts and scans these directories for changes. If a new file is found, its contents are verified for correctness and if verification passes, the profile is imported into the system. In addition, profiles can be removed from the system by removing certificates from this directory. Error conditions such as malformed certificates are reported as alarms. For more information on error conditions, refer to the “FM” document which accompanies this documentation.

The Nortel Certificates directory is auto datafilled by profiles that are included in customer delivered software. Users should never put a certificate directly in this directory. Nortel/Interop personnel should use the Third Party directory while working with the certificate file until a production version is ready. For updates or additions to Nortel certificates directory, Clear Case modifications are required. Appropriate Nortel personnel should be contacted for detailed information concerning building the final version of a newly defined certificate into customer deliverable software.

#### 3.9.1.3.1 Certificate Directories

The directories listed below hold the certificate files (XML documents) The Third Party directory is polled every 5 minutes for changes:

- /opt/nortel/NTsesm/properties/certificates/NortelCertificates
- /opt/nortel/NTsesm/properties/certificates/ThirdPartyCertificates

The following list shows certificates that are available in the /opt/nortel/NTsesm/properties/certificates/ThirdPartyCertificates as of the SN08 release. When building new certificates, these files can be used as a reference for understanding profile attributes.

**Figure 53 SN08 Nortel Defined Certificates in the NortelCertificates Directories**

#### 3.9.1.4 Schema Directories

The following directory holds the schema files that are used as the template to define certificates. Three files are made available. The base “certificate” file defines the fields that define a certificate. The certificateTypes file holds the data values that should be used for the majority of the fields. And the nameFormats file which holds the Endpoint and Gateway naming conventions which should be used for these fields.

- /opt/nortel/NTsesm/xsd/namesif

### 3.9.2 Changed OSSGate Commands

In SN08, each Profile is defined with a unique Protocol and no longer supports multiple Protocols. With this change, the Change GW command has been updated to remove the Change Protocol command and now supports Change Profile only. Other restrictions may apply.

#### 3.9.2.1 Change MG Schema

The following text lists the schema definition for the Change GW Profile

command. This existing command has been updated to include a new “choice” of “mgProfile”. Because the field is defined within the choice block, the user must choose between changing the Reserved Terminations, IP information, or newly added Profile and is not allowed to change multiple attributes at the same time.

```
<!-- ***** -->
<!-- * Define changeMG Method Parameters -->
<!-- ***** -->
<xsd:complexType name="changeMGMethodType">
<xsd:all>
<xsd:element name="Parameters" type="changeMGParamsType" />
</xsd:all>
<xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="changeMGParamsType">
<xsd:sequence>
<xsd:sequence>
<xsd:element name="mgUIName" type="NoSpaceNameType" />
</xsd:sequence>
<xsd:choice >
<xsd:element name="reservedTerminations" type="ReservedTerminationsType" />
<xsd:element name="mgProfile" type="NoSpaceNameType" />
</xsd:sequence>
<xsd:element name="mgIpAddr" type="IPAddressType" minOccurs="0" />
<xsd:element name="mgProtocolPort" type="IpPortType" minOccurs="0" />
</xsd:sequence>
</xsd:choice>
</xsd:sequence>
</xsd:complexType>
</xsd:schema>
```

### 3.9.2.2 Change MG Document

The following XML document definition shows a GW that is being changed to the “ARRIS\_TOUCHTONE\_NN03\_4” profile definition. In order for this command to work, this profile must have been previously defined and imported into the CMT software.

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
<Command>
<Interface>cs2kCfgMgrIf</Interface>
<Methods>
<changeMG usn="1" version="1.0" >
<Parameters>
<mgUIName>MG1</mgUIName>
<mgProfile>ARRIS_TOUCHTONE_NN03_4</mgProfile>
</Parameters>
</changeMG>
</Methods>
</Command>
</CommandList>
```

### 3.9.3 New OSSGate Commands

This activity introduces two new commands that can be issued via the OSSGate interface. These commands allow users to retrieve information that is associated with profiles.

### 3.9.3.1 Get Certificate List

The `getCertificateList` command is a newly introduced XML command for the SN08 release. Unlike the GUI interface, which provides a pull down menu of defined profiles, the user must know the specific name of a profile in order to associate a GW to the system. This command is included as a means to retrieve profiles that have been imported into CMT software. Valid profile names are returned in a list and can be used with the `associate GW` command.

### 3.9.3.2 Get Certificate List Schema

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

  <xsd:include schemaLocation="../certificateossif/certificatecommon.xsd" />

  <!-- ***** _
-->
  <!-- * Define GWCCConfiguration getCertificateList Method Parameters -->
  <!-- ***** _
-->
  <xsd:complexType name="getCertificateDataMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="getCertificateDataType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>

  <xsd:complexType name="getCertificateDataType">
    <xsd:sequence>
      <xsd:element name="CertificateName" type="NoSpaceNameType" />
    </xsd:sequence>
  </xsd:complexType>

</xsd:schema>
```

#### 3.9.3.2.1 Get Certificate List Document

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList >
  <Command>
    <Interface>CertificateOSSIf</Interface>
    <Methods>
      <getCertificateList usn="1" version="1.0">
        <Parameters>
          </Parameters>
        </getCertificateList>
      </Methods>
    </Command>
  </CommandList>
```

### 3.9.3.3 Get Certificate List Result Set

The `Get Certificate List` command returns a list of profile names that can be used to provision a GW using the `associate GW OSSGate` command.

```
<?xml version='1.0'?>
<CommandList>
```

```

<Response>
  <Interface>CertificateOSSIf</Interface>
  <Methods>
    <getCertificateList usn="1" version="1.0"><ReturnCode value="13.0"
text="Successful result" /><certificate>ARRIS_TOUCHTONE_NN01_4</certificate>
<certificate>ARRIS_TOUCHTONE_NN02_4</certificate>
<certificate>ASKEY_LINE_GW_12</certificate>
<certificate>ASKEY_LINE_GW_30</certificate>
<certificate>ASKEY_LINE_GW_4</certificate>
<certificate>AUDIOCODES</certificate><certificate>CICM</certificate>
<certificate>CISCO_2600</certificate><certificate>CISCO_3600</certificate>
<certificate>CISCO_AS5300</certificate><certificate>CISCO_H323_IOS</certificate>
<certificate>CVX1800_2688</certificate><certificate>CVX600_612</certificate>
<certificate>DOMAIN_NAME</certificate><certificate>H323_PROXY</certificate>
<certificate>MEDIATRIX_LINE_GW_24</certificate>
<certificate>MEDIATRIX_LINE_GW_4</certificate>
<certificate>MGCP_LINE_GW_1</certificate>
<certificate>MOTOROLAMTA_1</certificate>
<certificate>MOTOROLAMTA_2</certificate>
<certificate>MOTOROLAMTA_4</certificate>
<certificate>NORTEL_BCM</certificate>
<certificate>NUERA_GX_ASPEN</certificate>
<certificate>NUERA_GX_MEGACO</certificate>
<certificate>PVG15K_1000_ASPEN</certificate>
<certificate>PVG15K_1000_MEGACO</certificate>
<certificate>PVG15K_ASPEN</certificate>
<certificate>PVG15K_MEGACO</certificate>
<certificate>PVG15K_PARTIAL_ASPEN</certificate><certificate>AFC</certificate>
<certificate>PVG15K_PARTIAL_MEGACO</certificate>
<certificate>AMBIT_LINE_GW_16</certificate>
<certificate>PVG7K_ASPEN</certificate>
<certificate>PVG7K_MEGACO</certificate>
<certificate>PVG_APG_ASPEN</certificate>
<certificate>PVG_APG_MEGACO</certificate>
<certificate>PVG_APG_VSP3_ASPEN</certificate>
<certificate>PVG_APG_VSP3_MEGACO</certificate>
<certificate>PVG_VSP3_ASPEN</certificate>
<certificate>PVG_VSP3_MEGACO</certificate>
<certificate>SN06_CICM</certificate><certificate>SUCCESSION_1000</certificate>
<certificate>TGCP</certificate><certificate>TOUCHTONE_NN01_1</certificate>
<certificate>TOUCHTONE_NN01_2</certificate>
<certificate>TOUCHTONE_NN01_3</certificate>
<certificate>TOUCHTONE_NN01_4</certificate><certificate>UAS</certificate>
<certificate>UE9000MG</certificate><certificate>UE9000MG_ABI</certificate>
<certificate>UE9000MG_ABI_IP</certificate>
<certificate>UE9000MG_IP</certificate><certificate>WESTELL</certificate>
</Methods>
</Response>
</CommandList>

```

### 3.9.3.4 Get Certificate Data OSSGate Command

In addition to the list of profiles, this activity introduces the ability to list the Certificate that was used to generate a profile. This Certificate can be used to understand datafill options when creating a new GW.

#### 3.9.3.4.1 Get Certificate Data Schema

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
version="1.0"
xml:lang="en" >

```



```

<xsd:include schemaLocation="../certificateossif/certificatecommon.xsd" />

<!--
*****
-->
<!-- * Define GWCCConfiguration getCertificateData Method Parameters -->
<!--
*****
-->

<xsd:complexType name="getCertificateListMethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="getCertificateListType" minOccurs="0" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>

<xsd:complexType name="getCertificateListType">
  <xsd:sequence>
    <xsd:element name="List" type="xsd:string" minOccurs="0" />
  </xsd:sequence>
</xsd:complexType>

</xsd:schema>

```

### 3.9.3.4.2 Get Certificate Data Document

```

<?xml version="1.0" encoding="UTF-8" ?>
<CommandList >
  <Command>
    <Interface>CertificateOSSIf</Interface>
    <Methods>
      <getCertificateData usn="1" version="1.0">
        <Parameters>
          <CertificateName>CISCO_2600</CertificateName>
        </Parameters>
      </getCertificateData>
    </Methods>
  </Command>
</CommandList>

```

### 3.9.3.5 Get Certificate Data Result Set

The Get Certificate Data command returns the Certificate used to generate a profile.

```

<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>CertificateOSSIf</Interface>
    <Methods>
      <getCertificateData usn="1" version="1.0"><ReturnCode value="13.0" text="Successful
result" /><certificate> <MaxEndpoints>4094</MaxEndpoints>
      <Category>LARGE</Category>
      <EndpointType>nocarrierTrkGwcNN</EndpointType>
      <GenerateLGRP>true</GenerateLGRP>
    </Methods>
  </Response>
</CommandList>

```

```

<ResvTermMandatory>true</ResvTermMandatory>
<ChangeIPAvailable>true</ChangeIPAvailable>
<DispPhyLocation>false</DispPhyLocation>
<InventoryType>H.323 Gateway</InventoryType>
<InventoryRole>Media Gateway</InventoryRole>
<SupportedProtocol>
  <protocolName>h323</protocolName>
  <version>4.0</version>
</SupportedProtocol>
<GWCPProfileNumber>63</GWCPProfileNumber>
<EPIDGenDesc>auto1</EPIDGenDesc>
<ServiceTypeList>H323</ServiceTypeList>
<ServiceTypeList>ITRANS</ServiceTypeList>
<CompatibleGWProfileList>CISCO_2600</CompatibleGWProfileList>

<GatewayNameFormatList>
  <nameFormat formatKey="GATEWAY.H323" enabled="true" applyToPattern=".*">
    <name>H323 Gateway</name>
    <delimiters>`</delimiters>
    <maxTokens>1</maxTokens>
    <tokenFormats>
      <tokenFormat tokenKey="GW">
        <name>Name</name>
        <pattern><![CDATA[[^"'<=>]*]]></pattern>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
  <nameFormat formatKey="GATEWAY.ALL" enabled="true" applyToPattern=".*">
    <name>Generic For All Gateways</name>
    <template>gatewayName</template>
    <maxLength>32</maxLength>
    <minLength>1</minLength>
    <delimiters>none</delimiters>
    <tokenFormats>
      <tokenFormat tokenKey="GW">
        <pattern><![CDATA[[^"'<=>,*]]></pattern>
        <name>Name</name>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
</GatewayNameFormatList>

<EndpointNameFormatList>
  <nameFormat formatKey="CARRIER.H323.EPG" enabled="true" applyToPattern=".*">
    <name>EPG</name>
    <template><![CDATA[EPG_<nnn>]]></template>
    <maxTokens>2</maxTokens>
    <minTokens>2</minTokens>
    <delimiters>_</delimiters>
    <maxLength>7</maxLength>
    <minLength>7</minLength>
    <appDataList>
      <appData name="CARRIERTYPEORPROTOCOLALLOWED" value="H323"
type="NONE" />
      <appData name="CAPACITYDEFAULT" value="32" type="INTL" />
      <appData name="CAPACITYDEFAULT" value="24" type="NA" />
    </appDataList>
    <tokenFormats>
      <tokenFormat tokenKey="TYPE">
        <name>Type</name>
        <template>EPG</template>

```

```

    <type>alphanumeric</type>
    <values>EPG</values>
  </tokenFormat>
  <tokenFormat tokenKey="NUMBER">
    <min Value>0</min Value>
    <max Value>999</max Value>
    <name>Number</name>
    <type>numeric</type>
    <template><![CDATA[<nnn>]]></template>
  </tokenFormat>
</tokenFormats>
</nameFormat>
</EndpointNameFormatList>

</certificate></getCertificateData>  </Methods>
</Response>
</CommandList>

```

## 3.10 Security

N/A

## 3.11 Configuration Walkthrough

### 3.11.1 Certificate Creation

A certificate is created with the goal of creating a new profile. The following procedure should be used:

1. Understand schema field values by reading field descriptions in this document. Also, existing certificates listed in the appendix of this document and also available in the Nortel certificate directory, give examples of how the certificate fields are being used for other profiles.
2. Use a plain vanilla editor (i.e., UNIX vi) that will not put hidden formatting characters into the file. Or, using any editor, save the file as “text” making sure that hidden characters such as ^Ms are not put in document.
3. Create a XML document (a Certificate) with the desired behaviors of the new profile making sure to name the file with the “.certificate” extension.

**Note:** Certificate names are case insensitive. The convention is to use uppercase when creating Certificates, however, mixed case name are recognized. Mixed case names are converted to upper case when imported into the system.

**Note:** Duplicate Certificate names are not allowed and do not consider case. In other words, XYZ.certificate and xyz.certificate are regarded by software as the same name and would cause a duplicate alarm. This restriction applies to both the Nortel and Third Party directories and spans both directories. For example, if the XYZ.certificate is present in the

Nortel directory and also in the Third Party directory a duplicate alarm would be raised.

### 3.11.2 Importing a Profile into the System

In order to use a newly created certificate, the certificate must be imported into the CMT system. System importation is an automatic process as listed below.

**Note:** Only 3rd Party Interopt certificates are imported into CMT software. Nortel Defined certificates are included in the software that is delivered in the released product.

1. Put the certificate created from the process listed above in the following directory:  
/opt/nortel/NTsesm/properties/certificate/ThirdPartyCertificates
2. A polling cycle occurs every 5 minutes and automatically reads in any new certificates placed in this directory.
3. If a problem is encountered with the certificate, an alarm is raised. In order to clear the alarm, the contents of the certificate should be altered as listed in the alarm, and the file should be reloaded. When the polling cycle runs again, the file is once again scanned into the system if the alarm condition is remedied.

**Note:** Details concerning the “corrupt and changed” certificate alarms are listed in the CMT minor (MNR) log files. These files can be viewed at the following location “/opt/nortel/NTsesm/admin/logs/ptmdebuglog1.mi2.

**Note:** Restricting the logs to list MNR and above logs only can be accomplished using the MI2Admin tool. This tool is located in the /opt/nortel/NTsesm/bin directory.

4. A certificate that is successfully imported into the system gives the following capabilities:
  - The profile is listed in the Associate GW GUI profile combo box
  - The profile is available as a provisioning parameter for the OSSGate Associate GW profile field

### 3.11.3 Changing the Profile Assigned to a GW

The following procedure should be used when a user wants to change the profile assigned to a GW. Note that, certificates should never be manipulated directly to change a profile. The following attributes can be changed: endpoint and gateway format, reserved terminations, mandatory reserved flag, physical location flag, service type, compatible profile, maximum endpoints, and protocol.

1. Create a new profile with the changed Administrative attributes

2. or, have an existing profile available with differences in Administrative attributes only
3. Select the GW to be changed from the Provisioning/Gateways panel and push the “change” button
4. Select the profile that the GW is to be changed to and select OK
5. or, issue the OSSGate Change GW command with the new profile

#### 3.11.4 Removing a Profile

It may be desirable for a user to remove a profile from the system. One reason for doing this is to reduce the clutter for obsolete profiles or to remove the ability to assign one of these profiles to a GW mistakenly. The following procedure should be used to accomplish this.

1. Remove all GWs that have the profile in question assigned to them
2. or, change the GWs with the profile to a different profile as listed above
3. Remove the certificate from the  
/opt/nortelNTsesm/properties/certificates/ThirdParty Directory
4. Wait up to 5 minutes for the certificate directory to be polled and the certificate is remove automatically

**Note:** If a certificate is removed that has GWs assigned to it, an alarm is raised and will not clear until all GWs with the deleted certificate are removed or the certificate is put back in the certificates directory. For more information on this topic, refer to the FM document that accompanies this documentation.

#### 3.11.5 3rd Party Certificate Distribution

A profiles certificate is a text file that can be transferred like any other file. Once a certificate has been created, distribution of the file to customers can be performed using any file transfer program such as FTP. Theoretically, the file can be recreated at the customer site, but, it is recommended that the original certificate is sent to the customer by a file transfer program to avoid inadvertent syntax errors. Important; caution should be used so that hidden or formatting characters are not introduced into Certificate files. For example, editors such as Microsoft Notepad introduce a ^M character.

### 3.12 Appendix

#### 3.12.1 Converted Profile Nortel Certificates

Following is a sample list of Nortel provided certificates that are available at creation of this document. While every attempt has been made to insure completeness and accuracy of these certificates, the content may be incomplete or obsolete. These definitions are provided here for illustration

purposes only. For the released list of certificates, please refer to /opt/nortel/NTsesm/properties/certificates/NortelCertificates directory.

### 3.12.1.1 ASCII\_LINE\_GW\_30

```
<?xml version="1.0" encoding="UTF-8" ?>

<certificate>

  <MaxEndpoints>30</MaxEndpoints>
  <Category>SMALL</Category>
  <EndpointType>managedLens</EndpointType>
  <GenerateLGRP>false</GenerateLGRP>
  <ResvTermMandatory>false</ResvTermMandatory>
  <ChangeIPAvailable>false</ChangeIPAvailable>
  <DispPhyLocation>false</DispPhyLocation>
  <InventoryType>Small Line Gateway</InventoryType>
  <InventoryRole>Media Gateway</InventoryRole>
  <SupportedProtocol>
    <protocolName>mgcp</protocolName>
    <version>1.0</version>
  </SupportedProtocol>
  <GWCPProfileNumber>49</GWCPProfileNumber>
  <EPIDGenDesc>manual</EPIDGenDesc>
  <ServiceTypeList>line</ServiceTypeList>
  <ServiceTypeList>ITRANS</ServiceTypeList>
  <CompatibleGWProfileList>ASKEY_LINE_GW_30</CompatibleGWProfileList>

  <GatewayNameFormatList>
    <nameFormat formatKey="GATEWAY.UE511" enabled="true">
      <delimiters>.</delimiters>
      <minLength>1</minLength>
      <maxLength>32</maxLength>
      <minTokens>1</minTokens>
      <maxTokens>16</maxTokens>
      <name>IAD Gateway</name>
      <template>
        <![CDATA[<name segment>[.<name segment>. ... <name segment>] up to 16 segments
(e.g. MyGate05.com, AA-BB-CC, a12345)]]>
      </template>
      <tokenFormats>
        <tokenFormat tokenKey="NAME">
          <name>Name</name>
          <template><![CDATA[<name segment - must start with letter>]]></template>
          <pattern><![CDATA[^[a-zA-Z][a-zA-Z0-9-]*]]></pattern>
        </tokenFormat>
        <tokenFormat tokenKey="DOMAIN">
          <name>Domain</name>
          <template><![CDATA[<domain>]]></template>
          <pattern><![CDATA[[a-zA-Z0-9-]*]]></pattern>
        </tokenFormat>
        <tokenFormat tokenKey="DOMAIN">
          <name>Domain</name>
          <template><![CDATA[<domain>]]></template>
          <pattern><![CDATA[[a-zA-Z0-9-]*]]></pattern>
        </tokenFormat>
        <tokenFormat tokenKey="DOMAIN">
          <name>Domain</name>
          <template><![CDATA[<domain>]]></template>
          <pattern><![CDATA[[a-zA-Z0-9-]*]]></pattern>
        </tokenFormat>
      </tokenFormats>
    </nameFormat>
  </GatewayNameFormatList>

```



```

        <pattern><![CDATA[[a-zA-Z0-9-]*]]></pattern>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
  <nameFormat formatKey="GATEWAY.ALL" enabled="true">
    <template>gatewayName</template>
    <delimiters>none</delimiters>
    <minLength>1</minLength>
    <maxLength>32</maxLength>
    <name>Generic For All Gateways</name>
    <tokenFormats>
      <tokenFormat tokenKey="GW">
        <name>Name</name>
        <pattern><![CDATA[[^"'<>=,;]*]]></pattern>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
</GatewayNameFormatList>
<EndpointNameFormatList>
  <nameFormat formatKey="LINE.SMALL">
    <maxTokens>2</maxTokens>
    <template><![CDATA[aaln<nnnn>]]></template>
    <delimiters>/</delimiters>
    <minLength>6</minLength>
    <minTokens>2</minTokens>
    <name>Small Line</name>
    <enabled>true</enabled>
    <maxLength>9</maxLength>
    <tokenFormats>
      <tokenFormat tokenKey="PREFIX">
        <name>Prefix</name>
        <values>aaln</values>
        <template>aaln</template>
        <maxLength>4</maxLength>
        <minLength>4</minLength>
        <type>alphanumeric</type>
      </tokenFormat>
      <tokenFormat tokenKey="LINENUM">
        <maxValue>4095</maxValue>
        <name>Line Number</name>
        <type>numeric</type>
        <template><![CDATA[<nnnn>]]></template>
        <minValue>0</minValue>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
</EndpointNameFormatList>
</certificate>

```

### 3.12.1.2 CISCO\_2600

```

<?xml version="1.0" encoding="UTF-8" ?>
<certificate>
  <MaxEndpoints>1032</MaxEndpoints>

```



```

<Category>LARGE</Category>
<EndpointType>nocarrierTrkGwcNN</EndpointType>
<GenerateLGRP>true</GenerateLGRP>
<ResvTermMandatory>true</ResvTermMandatory>
<ChangeIPAvailable>true</ChangeIPAvailable>
<DispPhyLocation>false</DispPhyLocation>
<InventoryType>H.323 Gateway</InventoryType>
<InventoryRole>Media Gateway</InventoryRole>
<SupportedProtocol>
  <protocolName>h323</protocolName>
  <version>4.0</version>
</SupportedProtocol>
<GWCPProfileNumber>63</GWCPProfileNumber>
<EPIDGenDesc>auto1</EPIDGenDesc>
<ServiceTypeList>H323</ServiceTypeList>
<ServiceTypeList>ITRANS</ServiceTypeList>
<CompatibleGWProfileList>CISCO_2600</CompatibleGWProfileList>

<GatewayNameFormatList>
  <nameFormat formatKey="GATEWAY.H323" enabled="true">
    <delimiters>`</delimiters>
    <maxTokens>1</maxTokens>
    <name>H323 Gateway</name>
    <tokenFormats>
      <tokenFormat tokenKey="GW">
        <pattern><![CDATA[[^"'<>=]* ]]></pattern>
        <name>Name</name>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
  <nameFormat formatKey="GATEWAY.ALL" enabled="true">
    <template>gatewayName</template>
    <delimiters>none</delimiters>
    <minLength>1</minLength>
    <maxLength>32</maxLength>
    <name>Generic For All Gateways</name>
    <tokenFormats>
      <tokenFormat tokenKey="GW">
        <name>Name</name>
        <pattern><![CDATA[[^"'<>=,;]*]></pattern>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
</GatewayNameFormatList>

<EndpointNameFormatList>
<nameFormat formatKey="CARRIER.H323.EPG">
  <appDataList>
    <appData name="CapacityDefault" value="24" type="NA" />
    <appData name="CapacityDefault" value="32" type="INTL" />
    <appData name="CarrierTypeOrProtocolAllowed" value="H323" />
  </appDataList>
  <template><![CDATA[EPG_<nnn>]]></template>
  <name>EPG</name>
  <maxLength>7</maxLength>
  <minLength>7</minLength>
  <maxTokens>2</maxTokens>
  <enabled>true</enabled>
  <minTokens>2</minTokens>
  <delimiters>_</delimiters>
  <tokenFormats>

```

```

    <tokenFormat tokenKey="TYPE">
      <values>EPG</values>
      <name>Type</name>
      <type>alphanumeric</type>
      <template>EPG</template>
    </tokenFormat>
    <tokenFormat tokenKey="NUMBER">
      <max Value>999</max Value>
      <name>Number</name>
      <type>numeric</type>
      <template><![CDATA[<nnn>]]></template>
      <min Value>0</min Value>
    </tokenFormat>
  </tokenFormats>
</nameFormat>
</EndpointNameFormatList>

</certificate>

```

### 3.12.1.3 PVG\_APG\_ASPEN

```

<?xml version="1.0" encoding="UTF-8" ?>

<certificate>

  <MaxEndpoints>1120</MaxEndpoints>
  <Category>APG</Category>
  <EndpointType>carrierTrksGwcNN</EndpointType>
  <GenerateLGRP>false</GenerateLGRP>
  <ResvTermMandatory>false</ResvTermMandatory>
  <ChangeIPAvailable>false</ChangeIPAvailable>
  <DispPhyLocation>false</DispPhyLocation>
  <InventoryType>Large Trunk Gateway</InventoryType>
  <InventoryRole>Media Gateway</InventoryRole>
  <SupportedProtocol>
    <protocolName>aspen</protocolName>
    <version>2.1</version>
  </SupportedProtocol>
  <GWCPProfileNumber>46</GWCPProfileNumber>
  <EPIDGenDesc>auto1</EPIDGenDesc>
  <ServiceTypeList>APG</ServiceTypeList>
  <CompatibleGWProfileList>PVG_APG_ASPEN</CompatibleGWProfileList>

  <GatewayNameFormatList>
    <nameFormat formatKey="GATEWAY.PVG">
      <name>PVG Gateway</name>
      <delimiters>none</delimiters>
      <enabled>true</enabled>
      <maxTokens>1</maxTokens>
      <tokenFormats>
        <tokenFormat tokenKey="GW">
          <name>Pvg</name>
          <case>upper</case>
          <type>alphanumeric</type>
        </tokenFormat>
      </tokenFormats>
    </nameFormat>
  </GatewayNameFormatList>

```

```

</nameFormat>
<nameFormat formatKey="GATEWAY.ALL">
  <template>gatewayName</template>
  <delimiters>none</delimiters>
  <name>Generic For All Gateways</name>
  <enabled>true</enabled>
  <tokenFormats>
    <tokenFormat tokenKey="GW">
      <name>Name</name>
      <pattern><![CDATA[[^"'\<>=,;]*]]></pattern>
    </tokenFormat>
  </tokenFormats>
</nameFormat>
</GatewayNameFormatList>

<EndpointNameFormatList>
<nameFormat formatKey="CARRIER.ASPEN.DS1" applyToPattern="^DS1.*">
  <appDataList>
    <appData name="CapacityDefault" value="24" type="*" />
    <appData name="CarrierTypeOrProtocolAllowed" value="ISUP" />
    <appData name="CarrierTypeOrProtocolAllowed" value="PRI" />
  </appDataList>
  <maxLength>6</maxLength>
  <template><![CDATA[DS1_<nn>]]></template>
  <minLength>5</minLength>
  <maxTokens>2</maxTokens>
  <delimiters>_</delimiters>
  <name>DS1</name>
  <minTokens>2</minTokens>
  <enabled>true</enabled>
  <tokenFormats>
    <tokenFormat tokenKey="TYPE">
      <name>Type</name>
      <type>alphanumeric</type>
      <values>DS1</values>
      <template>DS1</template>
    </tokenFormat>
    <tokenFormat tokenKey="NUMBER">
      <template><![CDATA[<nn>]]></template>
      <minValue>0</minValue>
      <maxValue>99</maxValue>
      <name>Number</name>
      <type>numeric</type>
    </tokenFormat>
  </tokenFormats>
</nameFormat>
<nameFormat formatKey="CARRIER.ASPEN.DS3" applyToPattern="^DS3.*">
  <appDataList>
    <appData name="CapacityDefault" value="24" type="*" />
    <appData name="CarrierTypeOrProtocolAllowed" value="ISUP" />
    <appData name="CarrierTypeOrProtocolAllowed" value="PRI" />
  </appDataList>
  <delimiters>_</delimiters>
  <name>DS3</name>
  <template><![CDATA[DS3_<nnn>.<dd>]]></template>
  <maxLength>10</maxLength>
  <minLength>7</minLength>
  <enabled>true</enabled>
  <maxTokens>3</maxTokens>
  <minTokens>3</minTokens>
  <tokenFormats>

```

```

    <tokenFormat tokenKey="TYPE">
      <values>DS3</values>
      <name>Type</name>
      <type>alphanumeric</type>
      <template>DS3</template>
    </tokenFormat>
    <tokenFormat tokenKey="LPSLOT">
      <template><![CDATA[<nnn>]]></template>
      <minValue>0</minValue>
      <maxValue>999</maxValue>
      <name>LP Slot and Port</name>
      <type>numeric</type>
    </tokenFormat>
    <tokenFormat tokenKey="DS1NUMBER">
      <minValue>0</minValue>
      <maxValue>99</maxValue>
      <name>DS1 Number</name>
      <type>numeric</type>
      <template><![CDATA[<dd>]]></template>
    </tokenFormat>
  </tokenFormats>
</nameFormat>
<nameFormat formatKey="CARRIER.ASPEN.E1" applyToPattern="^E1.*">
  <appDataList>
    <appData name="CapacityDefault" value="31" type="*" />
    <appData name="CarrierTypeOrProtocolAllowed" value="*" />
  </appDataList>
  <name>E1</name>
  <delimiters>_</delimiters>
  <enabled>true</enabled>
  <maxLength>7</maxLength>
  <minLength>6</minLength>
  <maxTokens>2</maxTokens>
  <template><![CDATA[E1_<nnnn>]]></template>
  <minTokens>2</minTokens>
  <tokenFormats>
    <tokenFormat tokenKey="TYPE">
      <type>alphanumeric</type>
      <values>E1</values>
      <template>E1</template>
      <name>Type</name>
    </tokenFormat>
    <tokenFormat tokenKey="LPE1">
      <zeroPadding>disallow</zeroPadding>
      <template><![CDATA[<nnnn>]]></template>
      <name>LP Slot and E1 Number</name>
      <type>numeric</type>
      <minValue>0</minValue>
      <maxValue>9999</maxValue>
    </tokenFormat>
  </tokenFormats>
</nameFormat>
<nameFormat formatKey="CARRIER.ASPEN.STM" applyToPattern="^SM_.*_412_.*">
  <appDataList>
    <appData name="CapacityDefault" value="31" type="*" />
    <appData name="CarrierTypeOrProtocolAllowed" value="ISUP" />
    <appData name="CarrierTypeOrProtocolAllowed" value="PRI" />
  </appDataList>
  <maxLength>18</maxLength>
  <maxTokens>4</maxTokens>
  <template><![CDATA[SM_<lp><pp><r>_412_<aa><t><u><v>]]></template>

```

```

<minLength>17</minLength>
<minTokens>4</minTokens>
<name>STM</name>
<delimiters>_</delimiters>
<enabled>true</enabled>
<tokenFormats>
  <tokenFormat tokenKey="TYPE">
    <template>SM</template>
    <name>Type</name>
    <type>alphanumeric</type>
    <values>SM</values>
  </tokenFormat>
  <tokenFormat tokenKey="LPPORT">
    <name>LP / Port / Level</name>
    <type>numeric</type>
    <template><![CDATA[<lp><pp><r>]]></template>
    <min Value>1000</min Value>
    <max Value>15999</max Value>
  </tokenFormat>
  <tokenFormat tokenKey="MUX">
    <template>412</template>
    <name>Mux Type VC4VC12</name>
    <values>412</values>
    <type>alphanumeric</type>
  </tokenFormat>
  <tokenFormat tokenKey="AUGTUG">
    <template><![CDATA[<aa><t><u><v>]]></template>
    <min Value>1000</min Value>
    <max Value>99999</max Value>
    <name>AUG / VC4-TUG3 / TUG2-TUG3 / TU</name>
    <type>numeric</type>
  </tokenFormat>
</tokenFormats>
</nameFormat>
<nameFormat formatKey="CARRIER.ASPEN.STS" applyToPattern="^SS_.*_VT15_.*">
  <appDataList>
    <appData name="CapacityDefault" value="24" type="*" />
    <appData name="CarrierTypeOrProtocolAllowed" value="ISUP" />
    <appData name="CarrierTypeOrProtocolAllowed" value="PRI" />
  </appDataList>
  <name>SS</name>
  <maxTokens>4</maxTokens>
  <minLength>17</minLength>
  <minTokens>4</minTokens>
  <enabled>true</enabled>
  <template><![CDATA[SS_<lp><pp><r>_VT15_<ss><t><v>]]></template>
  <maxLength>18</maxLength>
  <delimiters>_</delimiters>
  <tokenFormats>
    <tokenFormat tokenKey="TYPE">
      <name>Type</name>
      <template>SS</template>
      <type>alphanumeric</type>
      <values>SS</values>
    </tokenFormat>
    <tokenFormat tokenKey="LPPORT">
      <max Value>15999</max Value>
      <name>LP / Port / Level</name>
      <type>numeric</type>
      <template><![CDATA[<lp><pp><r>]]></template>
      <min Value>1000</min Value>
    </tokenFormat>
  </tokenFormats>
</nameFormat>

```

```

</tokenFormat>
<tokenFormat tokenKey="MUX">
  <template>VT15</template>
  <values>VT15</values>
  <name>Mux Type VT15</name>
  <type>alphanumeric</type>
</tokenFormat>
<tokenFormat tokenKey="TUG">
  <name>STS-1 / TUG3 / VT</name>
  <type>numeric</type>
  <template><![CDATA[<ss><t><v>]]></template>
  <maxValue>9999</maxValue>
  <minValue>100</minValue>
</tokenFormat>
</tokenFormats>
</nameFormat>
<nameFormat formatKey="CARRIER.ASPEN.ALL">
  <name>Generic Name Check for APSEN Protocol</name>
  <delimiters>none</delimiters>
  <enabled>true</enabled>
<tokenFormats>
  <tokenFormat tokenKey="NAMEPREFIX">
    <template>DS1 or DS3 or E1 or SM or SS</template>
    <name>Generic Name Prefix</name>
    <pattern>^DS1.*|^DS3.*|^E1.*|^SM.*|^SS.*</pattern>
  </tokenFormat>
</tokenFormats>
</nameFormat>
</EndpointNameFormatList>

</certificate>

```

### 3.12.1.4 UE9000MG

```

<?xml version="1.0" encoding="UTF-8" ?>

<certificate>

  <MaxEndpoints>512</MaxEndpoints>
  <Category>LARGE</Category>
  <EndpointType>ue9000Lens</EndpointType>
  <GenerateLGRP>true</GenerateLGRP>
  <ResvTermMandatory>false</ResvTermMandatory>
  <ChangeIPAvailable>false</ChangeIPAvailable>
  <DispPhyLocation>false</DispPhyLocation>
  <InventoryType>UE9000MG</InventoryType>
  <InventoryRole>Media Gateway</InventoryRole>
  <SupportedProtocol>
    <protocolName>megaco</protocolName>
    <version>1.0</version>
  </SupportedProtocol>
  <GWCPProfileNumber>50</GWCPProfileNumber>
  <EPIDGenDesc>auto6</EPIDGenDesc>
  <ServiceTypeList>line</ServiceTypeList>
  <CompatibleGWProfileList>UE9000MG</CompatibleGWProfileList>
  <BearerFabricList>AAL1</BearerFabricList>

```

```

<GatewayNameFormatList>
  <nameFormat formatKey="GATEWAY.UE9000MG">
    <minLength>8</minLength>
    <enabled>true</enabled>
    <maxTokens>3</maxTokens>
    <name>UE9000MG Gateway</name>
    <minTokens>3</minTokens>
    <delimiters>-</delimiters>
    <template>
      <![CDATA[<sitename=1-4char+officeframe=000-511>-<logicalframe=0-7>-<shelf=0-
3>]]>
    </template>
    <maxLength>11</maxLength>
    <tokenFormats>
      <tokenFormat tokenKey="SITEOFFICEFRAME">
        <type>alphanumeric</type>
        <template><![CDATA[<sitename=1-4char+officeframe=000-511>]]></template>
        <maxLength>7</maxLength>
        <minLength>4</minLength>
        <name>Site Name / Office Frame Number</name>
      </tokenFormat>
      <tokenFormat tokenKey="LOGICALFRAME">
        <name>Logical Frame Number</name>
        <template><![CDATA[<logicalframe=0-7>]]></template>
        <maxValue>7</maxValue>
        <type>numeric</type>
        <minValue>0</minValue>
      </tokenFormat>
      <tokenFormat tokenKey="SHELF">
        <template><![CDATA[<shelf=0-3>]]></template>
        <name>Shelf Number</name>
        <minValue>0</minValue>
        <maxValue>3</maxValue>
        <type>numeric</type>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
  <nameFormat formatKey="GATEWAY.ALL">
    <template>gatewayName</template>
    <delimiters>none</delimiters>
    <name>Generic For All Gateways</name>
    <enabled>true</enabled>
    <tokenFormats>
      <tokenFormat tokenKey="GW">
        <name>Name</name>
        <pattern><![CDATA[[^"'<>=,;]*]]></pattern>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
</GatewayNameFormatList>

<EndpointNameFormatList>
  <nameFormat formatKey="LINE.UE9000MG" applyToPattern="^tp/.*/.*">
    <enabled>true</enabled>
    <template>
      <![CDATA[tp/<slot=02-21,0-padded>/<circuit=00-31,0-padded>]]>
    </template>
    <delimiters>/</delimiters>
    <maxLength>8</maxLength>
    <name>UE9000MG Line</name>
    <minLength>8</minLength>

```

```

    <maxTokens>3</maxTokens>
    <minTokens>3</minTokens>
    <tokenFormats>
      <tokenFormat tokenKey="PREFIX">
        <name>Prefix</name>
        <template>tp</template>
        <type>alphanumeric</type>
        <values>tp</values>
      </tokenFormat>
      <tokenFormat tokenKey="SLOT">
        <type>numeric</type>
        <template><![CDATA[<slot=02-21,0-padded>]]></template>
        <minValue>2</minValue>
        <maxValue>21</maxValue>
        <name>Slot Number</name>
      </tokenFormat>
      <tokenFormat tokenKey="CIRCUIT">
        <maxValue>31</maxValue>
        <name>Circuit Number</name>
        <type>numeric</type>
        <template><![CDATA[<circuit=00-31,0-padded>]]></template>
        <minValue>0</minValue>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
  <nameFormat formatKey="LINEGROUP.UE9000MG" enabled="true"
  applyToPattern="^tp\d*$">
    <maxLength>5</maxLength>
    <minLength>5</minLength>
    <maxTokens>2</maxTokens>
    <delimiters>/</delimiters>
    <minTokens>2</minTokens>
    <name>UE9000MG Line</name>
    <template>
      <![CDATA[tp/<slot=02-21,0-padded>]]>
    </template>
    <tokenFormats>
      <tokenFormat tokenKey="PREFIX">
        <values>tp</values>
        <template>tp</template>
        <name>Prefix</name>
        <type>alpha</type>
      </tokenFormat>
      <tokenFormat tokenKey="SLOT">
        <maxValue>21</maxValue>
        <name>Slot Number</name>
        <type>numeric</type>
        <template><![CDATA[<slot=02-21,0-padded>]]></template>
        <minValue>2</minValue>
      </tokenFormat>
    </tokenFormats>
  </nameFormat>
  <nameFormat formatKey="UE9000MG.ALL">
    <delimiters>none</delimiters>
    <name>Generic Name Check for UE9000MG</name>
    <enabled>true</enabled>
    <pattern>^tp/.*/.*!^tp\d*$</pattern>
    <template>
      <![CDATA[tp/<slot=02-21,0-padded> OR tp/<slot=02-21,0-padded>/<circuit=00-31,0-
      padded>]]>
    </template>
  </nameFormat>

```



```
</nameFormat>  
</EndpointNameFormatList>  
  
</certificate>
```

***Product = CS 2000***

## **A00007120--Packet Media Anchor for DPT**

### ***Functional Description***

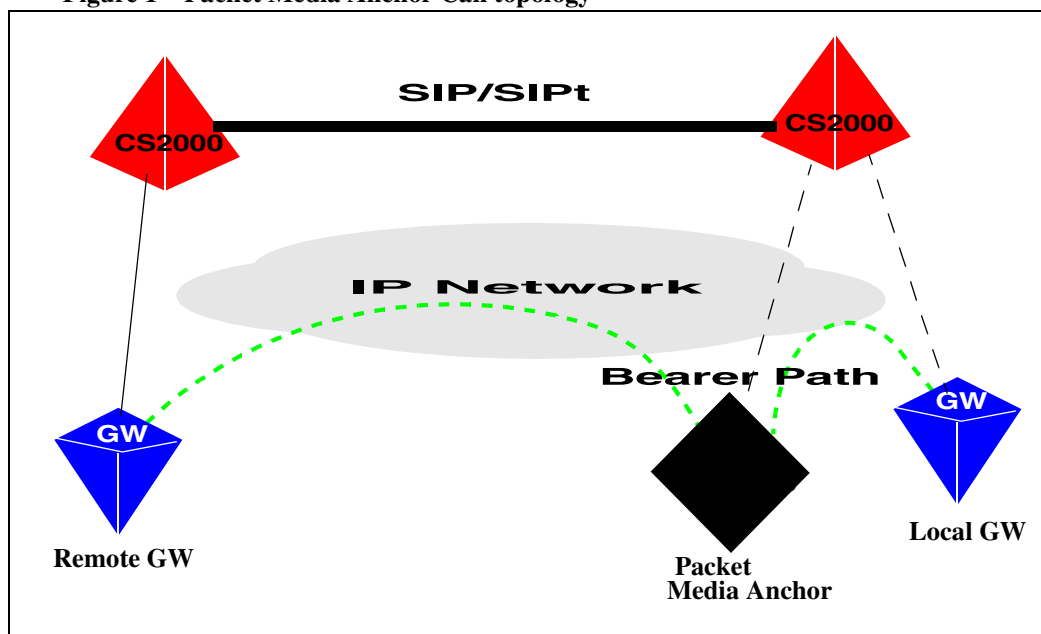
### **1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

### **1.2 Description**

This activity introduces the Packet Media Anchor for the Dynamic Packet Trunking SIP/SIPt application. The role of the Media Anchor is to provide tone, digit collection and bearer path anchoring capabilities for SIP/SIPt call types.

**Figure 1 Packet Media Anchor Call topology**



The Audiocodes 2010 has been chosen as the packet gateway to supply media anchoring functionality. The Packet Media Anchor solution uses the bearer

channel tandeming (BCT) capability of the AMS to provide media stream anchoring functionality. The media anchor is directed by the CS2K, which is responsible for managing call topology, resource allocation/deallocation and resource usage. Media anchoring through the AMS does not require conversion from packet to TDM back to packet again, thus impact on bearer path latency will be minimal.

This activity has 4 main customer impacting deliverables:

- Table Provisioning
- MAPCI
- Operational Measurements (OMs)
- Logs

### 1.2.1 Table Provisioning

The bearer channel tandeming (BCT) capability of the AMS is provisioned in table SERVSINV. The Packet Media Anchor will share the BCT resources with the Lawful Intercept (ALTTERMS application in the table), however the Packet Media Anchor resources must be provisioned as a separate Subtending Application on a particular GWC. The Packet Media Anchor also requires audio resources, thus an audio application may also be provisioned on the same GWC with the BCT applications.

**Figure 2 Table SERVSINV - Packet Media Anchor (PKTMA) provisioning**

| SRVSNAME |   | SRVRNAME |    | NUMTERMS |                                     | OPTIONS |
|----------|---|----------|----|----------|-------------------------------------|---------|
| AUD      | 4 | GWC      | 20 | 4095     | (3PORT 30) (6PORT 30) (ANNC 300) \$ |         |
| BCT      | 0 | GWC      | 20 | 1024     | (ALTTERMS 100) \$                   |         |
| BCT      | 1 | GWC      | 20 | 4095     | (PKTMA_MAX_CALLS 150) \$            |         |

### 1.2.2 MAPCI

A new MAPCI interface is being provided to monitor the availability of Announcement, Conference, Lawful Intercept and Packet Media Anchor resources subtending from a particular GWC.

**Figure 3 MAPCI;PM Posting GWC Media Resources**

|            |                  |        |      |          |           |          |          |         |      |
|------------|------------------|--------|------|----------|-----------|----------|----------|---------|------|
| XAC        | MS               | IOD    | Net  | PM       | CCS       | Lns      | Trks     | Ext     | APPL |
| AMDI       | .                | NODLOG | Istb | 1 SPM    | .         | SYSB     | 48C..    | .       | SDM  |
| M          |                  |        |      | *C*      |           | *C*      | *C*      |         |      |
| GWC        |                  |        |      | SysB     | ManB      | OffL     | CBsy     | ISTb    | InSv |
| 0 Quit     |                  | PM     |      | 11       | 1         | 42       | 8        | 7       | 60   |
| 2 Post_    |                  | GWC    |      | 3        | 0         | 0        | 0        | 0       | 15   |
| 3 Listset  |                  |        |      |          |           |          |          |         |      |
| 4 Listres  | GWC              | 20     | InSv |          |           |          |          |         |      |
| 5          | Unit0:           | Act    | ISTb |          |           |          |          |         |      |
| 6          | Unit1:           | Inact  | ISTb |          |           |          |          |         |      |
| 7          | Listres          |        |      |          |           |          |          |         |      |
| 8          |                  |        |      | MaxPorts | InsvPorts | BsyPorts | CPBports | ResType |      |
| 9          |                  |        |      | -----    | -----     | -----    | -----    | -----   |      |
| 10         | Conf3            |        |      | 30       | 30        | 0        | 0        | CONF    |      |
| 11 Disp_   | Conf6            |        |      | 30       | 30        | 0        | 0        | CONF    |      |
| 12 Next    | Announcements    |        |      | 300      | 50        | 0        | 0        | ANNC    |      |
| 13         | Lawful Intercept |        |      | 90       | 8         | 0        | 0        | BCT     |      |
| 14 QueryPM | PKT Media Anchor |        |      | 90       | 0         | 0        | 0        | BCT     |      |
| 15         |                  |        |      |          |           |          |          |         |      |
| 16         |                  |        |      |          |           |          |          |         |      |
| 17         |                  |        |      |          |           |          |          |         |      |
| 18         |                  |        |      |          |           |          |          |         |      |

### 1.2.3 Operational Measurements

To enable the monitoring of Packet Media Anchoring facilities by downstream OSS systems, a new operational measurement group is being created. The number of PKTMA insertion attempts (PMAREQST), number of insertion failures to do resource exhaustion/no resources (PMAFLNR), and high-water mark (PMAHWM) will be reported.

**Figure 4 Packet Media Anchor OMs**

|                                                               |       |   |     |    |
|---------------------------------------------------------------|-------|---|-----|----|
| PKTMA                                                         |       |   |     |    |
| CLASS: ACTIVE                                                 |       |   |     |    |
| START:2004/05/13 17:35:00 THU; STOP: 2004/05/13 17:37:15 THU; |       |   |     |    |
| SLOWSAMPLES: 2; FASTSAMPLES: 14;                              |       |   |     |    |
| INFO (PKTMA_OM_INFO)                                          |       |   |     |    |
| PMAREQST PMAFLNR PMAFLMSC PMAHWM                              |       |   |     |    |
| 1                                                             | PKTMA | 1 | 200 |    |
|                                                               | 38    | 0 | 0   | 12 |

### 1.2.4 Logs

To better enable troubleshooting of the Announcement, Conference and Packet Media Anchor call setup and configuration issues a new core log (XPKT340) is introduced. This log will inform the craftsperson about the potential announcement, conference or BCT resource set up issues that require addressing. Examples of this log follow:

**Figure 5 Packet Media Anchor Logs**

```
RTP7  XPKT340 OCT25 08:16:40 4500 INFO PKTMA Call Failure
Location: AUD 4
Type: GWC
Orig Agent: LG 23 9 00 07 DN 6195200007
Orig Node: LG 23 9
Term Agent: CKT UASBLDNANN 0
Term Node: AUD 4
Called Number: 5209999
CallID: 49905667
Cause: Number 16 - Audio Operation Failure
IP Address: 47.142.134.147
Signal ID: 51
Phrase ID: 999
0000 0000 0000 0000 0100 0000 1000 0000 0000 0000 0000
0000 0000 2F8E 8693 0033 0004 03E7 0000 3100 0000 0000
```

### 1.2.5 Background

Many services and call processing capabilities on SIP/SIPt require interaction with a call's bearer path to provide progress indications (i.e. tones) into or to collect digits out of the bearer stream. DPT endpoints are logical entities and do not have physical bearer facilities of their own. As well, SIP/SIPt signalling has limited capability to convey tone and/or digit collection requests to preceding offices. Due to this limitation the SIP specification allows for the introduction of a media server into a call topology to perform media functions. The Packet Media Anchor is Nortel's answer to tone insertion and digit extraction on SIP/SIPt.

## 1.3 Hardware Requirements or Dependencies

### 1.3.1 AudioCodes AMS

The AMS audio server 2010 is required for Packet Media Anchor functionality. Both BCT and Audio resources must be provisioned on each AMS that will be used for the PKTMA. The device will register with a CS2K gateway controller and it is expected that multiple AMS devices will be used to comprise the pool of available resources required.

## 1.4 Software Requirements or Dependencies

### 1.4.1 Provisioning

Provisioning for DPT Media Anchors will be provided through CS2K Table Control. Table SERVSINV is the only table that must be provisioned in order to enable Media Anchor endpoints. For additional information on provisioning the Media Anchor see the Configuration section of this feature.

## 1.5 Limitations and restrictions

- The AudioCodes UAS can not support the Packet Media Anchor functionality.
- The Codec Profile for GWCs that control PKTMA resources must only allow the GW to use the G.711 codec.

## 1.6 Interactions

The packet media anchor will be inserted into SIP/SIPt calls that require bearer facility interaction. Some of these scenarios include:

- Local Treatment on a SIP trunk (tone treatment only).
- Digit collection (e.g. DISA service, Auth/Account Codes, CFRA, etc.).
- Interactions with CS2K line or network services (e.g. IN Send-To-Resource) could request digit collection on the trunk, Blind Call Transfer or ACD queuing could request audible ringback on a SIP Trunk after the SIP session has been established. After successful SIP session setup (i.e. “200 OK”) any inband application of tones must be accomplished via the Packet Media Anchor).

## 1.7 Glossary

| Term  | Description            |
|-------|------------------------|
| PMA   | Packet Media Anchor    |
| PKTMA | Packet Media Anchor    |
| UAS   | Universal Audio Server |

## 2: Configuration for A00007120

### 2.1 Hardware and Software Requirements

#### 2.1.1 Required Hardware

- Audiocodes Media Server (AMS) for IP

## 2.1.2 Required Software

- SNO8

## 2.2 Initial Configuration

- Identify the maximum number of anchored calls to support
- Provision the a Packet Media Anchor tuple in table SRVSINV with the maximum number of simultaneous calls to support
- In the GWC element manager:
  - Verify the gateway profile of each AMS is set to “AMS.”
  - Provision a new Network Codec Profile that supports only G.711 for voice calls
  - Change the Codec Profile the AMS GWC uses to be the profile defined above.
- In the AMS element manager provision
  - Three (3) BCT resources for each anchored call. (3 \* the maximum number of simultaneous anchored calls)
  - One (1) Audio resource for each anchored call
- Cold SWACT the ACC GWC or Re-initialize all the AMS gateways

## 2.3 Upgrade Considerations

### 2.3.1 Dump and Restore (CM)

A new option is added in table SERVSINV. There is no impact on the Dump and Restore process.

### 2.3.2 Element Management Upgrade

No impact.

### 2.3.3 Downgrade impact

No impact.

## 2.4 Data schema (DS) (CM, MIBS, RDB)

### 2.4.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------|--------------------------|------------------------------------|
| SERVSINV       | CHANGED                  | UNCHANGED                          |

## 2.4.2 Table Database Schema information

### 2.4.2.1 Name: SERVSINV

GWC Services Inventory

#### 2.4.2.1.1 Functional description

Table SERVSINV lists the services associated with a Gateway Controller. Examples of the supported services are:

- Conferencing
- Announcements
- Lawful intercept
- SIPT and BICC Dynamic Packet Trunking

In SNO8 the new Packet Media Anchor service is added to this list of services provisioned in the table.

#### 2.4.2.1.2 Usage sequence and implications (CM Only)

The table must be datafilled in the following sequence:

- SERVRINV
- SERVSINV

#### 2.4.2.1.3 Size

Table 2 Table size

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory |
|------------------------|----------------|----------------|-----------------------|
| SERVSINV               | 0              | 256            | Protected             |

**2.4.2.1.4 Fields/OIDs** The following table lists the changed fields for table SERVSINV.

Table 3 Table field descriptions

| Field   | New or Changed | Subfield or refinement | Entry                    | Explanation and action                                            |
|---------|----------------|------------------------|--------------------------|-------------------------------------------------------------------|
| OPTIONS | Changed        |                        | See refinement (table 4) | Options. New PKTMA_MAX_CALLS option may be entered in this field. |

OPTION = PKTMA\_MAX\_CALLS

**Table 4 Table field descriptions**

| Field   | New or Changed | Subfield or refinement | Entry           | Explanation and action                                                                                           |
|---------|----------------|------------------------|-----------------|------------------------------------------------------------------------------------------------------------------|
| OPTIONS | new            |                        | PKTMA_MAX_CALLS | Used to control the number of Packet Media Anchor calls. This field contains subfield PKTMA_MAX_CALLS.           |
|         |                | PKTMA_MAX_CALLS        | 1 to 1000       | Anchor calls. Defines the number of supported anchored calls on the audio server. Enter value between 1 to 1000. |

#### 2.4.2.1.5 Datafill example

The following example shows a sample datafill for table SERVSINV. Table 5 shows an example of datafill prior to provisioning the PKTMA\_MAX\_CALLS option. Table 6 shows an example of the provisioning changes when the PKTMA\_MAX\_CALLS option is added.

**Table 5 Table SERVSINV Datafill without the PKTMA\_MAX\_CALLS Option**

```
TABLE: SERVSINV
>LIST ALL
TOP
      SRVSNAME      SRVRNAME  NUMTERMS      OPTIONS
-----
      AUD      4      GWC      20      4095      (3PORT 30) (6PORT 30) (ANNC 300)$
      DPT      6      GWC      15      2048      (      SIPT )$
      BCT      4      GWC      20      1024      (ALTTERMS 90)$
BOTTOM
```

**Table 6 Table SERVSINV Datafill with the PKTMA\_MAX\_CALLS Option**

```
TABLE: SERVSINV
>LIST ALL
TOP
      SRVSNAME      SRVRNAME  NUMTERMS      OPTIONS
-----
      AUD      4      GWC      20      4095      (3PORT 30) (6PORT 30) (ANNC 600)$
      DPT      6      GWC      15      2048      (      SIPT )$
      BCT      4      GWC      20      1024      (ALTTERMS 90)$
      BCT      5      GWC      20      4095      (PKTMA_MAX_CALLS 300)$
BOTTOM
```

#### 2.4.2.1.6 Table release history update

The PKTMA\_MAX\_CALLS option was added in SN08.



#### 2.4.2.1.7 Supplementary information

- A GWC may support a maximum of one BCT node for Lawful Intercept (ALTTERMS) and one BCT node for the Packet Media Anchor (PKTMA\_MAX\_CALLS). Multiple appearances of either option, on a single GWC, is not permitted.
- The PKTMA\_MAX\_CALLS option ranges from 0 to 1000 for future expansion. The functional limit per GWC is 480 PKTMA calls. This limitation is determined with the following calculation:
  - $(30 \text{ PKTMA calls per AMS}) * (16 \text{ AMS gateways per GWC}) = 480 \text{ PKTMA calls per GWC.}$
- The Audio Server must be configured to support three BCT resources and one announcement resource per call. Using the example above, the Audio Server should be configured with:
  - 990 BCT resources:  $(3 * \text{PKTMA\_MAX\_CALLS}) + \text{ALTTERMS}$
  - 600 ANNC resources:  $(\text{Orig. ANNC value}) + (\text{PKTMA\_MAX\_CALLS})$
- Changes to the PKTMA\_MAX\_CALLS parameter require the AMS gateways to be re-initialized for the parameter to take affect.
- The PKTMA option can be provisioned on a GWC that does not have audio resources provisioned in table SERV辛INV; however, the AMS must be provisioned with the following resources to support the PKTMA functionality.
  - Announcement resources
  - BCT resources
  - Voice Prompt file
  - Call Progress Tone file
  - Pre Recorded Tones file
- In the GWC element manager, the profile of the AMS must be set to “AMS,” and not “UAS.” This enables functionality on the AMS necessary to support the PKTMA application.

#### 2.4.2.1.8 Translation verification and other tools

Not Applicable.

## 2.5 Software optionality control (SOC)

Not Applicable.

**Table 7 SOC**

|                          |                        |
|--------------------------|------------------------|
| <b>SOC option name:</b>  |                        |
| SOC option title:        | Yes/No                 |
| SOC option control type: | <state/usage/combined> |
| New SOC option?          | <Yes/No>               |

**Table 7 SOC**

|                        |              |
|------------------------|--------------|
| SOC option order code  | <order code> |
| Option defined in DRU: | <DRU>        |
| Affected products:     | <PCL(s)>     |

## 2.6 User interface changes

### 2.6.1 Directory: GWC

#### 2.6.1.1 Directory description

Posts the GWC peripherals and provides commands for viewing the status of GWC peripherals. No maintenance actions, such as BSY and RTS, can be performed from this MAP level.

#### 2.6.1.2 Accessing directory: GWC

##### 2.6.1.2.1 Access to directory or MAP level and return to CI

>MAPCI;MTC;PM;POST GWC ALL

>QUIT ALL

### 2.6.2 Command: QUIT

#### 2.6.2.1 Command type: Listed MENU

#### 2.6.2.2 Command target: All

#### 2.6.2.3 Command availability: RES

#### 2.6.2.4 Command description

Exits the GWC level and returns the user to a previous MAP level or to the CI prompt.

#### 2.6.2.5 Command syntax

**Table 8 QUIT command parameters and variables**

| Command                  | Parameters and variables             |
|--------------------------|--------------------------------------|
| QUIT                     | <nlevels   incrname   ALL>           |
| Parameters and variables | Description                          |
| nlevels                  | Exits the specified number of levels |

**Table 8 QUIT command parameters and variables**

| Command  | Parameters and variables      |
|----------|-------------------------------|
| incrname | Exits the specified increment |
| All      | Returns to the CI prompt      |

**2.6.2.6 Qualifications and warnings**

None.

**2.6.2.7 Example Commands**

>MAPCI;MTC;PM;POST GWC ALL

- Enters the GWC MAP level and places all GWC type peripherals in the posted set.

>QUIT

- Returns to the PM MAP level

>QUIT All

- Returns to the CI level

**2.6.3 Command: POST****2.6.3.1 Command type: Listed MENU****2.6.3.2 Command target: All****2.6.3.3 Command availability: RES****2.6.3.4 Command description**

Used to post a specific GWC, or a set of GWC type peripherals.

**2.6.3.5 Command syntax****Table 9 POST command parameters and variables**

| Command                  | Parameters and variables                                                                                                                                                                         |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| POST                     | [<All> {All}]<br>[<PMNo>.... {0 TO 2047}]<br>[<PMTYPE>...{GWC [<All> {All}]<br>[<PMNo>... {0 TO 255}}]<br>[<state>... {SysB, ManB, OffL, CBsy, ISTb, InSv}]<br>[<Alarm>... {Minor, Major, Crit}] |
| Parameters and variables | Description                                                                                                                                                                                      |

**Table 9 POST command parameters and variables**

| Command | Parameters and variables                         |
|---------|--------------------------------------------------|
| ALL     | Posts all GWC type peripherals                   |
| PMNo    | Posts a specific GWC using the PM Number         |
| PMTYPE  | Posts all GWC type peripherals or a specific GWC |
| State   | Posts all GWC peripherals in the specified state |
| Alarm   | Posts all GWC peripherals in the specified state |

**2.6.3.6 Qualifications and warnings**

None.

**2.6.3.7 Example Commands**

>MAPCI;MTC;PM;POST GWC ALL

- Enters the GWC MAP level and places all GWC type peripherals in the posted set.

>POST 2

- Displays GWC 2 and modifies the posted set to contain only GWC 2.

>POST MANB

1. Changes the posted set to contain GWC peripherals in the MANB state.

**2.6.4 Command: LISTSET****2.6.4.1 Command type: Listed MENU****2.6.4.2 Command target: All****2.6.4.3 Command availability: RES****2.6.4.4 Command description**

Lists the peripherals in the current posted set.

**2.6.4.5 Command syntax****Table 10 LISTSET command parameters and variables**

| Command | Parameters and variables    |
|---------|-----------------------------|
| LISTSET | noparm<br><ALL><br><PMTYPE> |

**Table 10 LISTSET command parameters and variables**

| Command                  | Parameters and variables                                                                                       |
|--------------------------|----------------------------------------------------------------------------------------------------------------|
| Parameters and variables | Description                                                                                                    |
| noparm                   | Displays a list of the peripherals in the current posted set                                                   |
| All                      | Displays details about the posted set: total number of peripherals posted and the number of different PM types |
| PMType                   | Displays a list of the specified PM type peripherals in the posted set                                         |

**2.6.4.6 Qualifications and warnings**

None.

**2.6.4.7 Example Commands**

>LISTSET

- Displays a concise list of the peripherals in the posted set

>LISTSET ALL

- Displays a summary of the number of peripherals and the number of different types of peripherals in the posted set.

>POST GWC

- Displays the list of GWC peripherals in the posted set.

**2.6.5 Command: DISP****2.6.5.1 Command type: Listed MENU****2.6.5.2 Command target: All****2.6.5.3 Command availability: RES****2.6.5.4 Command description**

Display all PMs in the specified PM state.

**2.6.5.5 Command syntax****Table 11 DISP command parameters and variables**

| Command | Parameters and variables                                                                                                                |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------|
| DISP    | <p>&lt;Option&gt; {STATE &lt;state&gt; {SysB, ManB, OffL, CBsy, ISTb, InSv},<br/>DIAGHIST}</p> <p>[&lt;PM Type&gt; {TM2, ..., GWC}]</p> |

**Table 11 DISP command parameters and variables**

| Command                  | Parameters and variables                                                     |
|--------------------------|------------------------------------------------------------------------------|
| Parameters and variables | Description                                                                  |
| STATE                    | Display the PMs in a specific state                                          |
| DIAGHIST                 | Display the diagnostic history of all PMs                                    |
| PM Type                  | Specify the state, or diagnostic history, for all PMs of a specific PM type. |

### 2.6.5.6 Qualifications and warnings

- The DIAGHIST option of this command is not valid for GWC type peripherals.

### 2.6.5.7 Example Commands

>DISP STATE MANB

- Displays a concise list of the peripherals in the MANB state

>DISP STATE MANB GWC

- Displays a concise list of all GWC type peripherals in the MANB state.

## 2.6.6 Command: NEXT

### 2.6.6.1 Command type: Listed MENU

### 2.6.6.2 Command target: All

### 2.6.6.3 Command availability: RES

### 2.6.6.4 Command description

Step to the next PM in post set or to the first PM of the next PM type in post set

### 2.6.6.5 Command syntax

**Table 12 NEXT command parameters and variables**

| Command                  | Parameters and variables                             |
|--------------------------|------------------------------------------------------|
| NEXT                     | [<PM TYPE> {PMTYPE}]                                 |
| Parameters and variables | Description                                          |
| PMTYPE                   | Optional parameter for stepping to the next PM type. |

### 2.6.6.6 Qualifications and warnings

None.

### 2.6.6.7 Example Commands

>NEXT

- Steps to the next PM in the post set

>NEXT PMTYPE

- Steps to the next PM type in the post set

## 2.6.7 Command: LISTRES

### 2.6.7.1 Command type: Listed MENU

### 2.6.7.2 Command target: All

### 2.6.7.3 Command availability: RES

### 2.6.7.4 Command description

Displays information related resources associated with the Gateway Controller (GWC). The command is only valid for Audio Server GWCs. The resources presented are:

- Announcements
- Conferencing
- Lawful Intercept
- Packet Media Anchor

For each resource type, the following data is displayed:

- Maximum number of provisioned resources in table SERVSINV (MaxPorts)
- Number of in-service resources (InsvPorts)
- Number of resources involved in a call (CPBports)
- Number of busy resources (BsyPorts)

The LISTRES command provides a snapshot of the resource usage, the MAP display is not updated dynamically. The command must be re-entered to update the display.

### 2.6.7.5 Command syntax

**Table 13** LISTRES command parameters and variables

| Command | Parameters and variables |
|---------|--------------------------|
| LISTRES | None.                    |

**Table 13 LISTRES command parameters and variables**

| Command                  | Parameters and variables |
|--------------------------|--------------------------|
| Parameters and variables | Description              |

**2.6.7.6 Qualifications and warnings**

- The command is only valid for Audio Server GWC type peripherals.

**2.6.7.7 Example Commands**

>LISTRES

- Displays the resource information.

**2.6.7.8 Example MAPCI Screen**

|            |                  |        |      |          |           |          |          |      |         |
|------------|------------------|--------|------|----------|-----------|----------|----------|------|---------|
| XAC        | MS               | IOD    | Net  | PM       | CCS       | Lns      | Trks     | Ext  | APPL    |
| AMDI       | .                | NODLOG | Istb | 1 SPM    | .         | SYSB     | 48C..    | .    | SDM     |
| M          |                  |        |      | *C*      |           | *C*      | *C*      |      |         |
| GWC        |                  |        |      | SysB     | ManB      | OffL     | CBsy     | ISTb | InSv    |
| 0 Quit     |                  | PM     |      | 11       | 1         | 42       | 8        | 7    | 60      |
| 2 Post_    |                  | GWC    |      | 3        | 0         | 0        | 0        | 0    | 15      |
| 3 Listset  |                  |        |      |          |           |          |          |      |         |
| 4 Listres  | GWC              | 20     | InSv |          |           |          |          |      |         |
| 5          | Unit0:           | Act    | ISTb |          |           |          |          |      |         |
| 6          | Unit1:           | Inact  | SysB |          |           |          |          |      |         |
| 7          | Listres          |        |      |          |           |          |          |      |         |
| 8          |                  |        |      | MaxPorts | InsvPorts | BsyPorts | CPBports |      | ResType |
| 9          |                  |        |      | -----    | -----     | -----    | -----    |      | -----   |
| 10         | Conf3            |        |      | 30       | 30        | 0        | 0        |      | CONF    |
| 11 Disp_   | Conf6            |        |      | 30       | 30        | 0        | 0        |      | CONF    |
| 12 Next    | Announcements    |        |      | 300      | 50        | 0        | 0        |      | ANNC    |
| 13         | Lawful Intercept |        |      | 90       | 8         | 0        | 0        |      | BCT     |
| 14 QueryPM | PKT Media Anchor |        |      | 90       | 0         | 0        | 0        |      | BCT     |
| 15         |                  |        |      |          |           |          |          |      |         |
| 16         |                  |        |      |          |           |          |          |      |         |
| 17         |                  |        |      |          |           |          |          |      |         |
| 18         |                  |        |      |          |           |          |          |      |         |



## 2.6.8 Command: QUERYPM

### 2.6.8.1 Command type: Listed MENU

### 2.6.8.2 Command target: All

### 2.6.8.3 Command availability: RES

### 2.6.8.4 Command description

Presents general information about the posted GWC, including:

- The load name for each unit
- The active unit IP address
- In-service trouble reasons

### 2.6.8.5 Command syntax

**Table 14 LISTRES command parameters and variables**

| Command                  | Parameters and variables                                                 |
|--------------------------|--------------------------------------------------------------------------|
| QUERYPM                  | [<option> {FLT,<br>CNTRS,<br>FILES,<br>CONFIG,<br>DIAGHIST,<br>ABICONN}] |
| Parameters and variables | Description                                                              |
| none                     | Displays general information about the posted GWC                        |
| FLT                      | Displays in-service trouble reasons for the GWC                          |
| CNTRS                    | Not supported for GWC type peripherals                                   |
| FILES                    | Not supported for GWC type peripherals                                   |
| CONFIG                   | Not supported for GWC type peripherals                                   |
| DIAGHIST                 | Not supported for GWC type peripherals                                   |
| ABICONN                  | Not supported for GWC type peripherals                                   |

### 2.6.8.6 Qualifications and warnings

- GWC Type peripherals only support the “FLT” option.

### 2.6.8.7 Example Commands

>QUERYPM

- Displays general information regarding the posted GWC

>QUERYPM FLT

- Displays in-service trouble reasons for the posted GWC

## 2.7 Configuration Walkthrough

- Identify the maximum number of anchored calls to support
- Provision the a Dynamic Packet Trunk Media Anchor tuple in table SRVSINV with the maximum number of simultaneous calls to support
- In the GWC element manager:
  - Verify the gateway profile of each AMS on the GWC is set to “AMS.” (See note 2 below).
  - Provision a new Network Codec Profile that supports only G.711 for voice calls
  - Change the Codec Profile the AMS GWC uses to be the profile defined above.
- In the AMS element manager provision
  - Three (3) BCT resources for each anchored call. (3 \* the maximum number of simultaneous anchored calls)
  - One (1) Audio resource for each anchored call
- Cold SWACT the ACC GWC or Re-initialize all the AMS gateways
- Use the LISTRES command to verify resource allocation. All discrepancies between the provisioned resources (MaxPorts) and in-service resources (InsvPorts) should be investigated. Differences may be caused by
  - Provisioning errors in the gateway element manager
  - Provisioning errors in table SERVSINV
  - Gateways not registered with the GWC

### Notes:

1. Ensure each AMS is configured with the following files to support the PKTMA functionality.
  - Voice Prompt file
  - Call Progress Tones file
  - Pre Recorded Tones file
2. When converting an existing AMS to support the PKTMA functionality, the AMS must be disassociated from the GWC in the GWC element manager and re-associated using the new AMS profile. Standard maintenance procedures should be followed to perform this action as it will result in a call processing outage on the gateway.

## 3: Performance for A00007120

### 3.1 Performance management strategy

The Packet Media Anchor (PKTMA) performance management provides the customer a means to monitor the PKTMA resources. To assist the customer with network engineering, the system monitors:

- Anchored call attempts
- Failed anchored call attempts
- Maximum anchored call attempts (High Water Mark)

A new XPKT340 log will be introduced for reporting a variety of Gateway, Gateway Controller, and PKTMA resource problems. The infrastructure for such logs will be constructed.

### 3.2 Performance management tools and utilities

When an Packet Media Anchor is provisioned in table SERVSINV, the PKTMA Operational Measurement group can be used to monitor the anchor resource usage. To view the group data the OMSHOW CI command may be used.

Example: OMSHOW PKTMA ACTIVE

### 3.3 Performance Measurements (PM), Operational Measurements (OM), and stats

PKTMA presents usage counts for Dynamic Packet Trunk Anchor resources.

#### 3.3.1 PM, OM, and stats format

Performance Measurement Name: PKTMA

Performance Measurement Description: Presents usage counts on a GWC basis

Performance Registers: PMAREQST, PMAFLNR, PMAHWM

History: Created in SN08/GWC11

#### 3.3.2 OM Group template (applies only to DMS)

##### 3.3.2.1 OM description

PKTMA

Packet Media Anchor

### 3.3.2.2 Release history update

The OM group is new in SN08.

### 3.3.2.3 Registers

OM group registers display on the MAP terminal as follows:

**Figure 1 OM Group Display**

PMAREQST                      PMAFLNRPMAHWM

### 3.3.2.4 Group structure

OM group provides 1 tuple for each GWC provisioned with PKTMA resources.

Key field: Integer.

The PKTMA anchor number derived from datafill order

Info field: PKTMA\_OM\_INFO

Presents the GWC number and the maximum number of anchored calls supported by the GWC resources.

Example:

1                      GWC 20      125

### 3.3.2.5 Associated OM groups

None.

### 3.3.2.6 Associated functional groups

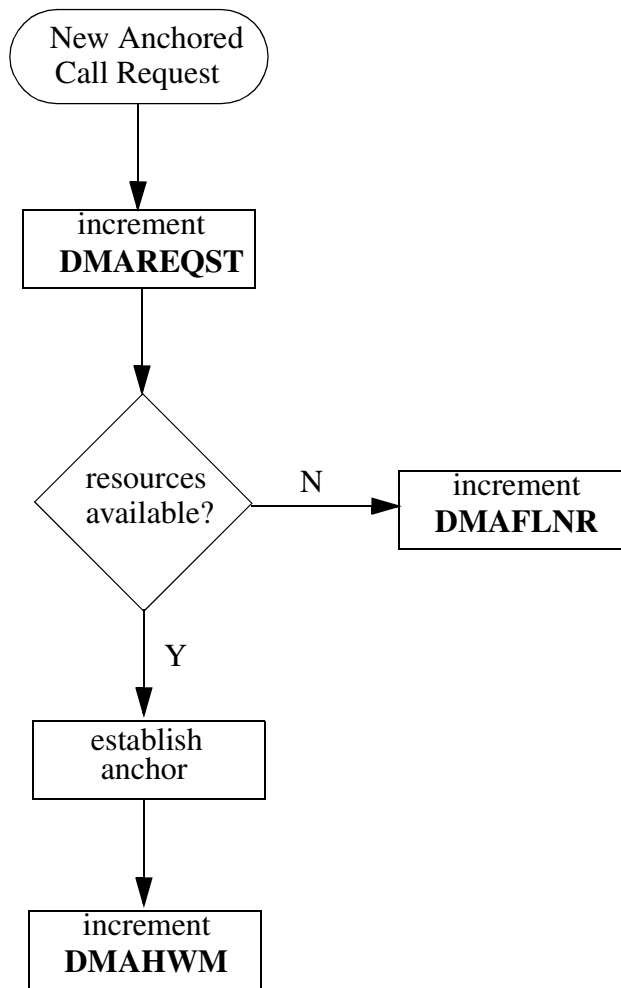
The following functional groups are associated with OM group: None.

### 3.3.2.7 Associated functionality codes

**Table 15 Functionality codes associated with OM group**

| Functionality | Code |
|---------------|------|
| NA            |      |
| NA            |      |

### 3.3.2.8 OM group registers logic flow chart



### 3.3.3 Register (applies only to DMS)

#### 3.3.3.1 PMAREQST Register description

Register PMAREQST:

PMAREQST is a peg register to indicate the number of anchored call attempts.

#### 3.3.3.2 Register release history update

New in SN08

#### 3.3.3.3 Associated registers

None.

**3.3.3.4 Associated logs**

None.

**3.3.3.5 PMAFLNR Register description**

Register PMAFLNR

PMAFLNR is a peg register to indicate the number of failed anchored call attempts due to the unavailability of resources.

**3.3.3.6 Register release history update**

New in SN08

**3.3.3.7 Associated registers**

None.

**3.3.3.8 Associated logs**

XPKT340 log will be generated for failed anchor attempts.

**3.3.3.9 PMAHWM Register description**

Register PMAHWM

PMAHWM is a high water mark register to indicate the maximum number of simultaneous anchored calls.

**3.3.3.10 Register release history update**

New in SN08

**3.3.3.11 Associated registers**

None.

**3.3.3.12 Associated logs**

None.

**3.4 New XPKT340 log.**

The infra-structure to generate an XPKT340 log will be added for SN08.

**3.5 Log format**

An example of such a log is shown in Table 16 on page 1115.

**Table 16 example XPKT340 log**

|                                                                        |  |
|------------------------------------------------------------------------|--|
| RTP7 <b>XPKT340</b> FEB01 11:44:12 7100 INFO PKTMA <b>Call Failure</b> |  |
| Location: DPT 3                                                        |  |
| Type: GWC                                                              |  |
| Orig Agent: GRP BICCINTRA1                                             |  |
| <b>Orig Node: DPT 3</b>                                                |  |
| Term Agent: GRP BICCINTRA2                                             |  |
| <b>Term Node: SPM 4</b>                                                |  |
| Called Number: 9686930                                                 |  |
| CallID: 28705228                                                       |  |
| Cause: Number 20 - No PKTMA Resources                                  |  |
| 0000 0000 0000 0000 0300 0000 1400 0000 0000 000                       |  |
| 0000 0000 0000 EE5E 0000 0000 0000 0000 1C1C 1C1C                      |  |

The anticipated type of logs to be output, along with the information pertaining to them is shown in the following table. Note all messages will display hex debug information. The Debug Info field in the table lists information detailed in a more readable format from the hex data, which is displayed prior to the hex display.

**Table 17 XPKT340 Log Detail**

| Cause | Output String on CM     | Debug Info                                                                                                                                                                                                                                    |
|-------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 16    | Audio operation failure | IP address, signal ID, phrase ID.<br><br>example specific data:<br>Cause: Number 16 - Audio Operation Failure<br>IP Address: 47.142.134.147<br>Signal ID: 51<br>Phrase ID: 999                                                                |
| 17    | Gateway Exception       | IP address, GWC exception value, protocol error code, signal ID.<br><br>example specific data:<br>Cause: Number 17 - Gateway Exception<br>IP Address: 47.142.134.147<br>Gateway Exception Value: 11<br>Protocol Error Code: 0<br>Signal ID: 0 |
| 18    | No Conf Resources       | None                                                                                                                                                                                                                                          |
| 19    | No Annc resources       | None                                                                                                                                                                                                                                          |

| Cause | Output String on CM | Debug Info |
|-------|---------------------|------------|
| 20    | No PKTMA Resources  | None       |
| 21    | Max Anchored Calls  | None       |

Note: When a signal ID or phrase ID is output, only one ID is provided, so in the cases where more than one signal or phrase has been requested, the first one in the request is provided. Typically only one signal is required in a request. There are times when more than one phrase is requested in a single request, but the phrases are usually very unique so that providing the first of the phrase segments indicates which announcement phrase list has been requested and subsequently resulted in an audio failure.

### 3.6 Log management

When a error cause is logged which indicates an exception at the audio server, the craftsperson should check the error code (associated protocol specifications are used to determine the error cause meaning) to determine the possible mismatch. For errors indicating an unsupported request, the craftsperson should check the audio server for appropriate signal and audio provisioning.

When a GW cause is logged which indicates a missing phrase from the audio server, the craftsperson should check the announcement datafill at the call server (Table ANNAUDID, Table ANNPHLST) for the announcement phrases which contain the flagged segment ID, and these segments must be compared against those supported on the audio server. Then action must be taken by the craftsperson to either change the call server datafill to use audio segments that are supported on the audio server, or the desired audio segments must be incorporated on the audio server.

When an resource unavailable cause is logged, the craftsperson should compare the call server audio datafill (table SERVSINV) against the provisioned port data on the audio server to determine if this information matches and if the provisioned port size is large enough to provide the announcement and conferencing support needed for the office.

***Product = CS 2000***

**A00007121--New Map Level for SPM maintenance**



## *Functional Description*

### 1.1 Applicable Solution(s)

DMS

### 1.2 Description

This feature has the following component.

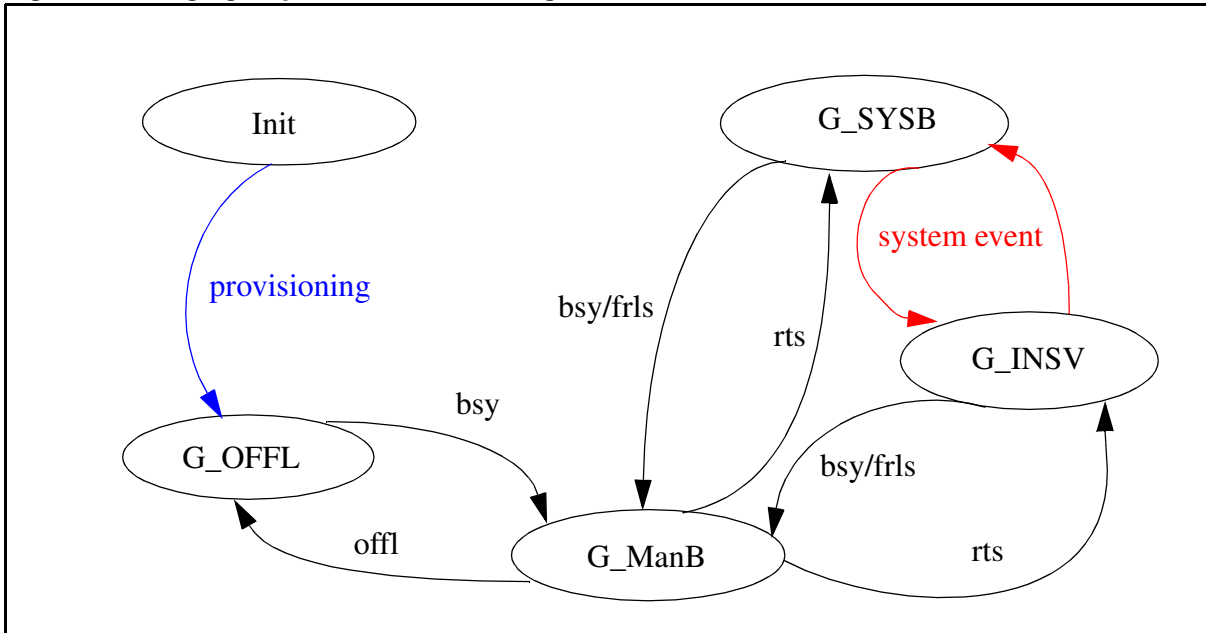
- Provide an IW bridge Map maintenance for deload.
  - This feature introduces an IW bridge maintenance MAP level (BrgMtce) which provides a method to deload call processing from IW bridges.

#### 1.2.1 IW Bridge Maintenance

A new MAP level 'BRGmtce' will be provided to manage the state of the IW SPM bridge terminals. **Offl**, **Bsy**, **Rts**, **Frls**, **Post** and **Next** commands will be provided at this command subdirectory.

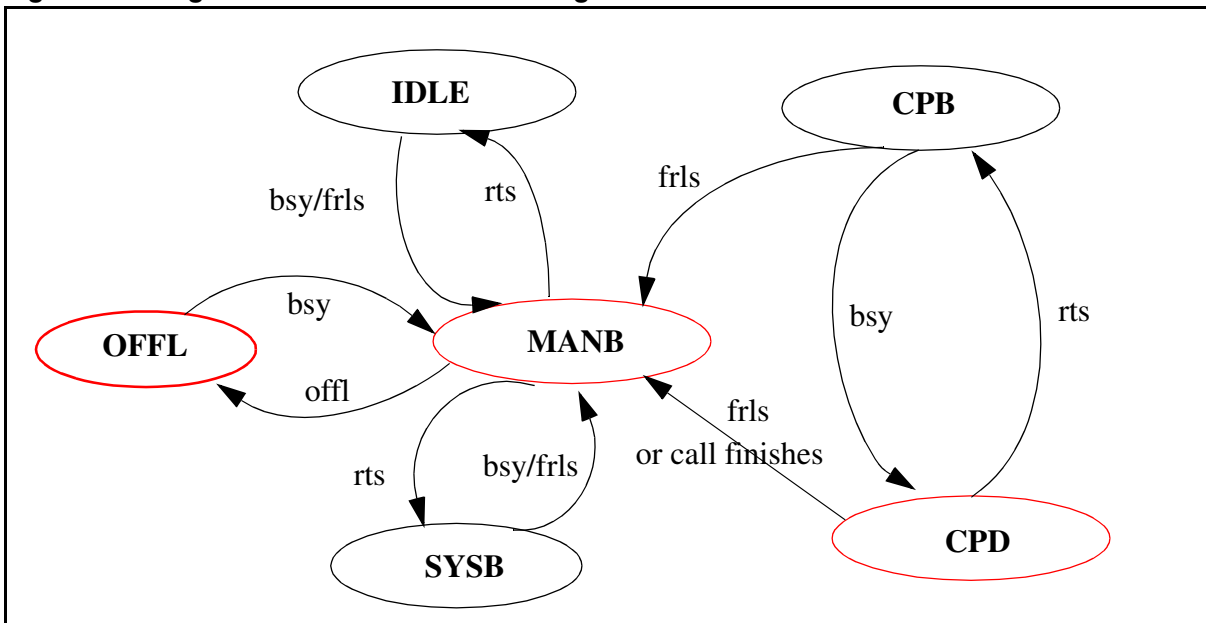
A new status for all terminals on an IW SPM bridge is going to be introduced: deload, which means that the bridge involving in a call will be put in a pending deload state before the call is terminated. The bridge will no longer be available to CallP when the old call terminates. This state will be set via the **Bsy** command. Prior to having deload status, the IW SPM bridge terminal has the following states: Idle, Call Processing Busy and System Busy. When combining the deload state with these three states, the following new terminal states are introduced: Call Processing Deload and Manual Busy. In addition, Offl state will be introduced to the state of bridge terminals. This will be the initial state and can only be set when the group state of bridges in a DS512 link is G\_ManB.

A new group state of bridge terminals in each DS512 link, {G\_OFFL, G\_MANB, G\_SYSB, G\_INSV}, will be introduced. These states are used to determine the individual bridge terminal state, which can be OFFL, MANB, SYSB, CPB, CPD, and IDLE. The state transition diagram for the bridge group state is depicted as follows:

**Figure 2 bridge group state transition diagram**

Note that rts command will be rejected if the group state of bridges in a DS512 link is G\_SYSB.

The bridge terminal state transition due to manual actions is shown in the following figure:

**Figure 3 Bridge terminal state transition diagram**

The following list describes the required IW SPM bridge terminal state transitions that result from the Bsy command:

- Idle to Manual Busy - this transition results from a 'Busy' command being issued to a bridge terminal that is in the 'idle' state.
- Call Processing Busy to Call Processing Deload - this transition results from a Bsy command being issued to a bridge terminal that is in the 'call processing busy' state.
- System Busy to Manual Busy - this transition results from a Bsy command being issued to a bridge terminal that is in the 'system busy' state.
- Off line to Manual Busy - this transition results from a Bsy command being issued to a bridge terminal that is in the 'Off Line' state.

Two options, "all" and "DS512\_link\_number", will be provided. "Bsy all" will "busy" all the bridge terminals of the posted IW SPM, while "Bsy number" will just busy the bridge terminals of the specified DS512 link. The group state of the DS512 link will be set to MANB.

Command **Offl** will be supported to allow the craftsmen to set the state of IW SPM bridge terminals to off line. This command can be issued on the bridge terminal link that is in a ManB state. The group state of the DS512 link will be set to OFFL.

Two options, "all" and "DS512\_link\_number" will be provided. "Offl all" will "offl" all the bridge terminals of the posted IW SPM, while "Offl number" will just offl the bridge terminals of the specified DS512 link.

Command **Rts** will be supported to allow the craftperson to allow the IW SPM bridge terminals to be used by call processing. The following list illustrates the required IW SPM bridge terminal state transitions that result from the 'Rts' command:

- Manual Busy to Idle - this transition results from an 'Rts' command being issued to a bridge terminal that is in the 'manual busy' state and the associated IW SPM node is in service.
- Call Processing Deload to Call Processing Busy - this transition results from an 'Rts' command being issued to a bridge terminal that is in the 'call processing deload' state.
- Manual Busy to System Busy - this transition results from an 'Rts' command being issued to a bridge terminal that is in the 'manual busy' state and the associated IW SPM node is out of service.

Two options, "all" and "DS512\_link\_number", will be provided. "Rts all" will "Rts" all the bridge terminals of the posted IW SPM, while "Rts number" will just Rts the bridge terminals of the specified DS512 link. The group state of the DS512 link will be set to INSV.

Command **Frls** will be supported to allow the craftsperson to remove the IW SPM bridge terminals from use by call processing immediately. The following list illustrates the required IW SPM bridge terminal state transitions that result from the 'Frls' command:

- Idle to Manual Busy - This transition results from a 'Frls' command being issued to a bridge terminal that is in the 'idle' state.
- Call Processing Busy to Manual Busy - this transition results from a 'Frls' command being issued to a bridge terminal that is in the 'call processing busy' state.
- Call Processing Deload to Manual Busy - this transition results from a 'Frls' command being issued to a bridge terminal that is in the 'call processing deload' state.
- System Busy to Manual Busy - this transition results from a 'Frls' command being issued to a bridge terminal that is in the 'system busy' state.

Two options, "all" and "DS512\_link\_number", will be provided. "Frls all" will "Frls" all the bridge terminals of the posted IW SPM, while "Frls number" will just Frls the bridge terminals of the specified DS512 link. The group state of the DS512 link will be set to MANB.

Command **Post** will be supported to display the terminal states of the IW SPM currently posted. It supports the option "all" and "spm #". The following information will be displayed on the map:

- Number of bridge terminals in an 'Idle' state
- Number of bridge terminals in a 'Call Processing Busy' state
- Number of bridge terminals in a 'Call Processing Deload' state
- Number of bridge terminals in a 'Manual Busy' state
- Number of bridge terminals in a 'System Busy' state
- Number of bridge terminals in a 'Offl Line' state

The above terminal status window will be updated continuously.

Command **Next** will be supported to display the terminal states of the next IW SPM in the post set (post set is created via "post all"). If the current IW SPM is the last one in the post set, Next will clear the display on the map.

**Note 1:** The newly introduced deload state is independent of the IW node state. This means that the IW SPM bridge terminal states can be driven separately from the state of the IW SPM node.

**Note 2:** The requirements described above will be applicable to all types of IW SPMs.

### 1.2.1.1 Accessing 'BrgMtce' from PKT MAPCI level

BrgMtce subdirectory is created up the MAPCI;MTC;APPL;PKT level of MAPCI as shown in Figure 1.

**Figure 4 Accessing BRGMtce level from PKT level**

```

XAC      MS      IOD      Net      PM      CCS      Lns      Trks      Ext      APPL
.      MSpair 1DDUOS  2CBsy  1EIU  10  RS      .      333C.. 2Crit 2 PKT
*C*      M      M      *C*      *C*      *C*      *C*      *C*      M
PKT
0 Quit      .      .      .      .      .      .      .      2 PKT      .
2
3
4 SPM_ATM   SPM_ATM:
5
6
7
8 BRGMTCE
9
10
11
12
13
14
15
16
17          PKT:
18
19      MAP1
Time 02:28

```

**Figure 5 BRGmtce MAP level**

|     |        |                   |         |        |               |       |        |      |        |
|-----|--------|-------------------|---------|--------|---------------|-------|--------|------|--------|
| XAC | MS     | IOD               | Net     | PM     | CCS           | Lns   | Trks   | Ext  | APPL   |
| .   | MSpair | 2MPCOS            | 2CBsy   | 1EIU   | 8             | RS    | 38C..  | .    | .      |
|     | *C*    | M                 | M       | *C*    | *C*           |       | *C*    |      |        |
|     |        | OAMAP             | ATMFW   | SDM    | SPMCP         | SWMTC | SDMBIL | PKT  | TOPSIP |
| 0   | Quit   | .                 | .       | .      | .             | .     | .      | .    | .      |
| 2   | Post_  |                   |         |        |               |       |        |      |        |
| 3   |        |                   |         |        |               |       |        |      |        |
| 4   |        | SPM_ATM = .       |         |        |               |       |        |      |        |
| 5   | Bsy_   |                   |         |        |               |       |        |      |        |
| 6   | Rts_   | IWSPM: SPM 3 OFFL |         |        | BearNTWK: ATM |       |        |      |        |
| 7   | Offl_  | Link:             | BRGMTCE | STATE: | CPD:          | CPB:  | SYSB:  | IDL: | MANB:  |
| 8   | FrIs_  | 0                 | OFFL    |        | 0             | 0     | 0      | 0    | 504    |
| 9   |        | 1                 | OFFL    |        | 0             | 0     | 0      | 0    | 504    |
| 10  |        | 2                 | OFFL    |        | 0             | 0     | 0      | 0    | 504    |
| 11  |        | 3                 | OFFL    |        | 0             | 0     | 0      | 0    | 504    |
| 12  | Next   | -----             |         |        |               |       |        |      |        |
| 13  |        |                   |         |        | 0             | 0     | 0      | 0    | 2016   |
| 14  |        |                   |         |        |               |       |        |      |        |
| 15  |        |                   |         |        |               |       |        |      |        |
| 16  |        |                   |         |        |               |       |        |      |        |
| 17  |        |                   |         |        |               |       |        |      |        |
| 18  |        |                   |         |        |               |       |        |      |        |
|     | YD     |                   |         |        |               |       |        |      |        |
| >   |        |                   |         |        |               |       |        |      |        |

### 1.2.1.2 New Logs

Four new logs are created: IWBM502, IWBM503, IWBM504, IWBM505.

The following new logs will be created to keep the users informed about the group state transitions.

- IWBM502 - A Bsy command being requested for a set of IW SPM bridge terminals.

```
RTP708AK  ** IWBM502 AUG12 00:37:09 5900 INFO MBSY IW Bridge Terminals
           SPM Number: 3
           DS512 link: 3
           IW bridge group state changed from SYSB to MANB
           IW bridge terminal range: 1 through 504
           Reason: Manual Request
           Issued by: YD2
```

- IWBM503 - A Rts command being requested for a set of IW SPM bridge terminals.

RTP708AK      IWB503 AUG12 00:37:19 6700 INFO RTS IW Bridge Terminals  
SPM Number: 3  
DS512 link: 0  
IW bridge group state changed from MANB to SYSB  
IW bridge terminal range: 1513 through 2016  
Reason: Manual Request  
Issued by: YD2

- IWB504: An Offl command being requested for a set of IW SPM bridge terminals.

RTP708AK    \*\* IWB504 AUG12 00:04:26 3200 INFO OFFL IW Bridge Terminals  
SPM Number: 3  
DS512 link: 3  
IW group terminal state changed from OFFL to MANB  
IW bridge terminal range: 1 through 504  
Reason: Manual Request  
Issued by: YD2

- IWB505 - A Frls command being requested for a set of IW SPM bridge terminals.

RTP708AK    \*\* IWB505 AUG12 00:37:51 8000 INFO FRLS IW Bridge Terminals  
SPM Number: 3  
DS512 link: 3  
IW bridge group state changed from SYSB to MANB  
IW bridge terminal range: 1 through 504  
Reason: Manual Request  
Issued by: YD2

## 1.3 Hardware Requirements or Dependencies

N/A

## 1.4 Software Requirements or Dependencies

## 1.5 Limitations and restrictions

Since the newly introduced Offl state will be set as an initial bridge terminal state in SN08, the group state of barges in each DS512 link and bridge terminal state need to be restored on the newly active side over swact. The bridge terminal state transition over swact will be as follows:

From SN08 to SN08, SysB -> SysB, Idle -> Idle, CPB -> CPB

From SN08 to SN08: OFFL -> OFFL, SysB -> SysB, Idle -> Idle, CPB -> CPB, ManB -> ManB, CPD -> CPD

## 1.6 Interactions

Once the deload state is ON (ManB) on a bridge terminal, new calls cannot be established using that bridge.

## 1.7 Applicable customer facing sections

### Fault Management

Logs ☒

Alarms ☐

### Configuration

Data Schema ☐

User Interface ☒

Element Management ☐

Security ☐

Service Order ☐

Office Parameters ☐

Accounting (includes AMA billing) ☐

Performance (includes operational measurements) ☐

## 1.8 Glossary

| Term  | Description                             |
|-------|-----------------------------------------|
| CI    | Command Interpreter                     |
| CPB   | Call Processing Busy                    |
| CPD   | Call Processing Deload                  |
| IWSPM | InterWorking Spectrum Peripheral Module |

***Product = CS 2000***

## A00007135--GWC DPT Audits and Counter Drift Prevention

**Note:** This activity also applies to MG4k and DPT SPM, not just GWC.



## 1.1 Applicable Solution(s)

UA-IP

## 1.2 Description

This feature addresses two areas of weakness in the existing DPT application:

### 1. Counter drift.

DPT software has several counters, e.g., the total number of DPT terminals in use, that have been observed to drift from their proper values over time. Negative consequences of counter drift include network management and OM distortions, SWERRs on certain scenarios (e.g. dead shelf recovery), and artificially reduced DPT capacity.

### 2. Trunk OM anomalies

DPT OMs are both unlike regular trunk OMs and sometimes quite similar also. This “split personality” has led to issues both with documentation and behavior.

### 1.2.1 Counter drift

Any changes made by this activity to handle counter drift will be visible in greater accuracy of the OMs described in the next section of this document.

### 1.2.2 Trunk OM anomalies

The changes made by this activity to the OMs TRK, DPTOFC, and DPTNODE are behavioral and/or documentation clarifications:

- No new OMs are introduced by this activity.
- No new registers are introduced by this activity.
- No existing OMs are removed by this activity.
- No existing registers are removed by this activity.

### 1.2.3 Behavioral Changes

#### 1.2.3.1 OMs DPTOFC and DPTNODE

For registers DPTNODE::DPTGTAT and DPTOFC::DPGTAT/DPGTAT2 the “attempts” counted at the nodal level exclude failed optimization attempts whereas the office level OM includes them. The pegging of these registers will be changed such that both the nodal level and the office level are counted at the same point (except in cases where the code exits prior to knowing a particular node).

The DPTOFC::DPGTFLO/DPGTFLO2 registers & DPTNODE::DPTGTFLO registers will be changed such that failed optimized attempts on nodes “not DPT-enabled” are not pegged against these registers.

The changes described here will also change the corresponding registers in the DPTOFCP OM.

### 1.2.3.2 OM TRK

Register MAXBU is effectively disabled for DPT trunk groups. The value of the MAXBU register for a DPT trunk group will always be equal to zero.

The MAXBU register was designed to be used with non-DPT trunks. The DPTOFC and DPTNODE usage registers and high water registers are directly applicable to DPT trunks and should be used in the place of the MAXBU register.

This change was sourced in the SN07 stream by CR Q00868638.

## 1.2.4 Documentation Clarification

### 1.2.4.1 OM - DPTOFC

Customers have requested that the documented descriptions of the DPTOFC and DPTNODE OMs be clarified. The CR Q00881441, states “*Customer would like better explanation or data to reflect exactly what we are trying to determine with this field*”, i.e., the DPTNODE OM register DPTHWT. As well, Nortel employees have noted that the documentation is confusing for these OMs, especially the high water registers.

The intent of this activity is to increase the accuracy of the DPT OMs and to rewrite the customer facing documentation for OM DPTOFC and OM DPTNODE. To help understand the DPT OMs the following definitions are provided:

#### 1.2.4.1.1 Definitions

- optimized

In the context of the DPT OMs this means “occurring on the same device”. An “optimized” attempt is an attempt to get a TID from the same device (where “device” is an MG4K, DPT SPM, or DPT GWC) that hosts the other agent in the call.

- non-optimized

A “get” attempt not constrained to be on the same device (where “device” is an MG4K, DPT SPM, or DPT GWC).

- port depletion

The exhaustion of the DPT terminal pool, because the DPT SOC limit on usable DPT tids has been exceeded.

- cpb

The number of terminals that are call processing busy.

— cpd

The number of terminals that are call processing deloaded. Where CPD is a terminal that is CPB on a device that is no longer in service, such as, during an upgrade.

The DPTOFC OM provides information for the entire office and is composed of the registers described in “Table 1 OM - DPTOFC” shown below.

**Table 1 OM - DPTOFC**

| Register | Extension Register | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DPGTAT   | DPGTAT2            | <p>The number of attempts to get a DPT Terminal.</p> <p>This is an incremental register. The register is pegged every time an attempt to get a DPT terminal is made within a given transfer period.</p> <p>For a typical SIPT call the number of pegs is in the range of 1 peg per DPT agent per call.</p> <p>For a typical BICC<sup>a</sup> call the number of pegs is in the range of 1 to 3 pegs per DPT agent per call.</p>                                                                                                                                                                                                |
| DPGTFL   | DPGTFL2            | <p>The number of attempts to get a DPT Terminal that failed (non-optimized).</p> <p>This is an incremental register. The register is pegged every time an attempt to get a <i>non-optimized</i> DPT terminal fails within a given transfer period.</p>                                                                                                                                                                                                                                                                                                                                                                         |
| DPUSAG   | DPUSAG2            | <p>The number of DPT Terminals in use.</p> <p>This is an accumulator register. The register is pegged every one-hundred seconds within a given transfer period.</p> <p>The formula used for calculating the usage is as follows:</p> $\text{current\_usage} = (\text{current\_cpb} + \text{current\_cpd})$ $\text{usage\_om} = \text{usage\_om} + \text{current\_usage}$ <p>Since this register is an accumulator and is added to itself the register can be misleading.</p> <p>To interpret the usage register divide the value by the number of slow samples to determine the average usage for a given transfer period.</p> |

Table 1 OM - DPTOFC

| Register | Extension Register | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DPGTFLO  | DPGTFLO2           | <p>The number of attempts to get a DPT Terminal that failed (optimized).</p> <p>This is an incremental register. The register is pegged every time an attempt to get an <i>optimized</i> DPT terminal fails within a given transfer period.</p> <p>Optimized failure attempts on nodes “not DPT-enabled” are not pegged against this register.</p> <p>Pegs to this register do not signify call failures. The optimized failure attempt to get an optimized terminal is immediately followed by an attempt to get a non-optimized terminal instead.</p> |
| DPHWT    | DPHWT2             | <p>The high water mark for number of DPT Terminals in use.</p> <p>This register is pegged every ten seconds within a given transfer period.</p> <p>The formula used for calculating high water mark is as follows:</p> <pre> current_usage = (current_cpb + current_cpd) <b>if</b> current_usage &gt; high_water_mark_om <b>then</b>     high_water_mark_om = current_usage <b>else</b>     register is <i>NOT</i> updated <b>endif</b> </pre>                                                                                                          |
| DPDPL    | DPDPL2             | <p>The number of attempts to get a DPT Terminal that failed due to port depletion.</p> <p>This is an incremental register. The register is pegged every time an attempt to get a DPT terminal fails due to port depletion within a given transfer period.</p>                                                                                                                                                                                                                                                                                           |

a. For further information about BICC OMs see the FN of A89007299 in PLS FM-DOC.

### 1.2.5 Considerations

When using a customer defined long duration OM by using a customer defined “accumulating” class (rather than the active or holding class) the meaning of the high water registers (DPHWT/DPHWT2) changes. In this case the value of the high water mark is only valid when divided by the number of transfer periods within the duration of the long duration OM. The result of which is the *average* high water mark for the long term duration. For example, if we define a “weekly” long duration class, with 15 minutes transfer periods, we would need to divide the high water mark by 672 [(7days \* 24 hours \* 60 minutes)/15 minute transfer period].

**Note:** It is recommended that the DPTOFC/DPTOFCP/DPTNODE high water registers **not** be used in conjunction with long duration “accumulating” OMs. For more information on “accumulating” registers see NTP 297-1001-300, Section 1, Understanding the Operational Measurement System, sub section Measurement Classes, pg 1-9, v 03.08, May 2000.

Figure 1 below shows an example of the DPTOFC OM.

**Figure 1 OM DPTOFC**

|                                                               |         |         |          |   |
|---------------------------------------------------------------|---------|---------|----------|---|
| >omshow dptofc holding                                        |         |         |          |   |
| DPTOFC                                                        |         |         |          |   |
| CLASS: HOLDING                                                |         |         |          |   |
| START:2004/06/30 17:30:00 WED; STOP: 2004/06/30 18:00:00 WED; |         |         |          |   |
| SLOWSAMPLES: 18 ; FASTSAMPLES: 180 ;                          |         |         |          |   |
| DPGTAT                                                        | DPGTAT2 | DPGTFL  | DPGTFL2  |   |
| DPUSAG                                                        | DPUSAG2 | DPGTFLO | DPGTFLO2 |   |
| DPHWT                                                         | DPHWT2  | DPDPL   | DPDPL2   |   |
| 0                                                             | 0       | 0       | 0        | 0 |
|                                                               | 0       | 0       | 0        | 0 |
|                                                               | 0       | 0       | 0        | 0 |

### 1.2.5.1 OM - DPTNODE

The DPTNODE OM provides information per DPT node. Each is composed of the registers described in “Table 2 OM - DPTNODE”

**Table 2 OM - DPTNODE**

| Register | Extension Register | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DPTGTAT  | DPTGTAT2           | <p>The number of attempts to get a DPT Terminal for a particular DPT node.</p> <p>This is an incremental register. The register is pegged every time an attempt to get a DPT terminal is made within a given transfer period.</p> <p>For a typical SIPT call the number of pegs is in the range of 1 peg per DPT agent per call.</p> <p>For a typical BICC<sup>a</sup> call the number of pegs is in the range of 1 to 3 pegs per DPT agent per call.</p>                                                                                                                                                                                                |
| DPTGTFL  | n/a                | <p>The number of attempts to get a DPT Terminal that failed (non-optimized) for a particular DPT node.</p> <p>This is an incremental register. The register is pegged every time an attempt to get a <i>non-optimized</i> DPT terminal fails within a given transfer period.</p>                                                                                                                                                                                                                                                                                                                                                                         |
| DPTUSAG  | DPTUSAG2           | <p>The number of DPT Terminals in use for a particular DPT node.</p> <p>This is an accumulator register. The register is pegged every one-hundred seconds within a given transfer period.</p> <p>The formula used for calculating the usage is as follows:</p> $\text{current\_usage} = (\text{current\_cpb} + \text{current\_cpd})$ $\text{usage\_om} = \text{usage\_om} + \text{current\_usage}$ <p>Since this register is an accumulator and is added to itself the register can be misleading.</p> <p>To interpret the usage register divide the value by the number of slow samples to determine the average usage for a given transfer period.</p> |

Table 2 OM - DPTNODE

| Register | Extension Register | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DPTGTFLO | n/a                | <p>The number of attempts to get a DPT Terminal that failed (optimized) for a particular DPT node.</p> <p>This is an incremental register. The register is pegged every time an attempt to get an <i>optimized</i> DPT terminal fails within a given transfer period.</p> <p>Optimized failure attempts on nodes “not DPT-enabled” are not pegged against this register.</p> <p>Pegs to this register do not signify call failures. The optimized failure attempt to get an optimized terminal is immediately followed by an attempt to get a non-optimized terminal instead.</p> |
| DPTHWT   | n/a                | <p>The high water mark for number of DPT Terminals in use for a particular DPT node.</p> <p>This register is pegged every ten seconds within a given transfer period.</p> <p>The formula used for calculating high water mark is as follows:</p> <pre> current_usage = (current_cpb + current_cpd) <b>if</b> current_usage &gt; high_water_mark_om <b>then</b>     high_water_mark_om = current_usage <b>else</b>     register is <i>NOT</i> updated <b>endif</b> </pre>                                                                                                          |

a. For further information about BICC OMs see the FN of A89007299 in PLS FM-DOC.

Figure 2 below shows an example of the DPTNODE OM.

**Figure 2 OM DPTNODE**

```

>omshow dptnode holding
DPTNODE
CLASS: HOLDING
START:2004/06/30 17:30:00 WED; STOP: 2004/06/30 18:00:00 WED;
SLOWSAMPLES: 18 ; FASTSAMPLES: 180 ;
INFO (DPT_NODE_OM_PM_INFO)
      DPTGTAT  DPTGTAT2  DPTGTFL  DPTGTFL0
      DPTUSAG  DPTUSAG2  DPTHWT
0      GWC      4      83
      0      0      0      0
      0      0      0      0

```

**1.3 Hardware Requirements or Dependencies**

None.

**1.4 Software Requirements or Dependencies**

None.

**1.5 Limitations and restrictions**

None.

**1.6 Interactions**

None.

**1.7 Applicable customer facing sections**

Fault Management

Logs \_\_\_\_\_

Alarms \_\_\_\_\_

Configuration

Data Schema \_\_\_\_\_

User Interface \_\_\_\_\_

Element Management \_\_\_\_\_

Security \_\_\_\_\_

Service Order \_\_\_\_\_

Office Parameters \_\_\_\_\_

Accounting (includes AMA billing) \_\_\_\_\_

Performance (includes operational measurements)   X<sup>1</sup>



## 1.8 Glossary

| Term | Description             |
|------|-------------------------|
| DPT  | Dynamic Packet Trunk    |
| OM   | Operational Measurement |

### *Product = CS 2000*

## **A00007196--PacketCable™ Event Messaging For Accounting** *Functional Description*

### **1.1 Applicable Solution(s)**

IAC

### **1.2 Description**

#### **1.2.1 Background**

CableLabs is a consortium of cable operators and cable equipment vendors that creates specifications for cable. This work is done under the “PacketCable™” project ([www.packetcable.com](http://www.packetcable.com)). The purpose of the PacketCable™ project is to ensure Cable Network Operators’ desired functionality is available and to promote vendor inter-operability. In order to provide a billing capability, PacketCable™ has created a specification for an event reporting mechanism that is called “PacketCable™ Event Messaging” (PCEM). PCEM uses RADIUS accounting (RFC 2866) to deliver event messages to a record keeping server (RKS). This activity provides an implementation of PCEM for the Succession Cable Solution.

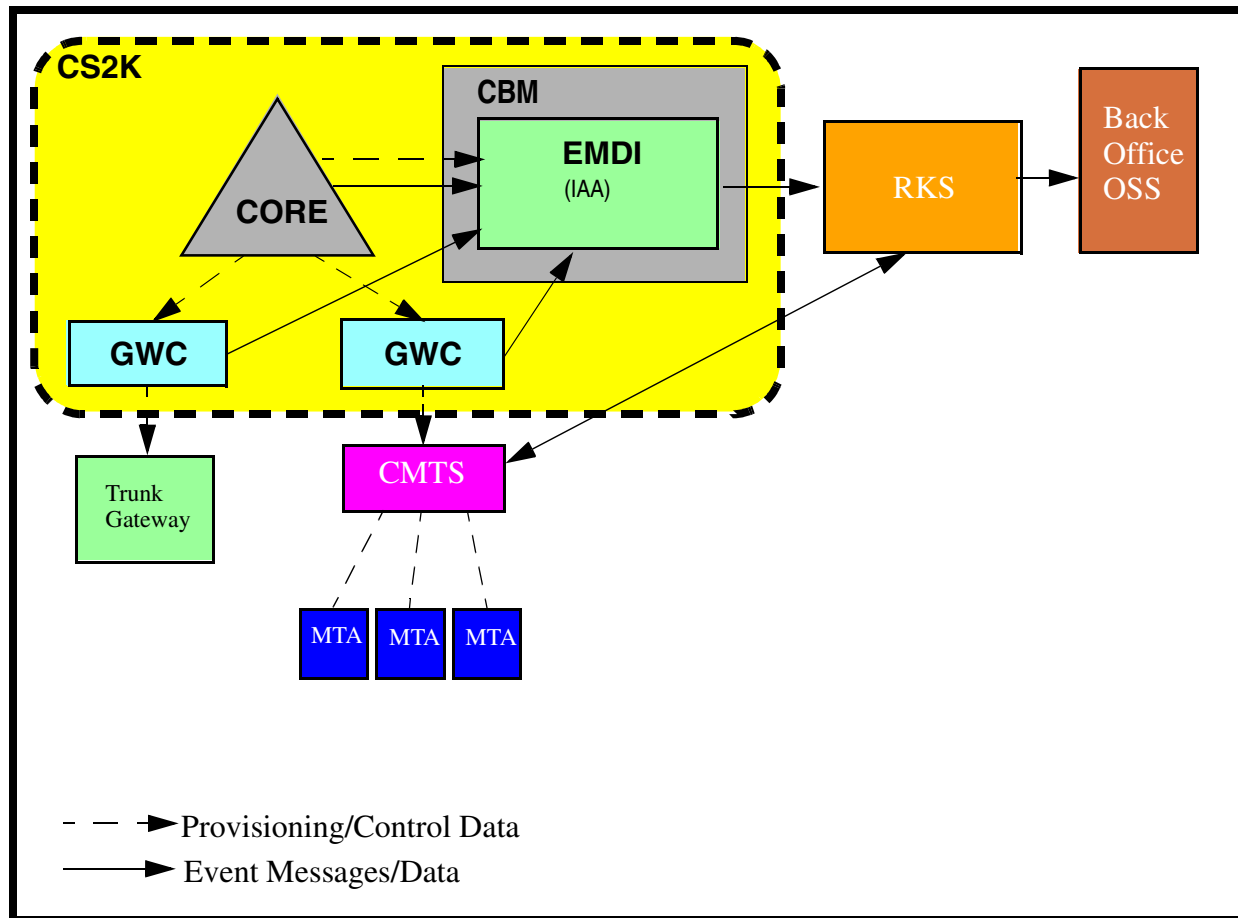
This development activity is one component of Nortel’s development effort to support “Packet Cable 1.5” compliance in the Succession Cable Solution.

This activity provides CMS PacketCable™ 1.5 compliance with PCEM for PacketCable™. Specifically for event messaging PKT-SP-EM-I10.

---

1. There is no performance section within this document since there are no visible changes to the OMs. However, the changes documented in this FN need to be propagated into any customer visible documentation that describes these OMs. The DPT OMs were originally defined in PLS FMDOC A59015752.

## 1.2.2 Component Architecture



The EMDI (Event Messaging Delivery Interface) encapsulates the capability of formatting event messages with RADIUS headers and sending to the RKS (including retries). For this activity, the EMDI is provided by the IAA (Integrated Accounting Application) on the CBM. The IAA may also receive event messages from the GWC for ES (Electronic Surveillance).

The RKS (Record Keeping Server) is third party equipment provided by any RKS vendor. The RKS receives event messages from the EMDI and the CMTS.

The PacketCable™ architecture refers to two network elements that are not labeled in figure 1, the CMS and the MGC. The CMS, or call management server, is PacketCable™'s line solution. Nortel implements the CMS by using functionality in the core and small-lines GWCs. The MGC, or media gateway controller (not to be confused with our GWC), is PacketCable™'s trunk

solution. Nortel implements the MGC using the core and trunk GWCs controlling TGCP trunk gateways.

### 1.2.3 Event Messages

Event messages are generated at different points in the call and they contain information which can be used for billing purposes. For example: a signaling\_start event message contains the calling and called DNs.

Unlike traditional billing systems which generate one billing record when the call is released, packet cable event messaging generates several event messages for each call at various times during the call. Another difference is that event messages are generated for each half call. Generally, each leg of a call consists of two half calls (one for the originator and one for the terminator). Therefore, separate event messages are generated for the originating and terminating call halves.

#### 1.2.3.1 Message Structure

Refer to the Packet Cable specification PKT-SP-EM-I10 for details regarding the individual components in the Packet Cable event messages. Event messages have dynamic lengths. Generally, a message that contains a full 247 byte FEID would have a length of approximately 400 bytes. Typically, FEIDs are shorter than 247 bytes and result in message lengths that average less than 400 bytes.

#### 1.2.3.2 Message Types

**Table 17: PacketCable™ Event Messages**

| Name                 | Description                                                                                                                          |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| Signaling_Start      | Start of signaling for originating or terminating half of the call                                                                   |
| Signaling_Stop       | End of signaling for originating or terminating half of the call                                                                     |
| Database_Query       | An inquiry into an external database; for example 800, LNP. A TCAP with multiple return values from a single query is not supported. |
| QoS_Reserve*         | Reservation of QoS for originating or terminating half of the call                                                                   |
| QoS_Commit*          | Commitment of QoS for originating or terminating half of the call                                                                    |
| QoS_Release*         | Release of QoS for originating or terminating half of the call                                                                       |
| Service_Activation   | Indicates a subscriber has activated a service                                                                                       |
| Service_Instance     | Indicates an occurrence of a service                                                                                                 |
| Service_Deactivation | Indicates a subscriber has deactivated a service                                                                                     |
| Call_Answer          | Indicates that all network resources have been allocated for originating or terminating half of the call                             |

| Name               | Description                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Media_Alive        | Indicates if the call is still active. A media alive event message is generated after an agent (line or trunk) has been active for more than 24 hours. For the report interval and time, PCEM only supports the default value for LONGCALL in table AMAOPTS which is every 24 hours at midnight. |
| Call_Disconnect    | Indicates that all network resources have been released for originating or terminating half of the call                                                                                                                                                                                          |
| Media_Report       | Indicates a change in media session information. ES (Electronic Surveillance) ONLY.                                                                                                                                                                                                              |
| Signal_Instance    | Indicates an NCS signal instance. ES(Electronic Surveillance) ONLY.                                                                                                                                                                                                                              |
| Interconnect_Start | Start of network interconnect signaling (between PacketCable and PSTN) for originating or terminating half of the call                                                                                                                                                                           |
| Interconnect_Stop  | Stop of network interconnect signaling (between PacketCable and PSTN) for originating or terminating part of the call                                                                                                                                                                            |
| Time_Change        | Indicates time change on a network element.                                                                                                                                                                                                                                                      |

\*QOS\_XXXX messages are generated by the CMTS and sent directly to the RKS from the CMTS.

### 1.2.4 Agents Generating Event Messages

PCEM supports the CS2K components that form the packet cable solution. Specifically, PCEM supports event messaging for calls and agents hosted on MTA cable line gateways and trunk agents hosted on TGCP cable gateways.

Agents Types that generate event messages:

- POTS and RES Lines (1FR and 1MR)
- PRI Trunks (PRA)
- ISUP Trunks (IT, ATC, T2, TI, and TO)
- OP MF Trunks
- ES MF Trunks

Agent types that do not generate event messages:

- SIPT
- Announcements

In SN08, the North American, non-IXC, non-Centrex trunk group types (IT, ATC, T2, TI, and TO) are supported.

Typically, tandem trunking is not done in a packet cable solution, however, call forwarding can cause a trunk to trunk call.

## 1.2.5 Features Generating Event Messages

**Table 18: CS2K PCEM Supported Features**

| <i>PKT-SP-EM-I10 Feature Title</i>                                 | <i>Nortel CS2k RES Feature(s)/Notes</i>                                                                      |
|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Interconnection with circuit-switched PSTN                         | Various Trunk Agent Call Types                                                                               |
| Support for 911 emergency services                                 | 911 Routed Calls to PSTN or ES Trunk                                                                         |
| n11 (411, 611, etc.) assume outside directory service              | Directory Assistance                                                                                         |
| Toll-free services (800, 888, 877...)                              | Toll Free Service (TFS on AIN) or E800                                                                       |
| Operator services                                                  | PSTN or OP Trunk                                                                                             |
| Call block service                                                 | Selective Call Rejection(SCRJ)<br>Anonymous Call Rejection(ACRJ)<br>Subscriber Activated Call Blocking(SACB) |
| Call waiting service                                               | Call Waiting (CWT) and Cancel Call Waiting (CCW)                                                             |
| Call forwarding/call redirection services                          | Call Forwarding (CFW/CFDA/CFBL)                                                                              |
| Return call service                                                | Automatic Recall (AR)                                                                                        |
| Repeat call service                                                | Automatic Call Back (ACB)                                                                                    |
| Voice mail service                                                 | Nortel Call Pilot or Non-Nortel using SMDI                                                                   |
| Message waiting indicator service (E-mail/voice mail notification) | Message Waiting (MWT)                                                                                        |
| Three-Way Call                                                     | Three Way Call (3WC)                                                                                         |
| Customer Originated Trace                                          | Customer Originated Trace (COT)                                                                              |

Note: The CS2K supports more features than listed. However, these are the only features contained in the event messaging spec and are therefore the only features that have a defined set of event messages. Activation of event messaging does NOT cause the CS2K to have a diminished feature set.

## 1.2.6 Configuration and Provisioning

To configure the CS 2000 CMS for event messaging, carry out the following steps in order. Detailed instructions for each step appear in subsequent sections.

1. Configure the PCEM Accounting Stream.
2. Configure the Element-ID.
3. Add a COMMON tuple entry in table PCEMENTT.
4. Add an EMDI tuple entry in table PCEMENTT.
5. Add a Timezone tuple entry in table PCEMENTT.
6. Add RKS tuple entries in table PCEMENTT.
7. Add RKSPAIR tuple entries in table PCEMENTT.
8. Add a Financial Entity ID (FEID) in table PCEMFEID.
9. Configure Network Time Source and UTC Offset.
10. Configure RKSPAIR(s)/FEID on IAA/CBM
11. Online the RKS pairs.
12. Offline RKS pairs, if needed.
13. Activate PCEM.

In addition to the above, refer to the IAA documentation for instructions on configuring the server for event message reception/distribution.

Moreover, consult the FN for activity A00006635 regarding details on provisioning of table LNENDPT. In order for a line to generate event messages, table LNENDPT must contain gateway and endpoint name information for the line.

Furthermore, instructions to change the EMDI and the RKS data in table PCEMENTT are described in this section as well.

### 1.2.6.1 STEP 1: Configure Accounting Streams

Add PCEM and PCES stream data fill in table CRSFMT.

```
>table crsfmt
>add<key><format><datadump><cdrscrch><alarms><timerdmp><timerval>
```

For example:

```
>add PCEM PCEMFMT      N NIL_FM  N   N   0
>add PCES PCESFMT      N NIL_FM  N   N   0
```

The resulting CRSFMT table will appear similar to the following:

| TABLE: CRSFMT |         |          |         |        |          |          |
|---------------|---------|----------|---------|--------|----------|----------|
| KEY           | FORMAT  | DATADUMP | CDRSRCH | ALARMS | TIMERDMP | TIMERVAL |
| PCEM          | PCEMFMT | N NIL_FM | N       | N      | 0        |          |
| PCES          | PCESFMT | N NIL_FM | N       | N      | 0        |          |

Change the PCEM and PCES stream datafill in table CRSMAP.

```
>table crsmap
>replace <key> <stream>
```

For example:

```
>replace PCEM PCEM
>replace PCES PCES
```

The resulting CRSMAP table will appear similar to the following:

| TABLE: CRSMAP |        |
|---------------|--------|
| KEY           | STREAM |
| PCES          | PCES   |
| PCEM          | PCEM   |

At this point, consult A00007464/A00007465 for additional details regarding the configuration of the PCEM and PCES streams for delivery of event messages to the EMDI/IAA. The streams must be brought INSV after CRSMAP is datafilled. Add the IAA application must be INSV. Refer to the A00007464 FN for the procedures required to bring the streams INSV. In addition, the IAA application must be active in the CBM. For IAA refer to A00007465.

### 1.2.6.2 STEP 2: Configure Element-ID

The element ID is a number between 0 and 99999 that uniquely identifies the network element within the network. Typically an element ID would be assigned for the CMS and MGC. However, since the CS2K combines the MGC and CMS, a single element ID can be used for the CS2K. The default element ID will be 0 and must be changed to a setting compliant with Packet Cable specifications for each MSO's network.

Set the element ID in table OFCENG:

```
>table OFCENG
>pos Element_ID
>rwok on
>change
PARVAL:0
>12345
TUPLE TO BE CHANGED:
ELEMENT_ID 12345
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
>rwok off
```

In this example, the element has been set to 12345.

### 1.2.6.3 STEP 3: Add the COMMON tuple entry

The COMMON tuple entry contains configuration for the Accounting Sending Mode, and Accounting Indicator and Electronic Surveillance Indicator flags.

```
> table pcementt
> add common 0 common <accounting sending mode> <accounting
indicator> <surveillance indicator>.
```

For example:

```
> add common 0 common realtime y y
```

Where **realtime** is the EM delivery mode, **y** means that EM accounting is enabled and **y** means that EM for electronic surveillance is enabled.

- i. <accounting sending mode> can be set to either real-time, batch or ftp (Realtime Mode - Sends event messages to the RKS as they are generated) (Batch Mode- Multiple event messages are batched in a RADIUS message before sending to the RKS) (FTP Mode- Multiple event messages are stored in a file which are sent to the RKS for processing, using FTP as the transport protocol)
- ii. <accounting indicator> is set to **y** if PacketCable<sup>TM</sup> Accounting event messages are desired, **n** otherwise.
- iii. <surveillance indicator> is set to **y** if PacketCable<sup>TM</sup> Electronic Surveillance event messages are desired, **n** otherwise.

Consult activity A00007548 for information regarding Electronic Surveillance configuration.



#### 1.2.6.4 STEP 4: Add an EMDI Tuple Entry

From the CS2K point of view, the EMDI encapsulates the capability of formatting event messages with RADIUS headers and sending to RKS/DF (including retries).

In the SN08 release, the EMDI capability will be provided by the IAA on the CBM.

```
>table pcementt
>add emdi <index> <entity><ip address><port>
```

For example:

```
>add emdi 0 emdi 1 2 3 4 7109
```

Where the EMDI IP address is 1.2.3.4 and the EMDI port is 7109. In SN08, the IAA default configuration uses port 7109.

The IP address used in this tuple is the IP address of the CBM. For further details, refer to Table 10 in Section 11.5.2.2 of the Configuration document of A00007196.

#### 1.2.6.5 STEP 5: Add the Timezone tuple entry

```
> table pcementt
> add timezone 0 timezone <DST> <direction> <UTC Offset>.
```

For example:

```
>add timezone 0 timezone y plus 053000
```

Where Y indicates that the office is in Daylight Savings Time (DST).

##### Note-

The DST indicator values are:

- Y: The local time of the office is currently in Daylight Savings Time.
- N: The local time of the office is currently in Standard Time.

The value used for the UTC offset does not matter since the system will automatically update the UTC offset to the correct value. See Section 1.2.6.9.

#### 1.2.6.6 STEP 6: Add RKS tuple entries

```
>table pcementt
>add rks <index> rks <ip address> <port>
```

For example:

```
>add rks 21 rks 168 24 0 0 1813
```

Where the RKS entry number is 21, the RKS IP Address is 168.24.0.0, and the RKS Port Number is 1813. Repeat for other RKS IP addresses and ports. The index must be a unique value(i.e, no RKS already assigned for that index) between 0 and 31. A maximum of 32 RKS entries may be added.

Typically, an RKS uses a port number of 1813. However, this must be confirmed with the RKS vendor in order to properly data fill RKS tuples in table PCEMENTT.

### 1.2.6.7 STEP 7: Add RKSPAIR tuple entries

Provision RKS pair(s).

If more than one RKS pair is provisioned, event messages will be evenly distributed across the set of online RKS pairs in a round-robin fashion. All event messages for a given BCID (Billing Correlation ID) will be sent to the same RKS pair.

> **table pcementt.**

> **add rkspair # rkspair <primary rks> <secondary rks> <associated emdi>**

For example:

> **add rkspair 0 rkspair 21 31 0**

Where 21 and 31 are RKS entries and 0 is an EMDI entry in table PCEMENTT.

The index must be a unique value(i.e., no RKSPAIR already assigned for that index) between 0 and 15. A maximum of 16 RKSPAIR entries may be added.

The associated EMDI identifies the “EMDI” (Refer to section 1.2.6.4) that this RKSPAIR expects to receive event messages from.

If desired, both the primary RKS and the secondary RKS can reference the same RKS entry. This allows for support of high-availability RKS systems that present only a single IP address and port for both units.

### 1.2.6.8 STEP 8: Configure Financial Entity ID (FEID)

>**table pcemfeid**

>**add <msodef> <msodmn> [<msodmsn> <msodmn><msodmn>]**

For example:

>**add 0 12345678 'test.feid' \$**

Where 12345678 is the MSO defined data, and the MSO domain name is test.feid. The MSO domain name may be up to 239 characters. Refer to Section 11.5.2.1 of the Configuration document of A00007196 for further details.

### 1.2.6.9 STEP 9: Configure Network Time Source and UTC Offset

The network time source is a NTP server which can be configured from the succession SAM21 element manager where the 3PC call agent is installed. Its UTC offset is based on the timezone the Linux OS is set to use.

Here are steps about how to configure a NTP server to use for 3PC.

1. Start the SAM21 element manager from web.
2. Under Configuration pull down menu, select adding or modifying the SAM21 element manager for the lab.
3. Enter the primary and secondary NTP servers' IP addresses in Primary NTP and Secondary NTP fields.
4. Save the changes.
5. Lock and unlock all SAM21 cards for the NTP server address change to take effect.

The steps to configure a timezone to use under Linux OS where 3PC application is running under are:

1. telnet to the 3PC call agent IP address which can be found from the SAM21 element manager where the card is provisioned.
2. login as a root user.
3. cd to directory: /usr/sbin.
4. Run tzconfig and then following the directions to set it.

The system will use the timezone information to set the UTC in table PCEMENTT automatically.

After using tzconfig changed time zone, the last step is to check timezone tuple in PCEMENTT table to make sure the DST flag (Y/N) is set correctly. If not, the appropriate change needs to be made. The UTC OFFSET in the tuple will be adjusted automatically with the DST flag.

When the DST flag is changed from Y/N to N/Y in table PCEMENTT, the UTC OFFSET will be adjusted automatically by one hour in that tuple. But there is no event message reported in this case since the local system time is not changed.

Another thing to notice is that when changing time zone, it may take several steps for the underline OS to adjust the local time to the correct one, in some cases, the local time may be adjusted to GMT time first and then back to the time zone requested. In this case, there will be 2 event messages generated since the local system time is changed twice. Some times, it even takes more then 2 steps to adjust the time zone. So when checking event messages during the process, care needs to be taken because it may have more than one event messages spilled out. The event message system reports all the time adjustment notified by 3PC during this process. And the time will be synchronized automatically with NTP server.

### 1.2.6.10 STEP 10: Configure RKSPAIR(s)/FEID on IAA/CBM

For full details regarding IAA configuration, please refer to the IAA documents directly (Activity A00007464).

The core is capable of distributing event messages in round robin fashion over the online RKS pairs. Each RKS pair consists of a PRIMARY and a SECONDARY RKS. Please note, it is acceptable to configure the PRIMARY and SECONDARY RKS of an RKS pair to be the same RKS.

As each RKS pair is added to table PCEMENTT, the CS2K core will assign a “channel ID” to the RKS pair. These channel IDs are used in communications between the CS2K and the IAA application as a means of uniquely identifying RKS pairs. Please note, the channel ID is not the same as the RKSPAIR index in table PCEMENTT.

When configuring the IAA, the channel IDs (as assigned by the CS2k core) must be assigned to the RKS pairs in the IAA. In order to obtain the channel ID information for use when configuring the IAA, use the PCEMCI tool on the CS2k as follows:

```
>pcemci  
> cidmap
```

The output will appear similar to:

| Collector | Channel ID |
|-----------|------------|
| -----     |            |
| RKSPAIR 0 | -> 1       |

In this example, channel ID 1 has been assigned to RKS pair 0.

At this point, you may telnet to the CBM and invoke the `iaa_config_cli` tool to begin adding output destinations (RKS Pairs). Refer to the A00007464 documentation for full details. The following is a brief example of configuring an output destination on the IAA/CBM.

Telnet to the CBM maintenance interface. At the prompt, enter “iaa\_config\_cli”.

For example:

**maint: iaa\_config\_cli**

This will display the IAA config “Main” menu:

**Status: None**

```
=====
=
Main Menu                               Page 1 of 1
=====
==
1. Global Parameters
2. Output Destinations
=====
==
[S]ave   e[X]it   [N]extPage   [P]revPage   [Q]uit
Select:
```

Enter 2 to select “Output Destinations” this will display the “Output Destinations” menu:

Status: None

```
=====
==
Output Destinations                     Page 1 of 1
=====
==
1. Delivery Function Destinations
2. Record Keeping Server Destinations
=====
=
[S]ave   [R]eturn   [N]extPage   [P]revPage   [Q]uit
Select:
```

Select option 2 for “Record Keeping Server Destinations” this will display the RKS destinations menu:

**Status: None**

```
=====
==
```

```

=====
Record Keeping Server Destinations      Page 1 of 1
=====
==
1. List
2. New
3. Copy
4. Edit
5. View
6. Delete

=====
==
[S]ave   [R]eturn   [N]extPage   [P]revPage   [Q]uit
Select:

```

From this menu select option 2 “New” to display the “RKS Destination Parameter” menu:

**Status: None**

```

=====
==
RKS Destination Parameters      Page 1 of 3
=====
==
1. Channel ID           [ ]
2. Description           [ ]
3. Primary IP Address    [ ]
4. Primary RADIUS Port   [ ]
5. Secondary IP Address  [ ]
6. Secondary RADIUS Port [ ]
7. Retry Limit           [3]
8. Retry Interval        [3]
9. Shared Secret         [0000000000000000]
10. Batch Interval        [3]
11. Messages In Batch    [5]

=====
==
[A]dd   [R]eturn   [N]extPage   [P]revPage   [Q]uit
Select:

```

Select each field and enter the appropriate information for the primary and secondary RKS for this RKS pair. Although not required, a suggested value for the description field would be the RKS pair index from table PCEMENTT on the CS2k core. For example “RKSPAIR 0”.

Be sure to enter the Channel ID (use the channel ID provided by the PCEMCI>CIDMAP command on the CS2K core for this RKS pair).

There are several pages of information that must be entered for each RKS destination. Please refer to the A00007464 documents for details.

When all data has been entered, select option “A” to add the new RKS pair data in the IAA.

After adding the RKS pair to the IAA, you can list the RKS destination from the “RKS Server Destinations” menu as follows:

**Status: None**

```
=====
=
      Record Keeping Server Destinations      Page 1 of 1
=====
=

1. List
2. New
3. Copy
4. Edit
5. View
6. Delete

=====
==
[S]ave   [R]eturn   [N]extPage   [P]revPage   [Q]uit
Select:
```

Select option 1 to list the Channel IDs and RKS destinations configured in the IAA:

```
=====
==
      Record Keeping Server Destinations List
=====
==

  Ch ID   Description
  =====
1.   1    RKSPAIR 0

Hit Enter to Return
```

In addition to the RKS destination information, various “Global” parameters must be configured on the IAA. To do this, select option 1 “Global Parameters” from the IAA config “Main” menu. The global parameters menu will be displayed:

**Status: None**

```
=====
==
      Global Parameters      Page 1 of 1
=====
==
```

1. Element ID [99887]
2. Packet Cable Format Version [1]
3. Enable Daylight Saving [1]
4. UTC Offset [-050000]
5. Sending Mode [0]
- \* 6. Base EM File Path [/cbmdata/00/iaa/ftpout/]
7. EM File Path [stockroom]

Note: \* Fields are not Editable

=====

==

[S]ave    [R]eturn    [N]extPage    [P]revPage    [Q]uit

#### Select:

Select each of the fields and enter the data. Be sure to enter the element ID (as configured on the CS2K in STEP 2 of this procedure). When all data has been entered, save the changes (option s)

Once all of the RKS pairs and Global Parameters have been added in the IAA, proceed to the next step "Online the RKS pairs"

### 1.2.6.11 STEP 11: Online the RKS pairs

RKS pairs must be online to be included in the set of RKS(s) that the CMS will use as destinations when sending event messages. The event messages will be distributed over the set of online RKS pairs in round-robin fashion.

To enable an RKSPAIR to receive accounting event messages, set the RKSPAIR status to ONLINE:

```
>pcemci
> rkspair <desired pair #> online
```

For example:

```
> rkspair 0 online
```

where 0 is an RKSPAIR entry in table PCEMENTT.

### 1.2.6.12 STEP 12: Offline RKS pairs, if needed

RKS pairs must be online to be included in the set of RKS(s) that the CMS will use as destinations when sending event messages. The event messages will be distributed over the set of online RKS pairs in round-robin fashion.

If an RKSPAIR must be removed from the round-robin selection for delivery of event messages, set the RKSPAIR to offline as follows:

```
>pcemci
> rkspair <desired pair #> offline
```

For example:

```
>rkspair 0 offline
```



Offlining an RKS pair will prevent the RKS pair from being selected as a destination for EM delivery for new calls. Already existing calls queued against a particular RKS pair will continue using the RKS pair until the current call has concluded.

### 1.2.6.13 STEP 13: Activate PCEM

Activating PCEM with Accounting active in table PCEMENTT will cause event message generation for all lines and trunks in the CS2K.

```
>table ofceng
>pos pcem_is_active
>rwok on
>change
PARMVAL:N
>Y
TUPLE TO BE CHANGED:
  PCEM_IS_ACTIVE Y
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
>Y
>rwok off
```

All of the previous step must be done prior to activation of PCEM or an error message will be generated. See Section 11.3.2.1 in the Configuration document of A00007196 for details.

### 1.2.6.14 Changing EMDI tuple in table PCEMENTT

The following ordered steps **MUST** be followed **before** changing the EMDI IP address in table PCEMENTT:

1. Stop the IAA application in the CBM. (See Note below.)
2. Perform the EMDI IP address/port change in the IAA.
3. Start the IAA application in the CBM. (See Note below.)

**Note:** The SDM Application Manager (SAM) controls the starting and stopping of the IAA. (See FN Sections 2.2.3 and 2.2.4 of A00007465.) While the IAA application is stopped, the Accounting Event Messages from the CORE are saved in the PCEM SBA stream.

After the above ordered steps, change the EMDI IP address in table PCEMENTT.<sup>2</sup>

### 1.2.6.15 Changing RKS data in table PCEMENTT

To change an RKS IP address/port.

1. Perform the RKS IP address/port change in the IAA application in the CBM. Use the RKS Output Destination (RKSOD) GUI as described in Configuration Section 1.4.2.1 of A00007465.

---

2. Event messages from the GWCs will be lost until after the EMDI IP address/port has been changed in the CORE. This is because the GWCs are only notified of the new EMDI data when the EMDI tuple in table PCEMENTT is changed in the CORE.

2. Change the RKS tuple with the new IP address/port in table PCE-MENTT in the CORE. Between steps (1) and (2), QoS\_Commit and QoS\_Release messages for existing calls in the GWCs will be sent to the old RKS IP address.

### 1.2.7 PCEM Operational Measurements (OMs)

In SN08, a new OM group “PCEM” is introduced. It pegs a success or failure for every event message generated by the core for Accounting (CMTS generated event messages are not pegged). Also please note, OM counts are not incremented for event messages generated for Electronic Surveillance.

**Note:** This OM group pegs success and failure based on the core (i.e. it does not peg failures for messages that fail to arrive at the RKS after leaving the core).

The register names and definitions are shown in the table below.

**Table 19: PCEM OM Group Register Definitions**

| <i>PCEM Register Name</i> | <i>Definition</i>                    |
|---------------------------|--------------------------------------|
| EMSENT                    | Event message successfully generated |
| EMFAIL                    | Failed to build event message.       |
| EMSYSFL                   | System unable to send event message. |
| EMSENT2                   | Extension register for EMSENT        |
| EMFAIL2                   | Extension register for EMFAIL        |
| EMSYSFL2                  | Extension register for EMSYSFL       |

The current PCEM OM register counts may be displayed using the OMSHOW CI command as follows:

```
>omshow pcem active
PCEM
CLASS: ACTIVE
START:2004/08/04 14:00:00 WED; STOP: 2004/08/04 14:18:08 WED;
SLOWSAMPLES: 11 ; FASTSAMPLES: 108 ;
```

```
EMSENT EMFAIL EMSYSFL
```

```
1 SIGNALING_START
  0          0      0
2 SIGNALING_STOP
  0          0      0
3 DATABASE_QUERY
  0          0      0
6 SERVICE_INSTANCE
  0          0      0
9 SERVICE_ACTIVATION
```

|                         |   |   |   |
|-------------------------|---|---|---|
|                         | 0 | 0 | 0 |
| 10 SERVICE_DEACTIVATION | 0 | 0 | 0 |
| 12 SIGNAL_INSTANCE      | 0 | 0 | 0 |
| 13 INTERCONNECT_START   | 0 | 0 | 0 |
| 14 INTERCONNECT_STOP    | 0 | 0 | 0 |
| 15 CALL_ANSWER          | 0 | 0 | 0 |
| 16 CALL_DISCONNECT      | 0 | 0 | 0 |
| 17 TIME_CHANGE          | 0 | 0 | 0 |
| 20 MEDIA_ALIVE          | 0 | 0 | 0 |

Refer to OM system configuration NTPs for details regarding register holding and transfer periods (NTP 297-9051-8551).

### 1.3 Hardware Requirements or Dependencies

**Table 20: Packet Cable CS2K PCEM Hardware Dependencies**

| Device       | Baseline Hardware                                           |
|--------------|-------------------------------------------------------------|
| GWC          | SN08 Baseline                                               |
| CS2K Core    | 3PC SN08 Baseline                                           |
| CS2M         | SN08 Baseline                                               |
| CBM/SBA/EMDI | SN08 Baseline                                               |
| CMTS         | *compliant to PKT-SP-DQOS-I10-040721 & PKT-SP-EM-I10-040721 |

\* Contact Nortel Networks for inter operability testing results.

## 1.4 Software Requirements or Dependencies

In order to support the generation of event messages, the various network elements must contain at least the following baseline software.

**Table 21: Network Element Software Baselines For PCEM**

| Device            | Baseline PCEM Software Load                                 |
|-------------------|-------------------------------------------------------------|
| GWC               | SN08 Load Lineup                                            |
| CS2K Core(3PC)    | SN08 Load Lineup                                            |
| CS2M              | SN08 Load Lineup                                            |
| Telesciences EMDI |                                                             |
| CBM/SBA           | SN08 Load Lineup                                            |
| CMTS              | *compliant to PKT-SP-DQOS-I10-040721 & PKT-SP-EM-I10-040721 |

\* Contact Nortel Networks for inter operability testing results.

## 1.5 Limitations and restrictions

### 1.5.1 Core ONP/SWACT/Upgrade Maintenance Behavior

**Table 22: ONP/SWACT Accounting EM Behavior**

| MTC Action       | Stable Calls (i.e., answered)                                                                                                                                                    | Unstable Calls                                                                                                                               |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| No Restart SWACT | Calls Remain Active, but the following EMs are prematurely generated <sup>a</sup> :<br>- Call Disconnect,<br>- Interconnect Signaling Stop (for trunks), and<br>- Signaling Stop | Calls Remain Active, but the following EMs are prematurely generated:<br>- Interconnect Signaling Stop (for trunks), and<br>- Signaling Stop |

**Table 22: ONP/SWACT Accounting EM Behavior**

| MTC Action     | Stable Calls (i.e., answered)                                                                     | Unstable Calls                                                                                                                                                        |
|----------------|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Warm Restart   | Calls Remain Active, accounting EMs continue to generate after Restart                            | Calls Released, the following EMs are generated when the calls are released after the restart:<br>- Interconnect Signaling Stop (for trunks), and<br>- Signaling Stop |
| Cold Restart   | Calls Released, No Further Event messages. Unmatched signaling start and signaling stop possible. | Calls Released, No Further Event messages. Unmatched signaling start and signaling stop possible.                                                                     |
| Reload Restart | Calls Released, No Further Event messages. Unmatched signaling start and signaling stop possible. | Calls Released, No Further Event messages. Unmatched signaling start and signaling stop possible.                                                                     |

a. Similar behavior as with premature billing records.

### 1.5.2 GWC SWACT/Upgrade Maintenance Behavior

In general, the CS2K will continue to generate accounting event messages for calls that survive GWC warm swact.

**Table 23: GWC Maintenance Behavior**

| MTC Action | Stable Calls                                                                                                                          | Unstable Calls                                                                                                                        |
|------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Warm SWACT | Survives SWACT, accounting EMs continue to be generated normally after the SWACT                                                      | Call Released, EMs generated at release.                                                                                              |
| Cold SWACT | Call Released, EMs generated for end of call (GWC generated EMs[i.e. PCES media report] will not be generated at the end of the call) | Call Released, EMs generated for end of call.(GWC generated EMs[i.e. PCES media report] will not be generated at the end of the call) |

**Table 23: GWC Maintenance Behavior**

| MTC Action                                      | Stable Calls                                                                                                                          | Unstable Calls                                                                                                                        |
|-------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Reload (Lock/Unlock, assumes both units locked) | Call Released, EMs generated for end of call.(GWC generated EMs[i.e. PCES media report] will not be generated at the end of the call) | Call Released, EMs generated for end of call.(GWC generated EMs[i.e. PCES media report] will not be generated at the end of the call) |
| GWC Shelf Power Cycle                           | Call Released, EMs generated for end of call.(GWC generated EMs[i.e. PCES media report] will not be generated at the end of the call) | Call Released, EMs generated for end of call.(GWC generated EMs[i.e. PCES media report] will not be generated at the end of the call) |

### 1.5.3 CBM Failure

In the event of CBM failure, the SBA subsystem will queue accounting event messages for later delivery to the CBM. Refer to “SBA Packet Cable Event Messaging” activity A00007464 for further details.

### 1.5.4 RKS Failure

In the event of an RKS failure, the IAA will store accounting event messages for up to seven days or until the RKS becomes available at which time the accounting message information will be delivered to the RKS. Refer to IAA and CBM documentation for further details. This will utilize the IAA FTP delivery mechanism to the RKS.

### 1.5.5 BHCA Capacity

Refer to the IAA/CBM documentation (A00007464) for the call capacity limitations.

### 1.5.6 XA Core Platform Not Supported

PCEM for SN08 is only supported on the 3PC CS2K platform. XA Core is not supported.

### 1.5.7 IBN and MBS Lines

PCEM supports RES and POTS line types in SN08. IBN lines and MBS (Meridian Business Set) lines are not supported.

### 1.5.8 CS2K Trunk Variants

In SN08, only the North American, non-IXC, non-Centrex trunk variants will be supported. This includes OP, ES, PRA, IT, ATC, T2, TI, and TO.

### 1.5.9 SIP-T Trunks

SIP-T trunks do not generate event messages for their call half since they may be used for inter-CMS/MGC calls. However, the exchange of the FEID and Related BCID is not supported by SIP-T. The CMSS agent will support FEID and Related BCID when it is supported and used for inter-CMS/MGC calls.

### 1.5.10 Media\_Alive Event Message

Generation of the Media\_Alive event message is supported. If an agent (line or trunk) is active on an answered call for more than 24 hours, a Media\_Alive event message will be generated for each half call. However, for the report time and interval, PCEM only supports the default value for LONGCALL in table AMAOPTS which is every 24 hours at midnight.

### 1.5.11 Trunk Endpoint Names

MGC trunk agents do not support endpoint names. Therefore, the signaling\_start event message will not contain the mta\_endpoint\_name attribute.

### 1.5.12 Off-net to Off-net Call Forwarding

If an off-net call comes in over an ISUP trunk to a line which is call forwarded to an off-net destination via an ISUP trunk, the Interconnect\_Start event message will not be generated until answer.

### 1.5.13 Database\_Query Multiple Return Values

The Database\_Query event message does not support a TCAP response that contains multiple returned numbers from a single query.

### 1.5.14 SACB Service\_Instance Event

When the SACB feature is active and the subscriber dials a blocked number, a Service\_Instance event message is generated with a service name of Call\_Block. The Service\_Instance event message is generated even if SACB prompts for a PIN and the user overrides the blocking by dialing the correct PIN.

## 1.6 Interactions

PCEM is not affected by other billing streams and can co-exist with other billing types. To activate PCEM, AMA need not be present in the office

## 1.7 Glossary

| TERM       | Description                                                                                                                                              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| ACB        | Automatic Call Back                                                                                                                                      |
| ACRJ       | Anonymous Call Rejection                                                                                                                                 |
| AIN        | Advanced Intelligent Network                                                                                                                             |
| AMA        | Automated Message Accounting                                                                                                                             |
| AR         | Automatic Recall                                                                                                                                         |
| Batch Mode | Multiple Event Messages are batched in a single RADIUS message before sending to RKS                                                                     |
| BCID       | Billing Correlation ID                                                                                                                                   |
| BHCA       | Busy Hour Call Attempts                                                                                                                                  |
| CFW        | Call Forward                                                                                                                                             |
| CMS        | Call Management Server - refers to GWC/CS2K for lines                                                                                                    |
| CMSS       | Call Management Server Signaling                                                                                                                         |
| CMTS       | Cable Modem Termination System                                                                                                                           |
| COT        | Customer Originated Trace                                                                                                                                |
| CW         | Certification Wave                                                                                                                                       |
| DF         | Delivery Function                                                                                                                                        |
| DST        | Daylight Saving Time                                                                                                                                     |
| EMDI       | Event Messaging Delivery Interface                                                                                                                       |
| FCM        | Fabric Control Message                                                                                                                                   |
| FEID       | Financial Entity ID                                                                                                                                      |
| FTP Mode   | File Transfer Protocol Mode: Multiple event messages are stored in a file which are sent to the RKS for processing, using FTP as the transport protocol. |
| GWC        | Gateway Controller                                                                                                                                       |
| IAA        | Integrated Accounting Application                                                                                                                        |
| LI         | Lawful Intercept                                                                                                                                         |



| TERM           | Description                                              |
|----------------|----------------------------------------------------------|
| LNP            | Local Number Portability                                 |
| MGC            | Media Gateway Controller - refers to GWC/CS2K for trunks |
| MTA            | Multimedia Terminal Adapter                              |
| OM             | Operational Measurement                                  |
| ONP            | One Night Process (Procedure followed on office upgrade) |
| PCEM           | Packet Cable Event Messaging                             |
| PCES           | Packet Cable Electronic Surveillance - packet cable LI   |
| QoS            | Quality of Service                                       |
| RADIUS         | Remote Authentication Dial-In User Service               |
| Real-time Mode | Event Messages are sent to RKS as they are generated.    |
| RFC            | Request For Change                                       |
| RKS            | Record Keeping Server                                    |
| RTP            | Real-time Transport Protocol                             |
| SACB           | Subscriber Activated Call Blocking                       |
| SCP            | Service Control Point                                    |
| SCRJ           | Selective Call Rejection                                 |
| SMDI           | Simple Message Desk Interface                            |
| SS7            | Signaling System Number 7                                |
| SWACT          | Switch of Activity (From active to standby unit)         |
| TCAP           | Transactions Capability Application Part                 |
| TCP            | Transmission Control Protocol                            |
| TGCP           | Trunk Gateway Control Protocol                           |
| UDP            | User Datagram Protocol                                   |
| UTC            | Universal Time Coordinated                               |

## *Product = CS 2000*

### **A00007250--ACDMIS over TCP**

#### *Functional Description*

#### **1.1 Applicable Solution(s)**

DMS

#### **1.2 Description**

The ACDMIS feature provides informational ACD messaging concerning ACD events that are occurring on the DMS-100/CS2K to a downstream processor (DSP). Currently, the ACDMIS connectivity between the DMS-100/CS2K and DSP is via an X.25 link that is implemented on the DMS-100/CS2K through an MPC (Multi-Protocol Controller) card in the IOC (Input-Output Controller) module using X.25 protocol.

This SN08 activity will implement the necessary changes to enable the transport of ACDMIS messaging over TCP/IP to a DSP. The new TCP/IP transport will be in addition to the X.25 transport that already exists. The new TCP/IP transport will interface to the ethernet network via the EIU (Ethernet Interface Unit) or via the ethernet port that resides on a Call Agent card for the CS2KCompact.

##### **1.2.1 Functional Overview**

The ACDMIS link is a messaging interface provided by the DMS-100//CS2K to the host MIS computer (or DSP). The information carried across the messaging link allows ACD applications running on the DMS-100/CS2K to communicate with MIS applications running on the host computer. The two-way information flow allows the DMS and host computer to provide enhanced services to an ACD customer.

This feature will provide an ACDMIS link between the switch and the host computer using the TCP/IP protocol via EIU or Call Agent card that uses port 2700. This TCP/IP link may be used as an alternative to the X.25 MPC ACDMIS link. The transport (TCP/IP vs. MPC X.25) used is transparent to any application using the ACDMIS link to communicate with a host computer.

The functional areas of the feature are:

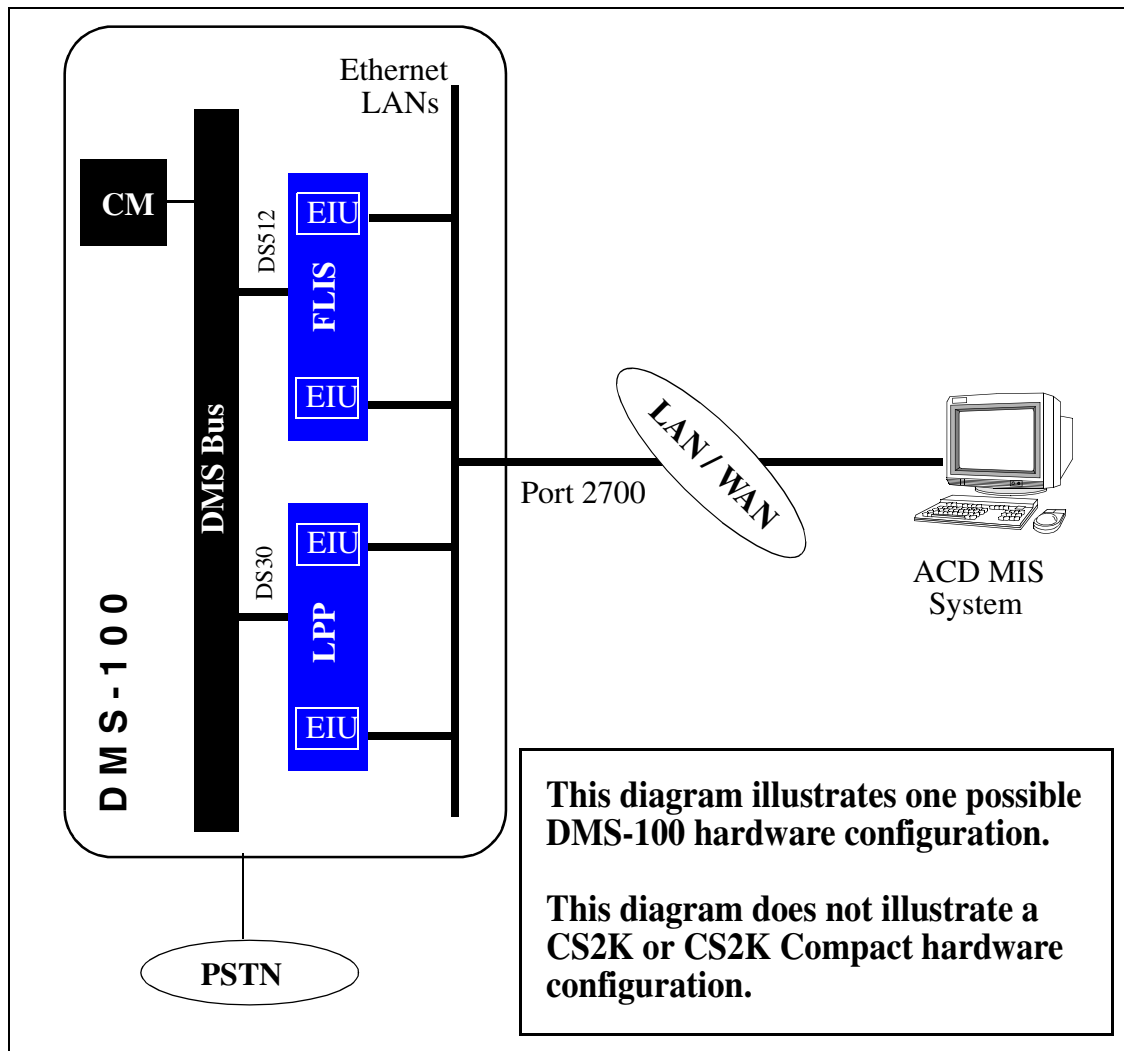
- **TCP/IP transport:** TCP/IP connectivity between the DMS-100/CS2K and the remote DSP through the EIU or Call Agent card on the switch and network access.
- **Table Control:** ACDMIS link datafill to support either X.25 or TCP/IP transport via the ACDMISPL table.

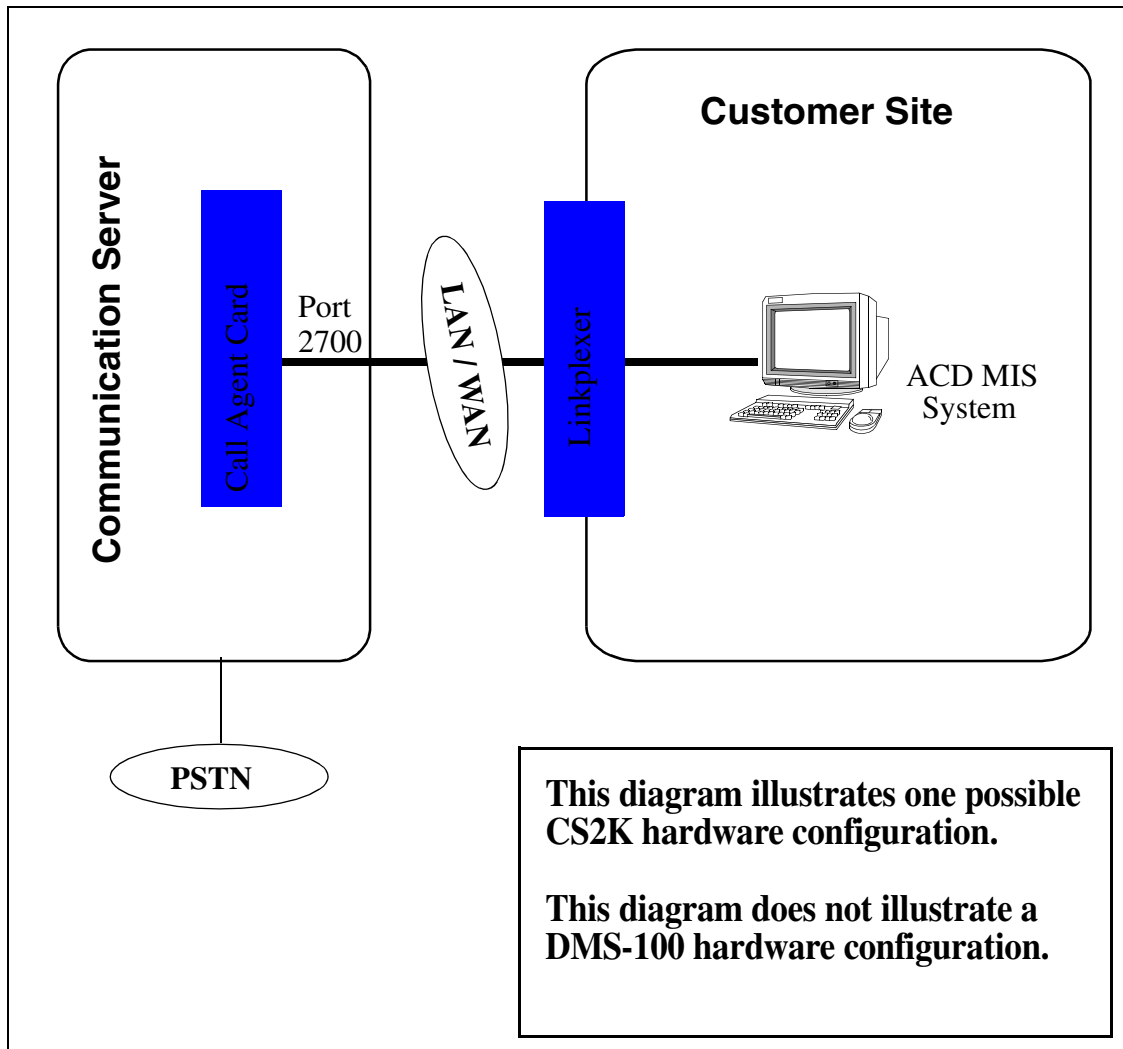
- **Operational Measurements:** There are no functional changes as a result of this feature however, existing ACDMIS OMs will be updated / pegged as necessary.

### 1.2.2 Hardware

The X.25 protocol is currently available on the DMS using the Multi-Protocol Controller (MPC 1X89AA/BA card). The MPC is downloadable input/output device that resides on a DMS I/O Controller (IOC) shelf. The MPC has two programmable data communication links. The MPC accomplishes real time savings in the CM by performing low-level data communications functions.

The TCP/IP transport uses the existing TLI interface to provide connectivity between the DMS-100/CS2K and a DSP. The DMS is provided with Local Area Network (LAN) connectivity by an Ethernet Interface Unit (EIU) or in the case of a CS2KCompact, the Call Agent card. This activity will utilize port 2700 for incoming and outgoing TCP message traffic. Messages originated from the DSP are routed via the network and terminate on the EIU/Call Agent which forwards the messages to the destination port (2700) on the DMS. For some hardware configurations internet routers may be used between the DMS-100/CS2K and DSP.





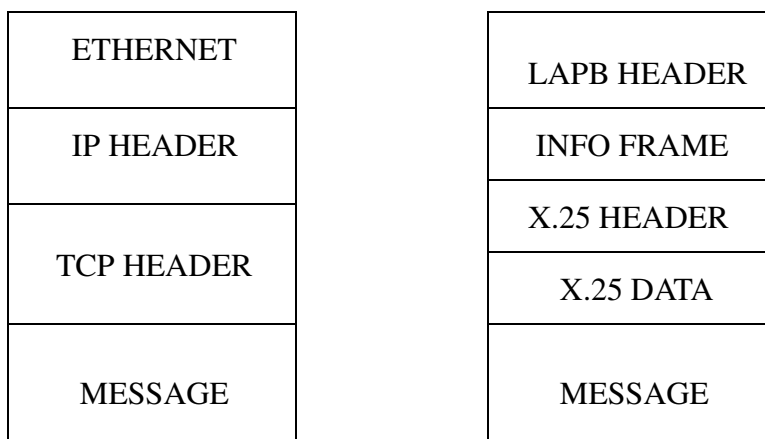
### 1.2.3 Software

This feature enhances existing ACDMIS software to handle the following areas:

- TCP/IP Transport.
- Table Control mechanism to support TCP/IP transport.
- OM's and Logs specific to the TCP/IP transport.

## 1.2.4 TCP/IP Transport

- TCP and X.25 ACD MIS Message Components**



**TCP/IP Message**

**X.25 Message**

- TCP connection checking**

For this feature the ACDMISPL table will be modified to include a LNKSEL type of either X25 or TCP that will be associated with each datafilled pool. The LNKSEL field for a TCP connection will contain a “TCP” designation as well as the remote ACD System’s IP Address, an Alternative ACD System IP Address, a User ID and a Login Password<sup>3</sup>.

Prior to establishing a TCP connection, the DMS-100/CS2K will crosscheck the incoming remote ACD System’s IP address against those IP addresses that are datafilled in the ACDMISPL. The incoming remote ACD System’s IP address must match either the IP Address or Alternative IP Address that is datafilled under the LNKSEL field for a given Pool in table ACDMISPL. Only one ACDMIS link/session is allowed per datafilled Pool.

If the incoming remote ACD System’s IP address is verified the events to establish a TCP connection will proceed, otherwise the connection will not be allowed.

- Establishing a TCP connection**

Establishing the base TCP connection is a function of the existing base TCP/IP layers which will not be impacted by this feature. The following is provided as informational only and not as an indication of the work being done by this feature.

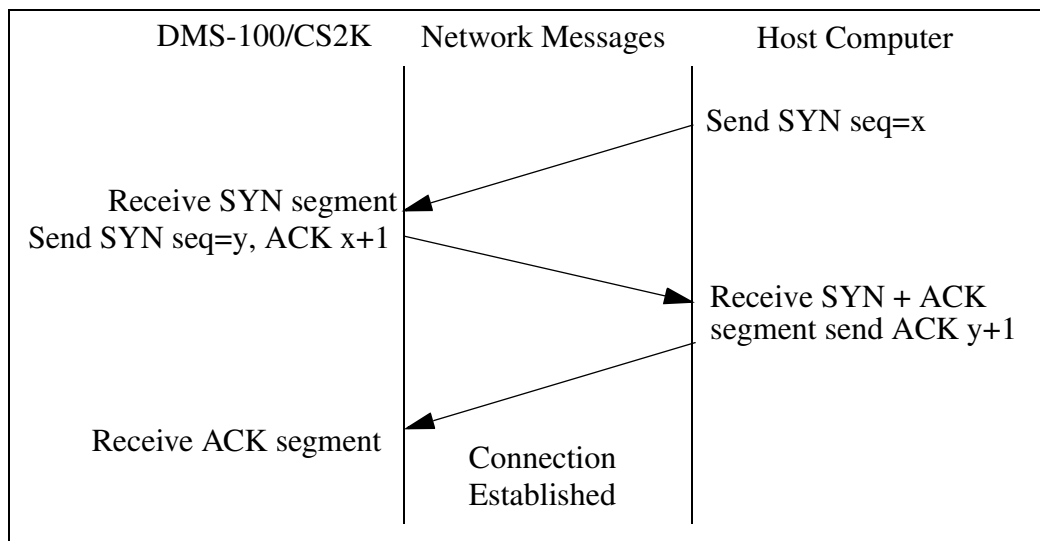
---

3. Please see Section 1.3.5 for details on the table control changes associated with table ACDMISPL.

To establish a connection, TCP uses a three-way handshake. The DMS-100/CS2K will wait passively for the handshake that is initiated by the remote host (DSP) application.

The IP address and the port number of the DMS-100/CS2K will be needed by the remote host application in order to establish a connection. Initially a SYN segment is sent by the host computer application requesting a connection to the DMS-100/CS2K. DMS-100/CS2K will then send an acknowledgment along with the SYN segment to the ACDMIS subscriber to indicate that it is ready to establish a session. The Host computer of the subscriber will then send an acknowledgment. Once the DMS-100/CS2K receives the acknowledgment, the connection is fully established as shown in Figure 1 below.

**Figure 3 Sequence of messages in Three way handshake.**



- **Establishing an ACDMIS Session**

When establishing the ACD MIS Session the remote ACD MIS System must initiate a nosLogon<sup>4</sup> message that is sent to the DMS-100/CS2K.

The nosLogon message contains the following arguments: Protocol Version, Userid, Password and Profile. As a result of this feature it is required that the Userid and Password that is sent in the nosLogon message match the Userid and Password that has been datafilled in table ACDMISPL<sup>5</sup> for a given Pool.

4. Please reference the NT NIS-Q209-2 ACD-MIS Interface Specification for detailed information on the nosLogon message and related arguments.

5. Please see Section 1.3.5 for details on the table control changes associated with table ACDMISPL.

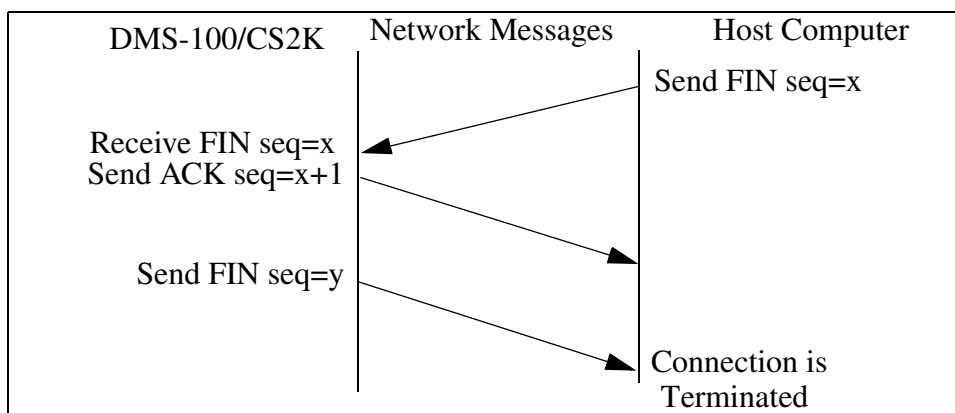
Other standard existing DSP Control messaging i.e. dspAssociatePool, dspRequestInit, dspStartTransfer etc. will be used to establish and setup the ACDMIS Session once the base TCP connection has been made.

- **Terminating TCP connection**

Terminating the base TCP connection is a function of the existing base TCP/IP layers which will not be impacted by this feature. The following is provided as information only and not as an indication of the work being done by this feature.

To close the TCP connection, the remote host application will send the FIN segment as shown in Figure 2. The DMS-100/CS2K acknowledges the FIN segment and acknowledges that no more data is available. Once the connection is closed by the remote host application, TCP refuses to accept more data from the remote host application. The DMS-100/CS2K will then send a FIN segment. When both directions have been closed, the connection is deleted.

**Figure 4 Sequence of messages in terminating a TCP connection**



- **TCP connection Reliability**

TCP connection reliability is a function of the existing base TCP/IP layers which will not be impacted by this feature. The following is provided as information only and not as an indication of the work being done by this feature.

TCP has a “Keep Alive” option consisting of an out-of-band packet which is sent during idle line conditions. This is mainly used to detect any connection failures. The default delay is 45 seconds before the keep alive packet is sent. The keep alive timer value is configurable between 5 to 60 seconds by the user application via the TLI mechanism. An acknowledgment must be received from the peer, or TCP will retransmit the keep alive packet three times with the delay equal to the maximum of



Round trip time-out or 10 seconds. If the peer does not respond, the connection is closed.

### 1.2.5 Table Control Mechanism

The existing ACDMISPL table will be modified to define the relationship between the ACDMIS pool and the transport type, X.25 or TCP/IP. This feature will introduce a new field named LNKSEL to the ACDMISPL table. The new LNKSEL field will be datafillable with either X25 or TCP with the TCP designation having additional refinements of an IP address that refers to the remote DSP, an Alternative IP address for the remote DSP, a UserID and a Password. The newly created LNKSEL field will serve a dual purpose of defining which remote IP addresses are allowed access to the DMS-100/CS2K as well as defining the relationship between the pool and session link.

- ACDMISPL Field Description**

| Field    | New or Changed | Subfield or refinement | Entry                                      | Explanation and action                                                                              |
|----------|----------------|------------------------|--------------------------------------------|-----------------------------------------------------------------------------------------------------|
| POOL     |                | n/a                    |                                            | ACD Pool Name                                                                                       |
| PASSWORD |                | n/a                    |                                            | Pool Password                                                                                       |
| PROTOCOL |                | n/a                    |                                            | ACD MIS Protocol Version                                                                            |
| OUTEVENT |                | n/a                    | 10 to 200                                  | Message Buffers                                                                                     |
| BUNDLING |                | n/a                    | Y or N                                     | Message Bundling                                                                                    |
| LNKSEL   | NEW            | n/a                    | X25 or TCP                                 | Indicates whether this pool will use a X25 or TCP transport.                                        |
| X25      | NEW            | n/a                    | n/a                                        | If X25 is chosen no additional refinements are needed as existing X25 tables and datafill are used. |
| TCP      | NEW            | IP_ADDR                | IP Address                                 | If TCP is chosen an additional refinement is required to indicate the remote systems IP Address.    |
|          | NEW            | ALT_IP_ADDR            | IP Address                                 | Optional refinement to allow an alternative or "back-up" IP Address for the remote system.          |
|          | NEW            | USER_ID                | Alphanumeric<br>>=5 and <= 8<br>Characters | Mandatory refinement which will be used to verify the Userid field of the nosLogon message.         |
|          | NEW            | LOGIN_PASSWD           | Alphanumeric<br>>=5 and <=16<br>Characters | Mandatory refinement which will be used to verify the Password field of the nosLogon message.       |

- ACDMISPL - LNKSEL Field Information**

The TCP refinement to the LNKSEL field allows datafilling of an alternative IP Address (ALT\_IP\_ADDR) to be used as a "back-up".

Historically only one link is allowed per ACD Pool, therefore only one IP Address per ACD Pool is allowed to be active at any given time.

The TCP refinement to the LNKSEL field includes the mandatory refinements USER\_ID and LOGIN\_PASSWD that will be used for login validation in conjunction with the nosLogon message that is sent by the DSP.

LNKSEL field datafill changes from X25 to TCP/IP or TCP/IP to X25 will require the ACDMIS link to be brought down and may require datafill changes to other X25 related tables as needed.

- **ACDMISPL Table Enhancement Example**

TABLE: ACDMISPL

| POOL   | PASS   | PROTOCOL | OUTEVENT | BUND | LNKSEL                   |
|--------|--------|----------|----------|------|--------------------------|
| POOL01 | POOL01 | BCS43    | 110      | N    | X25                      |
| POOL02 | POOL02 | BCS43    | 110      | N    | TCP 47 245 5 247 246 6 3 |

- **ACDMISPL Datafill Example for TCP Transport**

```

POOL:
>ACDPOOL
PASSWORD:
>PASSWD1
PROTOCOL:
>BCS35
OUTEVENT: 200
>110
BUNDLING:
>N
LNKSEL:
>TCP
IP_ADDR:
>47 245 5 2
ALT_IP_ADDR:
>47 246 6 3
USER_ID:
>USER2
LOGIN_PASSWD:
>PASS2

```

```

TUPLE TO BE ADDED:
ACDPOOL PASSWD1 BCS35 110 N TCP 47 245 5 2 47 246 6 3 USER2 PASS2
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

- **ACDMISPL Datafill Example for X25 Transport**

```

POOL:
>ACDPOOL
PASSWORD:
>PASSWD1
PROTOCOL:
>BCS35
OUTEVENT: 200
>110
BUNDLING:
>N

```

```
LNKSEL:
>X25

TUPLE TO BE ADDED:
  ACDPOOL  PASSWD1  BCS35  110 N  X25
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.
```

## 1.2.6 Operational Measurements

This feature makes no functional changes to ACD MIS OM's, however the ACD MIS related OM's as described below will be updated / pegged as necessary using the new TCP transport.

### 1.2.6.1 ACDMISPL - OM Group

The ACDMISPL OM Group will not be impacted by this feature. The following is provided as information only and not as an indication of the work being done by this feature.

- The OM group ACDMISPL monitors the ACD MIS output message buffer and provides buffer usage and peg count registers for messages lost or transmitted. The following is a brief description of the ACDMISPL OM registers:
- **MISLOST**: Pegs the number of valid MIS event messages that fail to enter the outgoing message buffer because the buffer is full. The message is subsequently discarded and no retransmission is attempted and further buffering is offered.
- **MISQUSAG**: Records the number of messages waiting to be transmitted in the outgoing message buffer every 100 seconds. Under normal traffic conditions, MISQUSAG should be zero since all messages are dispatched as soon as they enter the outgoing message buffer.
- **MISTRANS**: Pegs the number of valid outgoing messages that are transferred successfully to the MIS downstream processor via the X.25 data link through the MPC/EMPC card. The register counts each call event, return\_result, or initialization message that is transmitted.

## 1.3 Software Requirements or Dependencies

Not Applicable

## 1.4 Limitations and restrictions

- Maximum number of TCP/IP connections to a single DMS-100/CS2K is 96.
- The number of ACDMIS TCP/IP Links per single DMS-100/CS2K will be limited to 60.

## 1.5 Interactions

Not Applicable

## 1.6 Applicable customer facing sections

### Fault Management

Logs \_\_N/A\_\_

Alarms \_\_N/A\_\_

### Configuration

Data Schema \_\_ X \_\_

User Interface \_\_N/A\_\_

Element Management \_\_N/A\_\_

Security \_\_N/A\_\_

Service Order \_\_N/A\_\_

Office Parameters \_\_N/A\_\_

Accounting (includes AMA billing) \_\_N/A\_\_

Performance (includes operational measurements) \_\_N/A\_\_

## 1.7 Glossary

| Term | Description                   |
|------|-------------------------------|
| 3PC  | Third Party Core              |
| ACD  | Automatic Call Distribution   |
| CS2K | Communication Server 2000     |
| DMS  | Digital Multiplex System      |
| DSP  | Down Stream Processor         |
| EIU  | Ethernet Interface Unit       |
| IOC  | Input-Output Controller       |
| IP   | Internet Protocol             |
| MIS  | Management Information System |
| MPC  | Multi-Protocol Controller     |
| OM   | Operational Measurements      |
| TCP  | Transmission Control Protocol |
| TLI  | Transport Layer Interface     |

## **2: Configuration for A00007250**

### **2.1 Hardware and Software Requirements**

This feature will use the existing TLI interface to provide connectivity between the DMS-100/CS2K and a DSP. The DMS -100/CS2K is provided with Local Area Network (LAN) connectivity by an Ethernet Interface Unit (EIU) or in the case of a CS2KCompact, the 3PC card. The basic ACD software package is needed to use this feature.

### **2.2 Initial Configuration**

The configuration for this feature is detailed in the DS section of this document.

### **2.3 Office/Subnet parameters (OP/SP) (CM & SESM)**

N/A

### **2.4 Upgrade Considerations**

#### **2.4.1 Dump and Restore (CM)**

No manual action is required. A reformat Procedure will be used as the software solution.

ONP reformat procedures will be written to default the LNKSEL field of table ACDMISPL to X25 as required. Transport datafill changes from X25 to TCP/IP or TCP/IP to X25 may require the ACDMIS link to be brought down and may require datafill changes to existing X25 related tables.

#### **2.4.2 Element Management Upgrade**

N/A

#### **2.4.3 Downgrade impact**

N/A

### **2.5 Data schema (DS) (CM, MIBS, RDB)**

#### **2.5.1 New/modified tables, MIBs, or Database Schema**

The existing ACDMISPL table will be modified to define the relationship between the ACDMIS pool and the transport type, X.25 or TCP/IP. This feature will introduce a new field named LNKSEL to the ACDMISPL table. The new LNKSEL field will be datafillable with either X25 or TCP with the TCP designation having additional refinements of an IP address that refers to the remote DSP, an Alternative IP address for the remote DSP, a UserID and a Password. The newly created LNKSEL field will serve a dual purpose of defining which remote IP addresses are allowed access to the DMS-100/CS2K

as well as defining the relationship between the pool and session link.  
Impacted tables are listed below in Table 1

**Table 1 New or modified tables**

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------|--------------------------|------------------------------------|
| ACDMISPL       | CHANGED                  | UNCHANGED                          |

### 2.5.1.1 Fields/OIDs

The following table lists fields/OIDs for ACDMISPL

**Table 2 Table field descriptions**

| Field    | New or Changed | Subfield or refinement | Entry                                   | Explanation and action                                                                              |
|----------|----------------|------------------------|-----------------------------------------|-----------------------------------------------------------------------------------------------------|
| POOL     |                | n/a                    |                                         | ACD Pool Name                                                                                       |
| PASSWORD |                | n/a                    |                                         | Pool Password                                                                                       |
| PROTOCOL |                | n/a                    |                                         | ACD MIS Protocol Version                                                                            |
| OUTEVENT |                | n/a                    | 10 to 200                               | Message Buffers                                                                                     |
| BUNDLING |                | n/a                    | Y or N                                  | Message Bundling                                                                                    |
| LNKSEL   | NEW            | n/a                    | X25 or TCP                              | Indicates whether this pool will use a X25 or TCP transport.                                        |
| X25      | NEW            | n/a                    | n/a                                     | If X25 is chosen no additional refinements are needed as existing X25 tables and datafill are used. |
| TCP      | NEW            | IP_ADDR                | IP Address                              | If TCP is chosen an additional refinement is required to indicate the remote systems IP Address.    |
|          | NEW            | ALT_IP_ADDR            | IP Address                              | Optional refinement to allow an alternative or "back-up" IP Address for the remote system.          |
|          | NEW            | USER_ID                | Alphanumeric<br>>=5 and <= 8 Characters | Mandatory refinement which will be used to verify the Userid field of the nosLogon message.         |
|          | NEW            | LOGIN_PASSWD           | Alphanumeric<br>>=5 and <=16 Characters | Mandatory refinement which will be used to verify the Password field of the nosLogon message.       |

### 2.5.1.2 Datafill example

- ACDMISPL Datafill Example for TCP Transport**

```
POOL:
>ACDPOOL
PASSWORD:
>PASSWD1
PROTOCOL:
>BCS35
```

```

OUTEVENT: 200
>110
BUNDLING:
>N
LNKSEL:
>TCP
IP_ADDR:
>47 245 5 2
ALT_IP_ADDR:
>47 246 6 3
USER_ID:
>USER2
LOGIN_PASSWD:
>PASS2

TUPLE TO BE ADDED:
ACDPOOL PASSWD1 BCS35 110 N TCP 47 245 5 2 47 246 6 3 USER2 PASS2
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

- **ACDMISPL Datafill Example for X25 Transport**

```

POOL:
>ACDPOOL
PASSWORD:
>PASSWD1
PROTOCOL:
>BCS35
OUTEVENT: 200
>110
BUNDLING:
>N
LNKSEL:
>X25

TUPLE TO BE ADDED:
ACDPOOL PASSWD1 BCS35 110 N X25
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT.

```

- **Example of ACDMISPL table**

```

TABLE: ACDMISPL

POOL  PASS  PROTOCOL  OUTEVENT  BUND  LNKSEL
-----
POOL01 POOL01 BCS43    110      N    X25
POOL02 POOL02 BCS43    110      N    TCP 47 245 5 2 47 246 6 3 USER2 PASS2

```

### 2.5.1.3 Supplementary information

Any changes to existing tuples in the ACDMISPL table will require the ACD MIS LINK to be brought down if there is an active session on the Pool/tuple being changed. If there is not an active session on the Pool/tuple being changed, then changes are allowed.

In addition to the above restriction, changes in the LNKSEL field from TCP to X25 will require the standard X25 datafill that has always been used when establishing a ACD MIS X.25 Link, which will involve changes/additions to table datafill in table MPCLINK.

**2.5.1.4 Translation verification and other tools**

N/A

**2.6 Service Orders (SO) (CM & SESM)**

There are no SERVORD impacts for this feature.

**2.7 Software optionality control (SOC)**

There is no SOC interaction with this feature.

**2.8 Element Management**

Not applicable

**2.9 User interface changes**

Not applicable

**2.10 OSSGate Interface Changes**

Not applicable

**2.11 Security**

Not applicable

**2.12 Configuration Walkthrough**

Not applicable

***Product = CS 2000*****A00007268--NGSS OM Subsystem Enhancement*****Functional Description*****1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

**1.2 Description**

In SN07 Release, NGSS OM subsystem pegs counts for one set of registers per OM group.

OM enhancement activity is to enhance the existing OM subsystem to support the notion of dynamic number of tuples for OM groups, i.e. tuples can be added to or deleted from OM groups dynamically.



The SIP Gateway OM groups defined in SN07 (SIPGW\_CALLP, SIPGW\_SERVICES and SIPGW\_MISC) are enhanced to track measurements based on SIPLINK.

OM CLI (i.e. **OM SHOW**) is enhanced to support querying of OM peg counts based on TUPLES.

The omshow command syntax at the CLI will be as follows:

```
>omshow <groupname>
      <class> {ACTIVE,
              HOLDING,
              FIVEMIN,
              ZERO}
      [<num> {0 to 4294967295}]]
      [<to_num> {0 to 4294967295}]
      [<Key> string]
      [<Key to> string]
```

The first parameter will be the **OM Group Name**, the second parameter will be the **Query Type** (ACTIVE/HOLDING/LAST5MIN).

*Note 1: “ALL”* is no longer supported for the groupname parameter.

*Note 2: Tuple key* will be a mandatory integer key provided by application that wants to peg OMs, with an optional text keyname (if provided must be unique).

*Note 3: Tuple Key Range:-* The max tuple key range is calculated as “4294967295” by applying the formula “ $2^{32}-1$ ”.

## 1.3 Hardware Requirements or Dependencies

None.

## 1.4 Software Requirements or Dependencies

None.

## 1.5 Limitations and restrictions

None.

## 1.6 Interactions

None.

## 1.7 Applicable customer facing sections

Fault Management

|                                                 |         |
|-------------------------------------------------|---------|
| Logs                                            | __N/A__ |
| Alarms                                          | __N/A__ |
| Configuration                                   |         |
| Data Schema                                     | __N/A__ |
| User Interface                                  | __N/A__ |
| Element Management                              | __N/A__ |
| Security                                        | __N/A__ |
| Service Order                                   | __N/A__ |
| Office Parameters                               | __N/A__ |
| Accounting (includes AMA billing)               | __N/A__ |
| Performance (includes operational measurements) | __N/A__ |

## 1.8 Glossary

| Term | Description                    |
|------|--------------------------------|
| OM   | Operational Measurement        |
| NGSS | Next Generation Session Server |
| CLI  | Command Line Interface         |

## 1.9 Appendix A: NGSS OM CSV File Format

This section details the CSV file formats, its location, and shows examples.

### 1.9.1 CSV File Location

#### SSH Login Access

If the user desires to login to a session server unit via an account such as MTC and look at the CSV files, the main directory path is /opt/apps/ngsspm. Two subdirectories are located here:

stdhist - This directory contains the 24 hour long term values.

trafhist - This directory contains the 30 minute short term values.

#### FTP Access

This future section will contain the access information when FTP is utilized using the NGSSPM account to pull CSV files from a session server unit.

## 1.9.2 CSV File Format

The CSV file format is shown below. Note that the below format uses an example consisting of two OM groups. The first example OM group has 32 registers and 1 tuple of peg counts. The second example OM group has 9 registers and 3 tuples of peg counts.

```
PMFile=Begin
MeasurementCategory,FileCreationTime,EarliestStartTime,LatestCaptureTime,RegisterTypeDefault,ValueTypeDefault
t
<string="pm">,<string>,<string>,<string>,<string="counter">,<string="integer">
System=Begin
SystemId
<string="SessionServer">
Entity=Begin
EntityId
<string= Unit IPAddress>
SubEntity=Begin
SubEntityId
<string=["Unit0" | "Unit1"]>
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime,Reliability
<string>,<string="PeriodBased">,<string>,<integer>,<string="Valid">
Labels=Begin
TupleKey,KeyName
<string>,<string>
Reg1Name,Reg2Name,Reg3Name,Reg4Name
<string>,<string>,<string>,<string>
Reg5Name,Reg6Name,Reg7Name,Reg8Name
<string>,<string>,<string>,<string>
Reg9Name,Reg10Name,Reg11Name,Reg12Name
<string>,<string>,<string>,<string>
Reg13Name,Reg14Name,Reg15Name,Reg16Name
<string>,<string>,<string>,<string>
Reg17Name,Reg18Name,Reg19Name,Reg20Name
<string>,<string>,<string>,<string>
Reg21Name,Reg22Name,Reg23Name,Reg24Name
<string>,<string>,<string>,<string>
Reg25Name,Reg26Name,Reg27Name,Reg28Name
<string>,<string>,<string>,<string>
Reg29Name,Reg30Name,Reg31Name,Reg32Name
<string>,<string>,<string>,<string>
Labels=End
RowOfValues=Begin
TupleKey,KeyName
<integer>,<string>
Reg1Value,Reg2Value,Reg3Value,Reg4Value,Reg5Value,Reg6Value,Reg7Value,Reg8Value
<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>
Reg9Value,Reg10Value,Reg11Value,Reg12Value,Reg13Value,Reg14Value,Reg15Value,Reg16Value
<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>
Reg17Value,Reg18Value,Reg19Value,Reg20Value,Reg21Value,Reg22Value,Reg23Value,Reg24Value
<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>
Reg25Value,Reg26Value,Reg27Value,Reg28Value,Reg29Value,Reg30Value,Reg31Value,Reg32Value
<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>
RowOfValues=End
Table=End
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime,Reliability
<string>,<string="PeriodBased">,<string>,<integer>,<string="Valid">
Labels=Begin
TupleKey,KeyName
<string>,<string>
Reg1Name,Reg2Name,Reg3Name,Reg4Name
<string>,<string>,<string>,<string>
Reg5Name,Reg6Name,Reg7Name,Reg8Name
<string>,<string>,<string>,<string>
Reg9Name
<string>
Labels=End
RowOfValues=Begin
TupleKey,KeyName
<integer>,<string>
Reg1Value,Reg2Value,Reg3Value,Reg4Value,Reg5Value,Reg6Value,Reg7Value,Reg8Value
<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>
Reg9Value
<integer>
TupleKey,KeyName
<integer>,<string>
Reg1Value,Reg2Value,Reg3Value,Reg4Value,Reg5Value,Reg6Value,Reg7Value,Reg8Value
<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>,<integer>
Reg9Value
<integer>
```

```

TupleKey, KeyName
<integer>, <string>
Reg1Value, Reg2Value, Reg3Value, Reg4Value, Reg5Value, Reg6Value, Reg7Value, Reg8Value
<integer>, <integer>, <integer>, <integer>, <integer>, <integer>, <integer>, <integer>
Reg9Value
<integer>
RowOfValues=End
Table=End
SubEntity=End
Entity=End
System=End
PMFile=End

```

### 1.9.3 Examples

An example CSV file is shown below. Note that the below example shows three OM groups. The first OM group has 6 registers, the second has 10 registers and the third has 5 registers. All of the sample OM groups have 2 tuples of peg counts.

```

PMFile=Begin
MeasurementCategory, FileCreationTime, EarliestStartTime, LatestCaptureTime, RegisterTypeDefault, ValueTypeDefault
pm, 2004.8.30_15.25_EDT, unknown, unknown, counter, integer
System=Begin
SystemId
SessionServer
Entity=Begin
EntityId
47.174.74.179
SubEntity=Begin
SubEntityId
Unit0
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime, Reliability
SIPGW_CALLP, PeriodBased, 5, unknown, Valid
Labels=Begin
TupleKey, KeyName
Key, KeyName
Reg1Name, Reg2Name, Reg3Name, Reg4Name
IC_CALL_ATTEMPTS, OG_CALL_ATTEMPTS, CALLS_ABANDONED, CALLS_ANSWERED
Reg5Name, Reg6Name
CALLS_REJECTED, CALLS_REDIRECTED
Labels=End
RowOfValues=Begin
TupleKey, KeyName
0, SIPLINK_0
Reg1Value, Reg2Value, Reg3Value, Reg4Value, Reg5Value, Reg6Value
2, 1, 0, 0, 1, 0
TupleKey, KeyName
1, SIPLINK_1
Reg1Value, Reg2Value, Reg3Value, Reg4Value, Reg5Value, Reg6Value
0, 1, 0, 1, 0, 5
RowOfValues=End
Table=End
Table=Begin
TableId, MeasurementKind, IntervalDuration, CaptureTime, Reliability
SIPGW_SERVICES, PeriodBased, 5, unknown, Valid
Labels=Begin
TupleKey, KeyName
Key, KeyName
Reg1Name, Reg2Name, Reg3Name, Reg4Name
REFER_ATTEMPTS, REFER_SUCCESS, IC_DTMF_SUBSCRIBES, OG_DTMF_SUBSCRIBES
Reg5Name, Reg6Name, Reg7Name, Reg8Name
IC_DTMF_NOTIFYS, OG_DTMF_NOTIFYS, IC_FAX_SUBSCRIBES, OG_FAX_SUBSCRIBES
Reg9Name, Reg10Name
IC_FAX_NOTIFYS, OG_FAX_NOTIFYS
Labels=End
RowOfValues=Begin
TupleKey, KeyName
0, SIPLINK_0
Reg1Value, Reg2Value, Reg3Value, Reg4Value, Reg5Value, Reg6Value, Reg7Value, Reg8Value
2, 1, 0, 0, 1, 0, 1, 3
Reg9Value, Reg10Value
2, 0
TupleKey, KeyName
1, SIPLINK_1
Reg1Value, Reg2Value, Reg3Value, Reg4Value, Reg5Value, Reg6Value, Reg7Value, Reg8Value
3, 0, 1, 0, 1, 0, 2, 0
Reg9Value, Reg10Value

```

```

1,1
RowOfValues=End
Table=End
Table=Begin
TableId,MeasurementKind,IntervalDuration,CaptureTime,Reliability
SIPGW_MISC,PeriodBased,5,unknown,Valid
Labels=Begin
TupleKey,KeyName
Key, KeyName
Reg1Name,Reg2Name,Reg3Name,Reg4Name
TCP_CALLS,UDP_CALLS,SIP_MSG_SEND_FAILURES,INCOMING_SDP_INCOMPATIBLE
Reg5Name
OUTGOING_SDP_INCOMPATIBLE
Labels=End
RowOfValues=Begin
TupleKey,KeyName
0,SIPLINK_0
Reg1Value,Reg2Value,Reg3Value,Reg4Value,Reg5Value
3,0,1,0,1
TupleKey,KeyName
1,SIPLINK_1
Reg1Value,Reg2Value,Reg3Value,Reg4Value,Reg5Value
4,1,1,1,0
RowOfValues=End
Table=End
SubEntity=End
Entity=End
System=End
PMFile=End

```

## ***Product = CS 2000***

### **A00007270--Session Server Call Processing Overload Controls** ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

#### **1.2 Description**

This feature provides for Overload Controls on the Session Server for the SIP Gateway Call Processing Application.

The Session Server is a platform for delivery of multiple applications. It consists of a NEBS Level 3 compliant hardware platform and a software framework and architecture for developing Carrier Grade applications and services. The SIP Gateway Application is the initial application for the Session Server Platform

The new functionality that will be implemented under this Session Server Overload Controls activity consists of the overload controls mechanism created specifically for Call Processing on the SIP Gateway Application.

##### **1.2.1 SIP CallP Gateway Application Overload Controls**

For SIP Gateway Application's overload monitoring purposes, Queue Monitor Thread will be monitoring the size of the Call Processing Origination Queue

to make the determination on call processing capacity and thus overload state. The overload state thresholds will be pre-defined and thus not provisionable. It is not in the scope of this feature to provide an interface to allow for provisioning of threshold values.

The overload thresholds are as follows:

- Overload will be triggered for UDP traffic over 1.170 M BHCCA
- Pending Overload will be triggered for UDP traffic over 1.080 M BHCCA

In the event that Queue Monitor has indicated that a Call Processing Origination Queue overload condition exists, Sip Gateway Application will discard any new origination (INVITE) messages coming in from remote SIP servers. Outgoing origination messages will continue to be processed as received. Logs and Alarms will be raised to indicate a problem. A new OM register (OVRD\_CALLS\_REJECTED) in the SIPGW\_CALLP group will be pegged every time an INVITE is rejected due to an overload condition. Logs and alarms are defined in section 11 of this document. The OM register is discussed in section 14 of this document

Following are the Overload States and the corresponding actions:

- Overload - Logs and major Alarms are raised and action taken to stabilize the system by rejecting new incoming origination messages. OVRD\_CALLS\_REJECTED OM register is pegged
- Overload Pending - Logs and minor Alarms raised, but no action taken to reject CallP messages.
- No Overload - All prior Alarms cleared.

### **1.3 Hardware Requirements or Dependencies**

This feature doesn't introduce any new hardware requirements or dependencies.

### **1.4 Software Requirements or Dependencies**

This feature doesn't introduce any new software requirements or dependencies.

### **1.5 Limitations and restrictions**

This feature will not provide an user interface for provisioning the Overload Threshold values.

In the event of a Call Processing Origination Queue overload condition, ONLY new origination messages coming in from remote SIP servers will be discarded. The processing of the outgoing calls will not be affected. The reason behind this restriction is that on the outgoing calls, the call processing has already been completed on the XA-core and on the SIPT GWC, and the

therefore these calls have passed the point of alternate disposition (such as alternate route or treatment).

## 1.6 Interactions

This feature implements a Session Server Overload Manager process, which is designed to interact with SIP CallP Gateway Application and other “future” applications on the Session Server.

## 1.7 Glossary

| Term           | Description                              |
|----------------|------------------------------------------|
| CallP          | Call Processing                          |
| GWC            | Gateway Controller                       |
| NEBS           | Network Equipment Building System        |
| Session Server | Platform for the SIP Gateway Application |
| SIP            | Session Initiated Protocol               |

## 2.1 Fault Management for A00007270

### 2.2 Overload Controls Logs and Alarms

The following is a description of logs and alarms that are generated by the SIP Gateway Call Processing Application in regards to the Overload Controls Feature. These logs and Alarms can be viewed via the SIP Gateway Maintenance web browser interface on the Session Server Manger - SIP Gateway application web page.

Note that these logs and alarms are only generated and reported on the SIP Gateway Application.

#### 2.2.1 SIP Gateway Call Processing Application Logs

Following are the two customer logs that will be generated by this feature:

- SIPC310 - SIP CallP Overload Threshold Reached
- SIPC310 - SIP CallP Overload Cleared

##### 2.2.1.1 SIPC310 SIP CallP Overload Threshold Reached

Log SIPC310 “SIP CallP Overload Threshold Reached” is associated with the generation of the Major alarm due to reaching a predefined threshold in call processing capacity.

Log Title: SIP CallP

Name: SIPC310

Description: Overload Threshold Reached

Event Type: Trouble

**FORMAT:** For the SIPC310 log, the following are values/explanations of the variable values:

- alarmLevel = MAJ/MIN- Indicates a major alarm
- componentID = SIPC
- category = Communications
- description = Overload Threshold Reached
- probable cause = System overloaded
- specific cause =
- correlationIdList = None
- neVendorSpecificInfo = None
- technologySpecificInfo = None
- reportName = SIPC
- reportNum= 310
- eventType = TBL
- label = SIP CallP

**ACTION:** Monitor the network

#### 2.2.1.2 SIPC310 SIP CallP Overload Cleared

Log SIPC310 “SIP CallP Overload Cleared” is generated when SIP Gateway Application is no longer in Overload.

Log Title: SIP CallP

Name: SIPC310

Description: Overload Cleared

Event Type: Trouble

**FORMAT:** For the SIPC310 log, the following are values/explanations of the variable values:

- alarmLevel = None
- componentID = SIPC
- category = Communications
- description = Overload Threshold Cleared



- probable cause =
- specific cause =
- correlationIdList = None
- neVendorSpecificInfo = None
- technologySpecificInfo = None
- reportName = SIPC
- reportNum= 310
- eventType = TBL
- label = SIP CallP

**ACTION:** None

### **3.1 Performance Management for A00007270**

#### **3.2 Performance management strategy**

New Operational Measurement Register will added under this activity and be pegged to generate the performance history.

#### **3.3 Performance management tools and utilities**

The OMSHOW command will be used to display the OM statistics on the Session Server.

#### **3.4 Performance Measurements (PM), Operational Measurements (OM), and stats**

This activity adds a new register (OVRD\_CALLS\_REJECTED) to the SIPGW\_CALLP om group in order to track the number of incoming calls that are rejected due to SIP Callp being in overload.

##### **3.4.1 OM Group SIPGW\_CALLP**

###### **3.4.1.1 OM Description**

SIPGW\_CALLP OM Group is used to track the performance statistics of the SIP Gateway Callp Application on the Session Server.

###### **3.4.1.2 Release history update**

In this release a new Register (OVRD\_CALLS\_REJECTED) is added to this OM Group.

###### **3.4.1.3 Registers**

SIPGWY\_CALLP OM group registers display on the MAP terminal as follows:

OMGROUP: SIPGW\_CALLP

\*\*\*\*\*

TUPLE KEY: 1 TUPLE KEY NAME: SIP\_TO\_NGSS

| Register Name       | Value |
|---------------------|-------|
| -----               | ----- |
| IC_CALL_ATTEMPTS    | 0     |
| OG_CALL_ATTEMPTS    | 0     |
| CALLS_ABANDONED     | 0     |
| CALLS_ANSWERED      | 0     |
| CALLS_REJECTED      | 0     |
| CALLS_REDIRECTED    | 0     |
| OVRD_CALLS_REJECTED | 0     |

\*\*\*\*\*

**3.4.1.4 Associated OM groups**

None

**3.4.1.5 Associated functional groups**

None

**3.4.1.6 Associated functionality codes**

Not Applicable

**3.4.1.7 OM group registers logic flow chart**

When the SIP Gateway Application Callp is deemed to be in overload, all incoming INVITE requests are rejected and the OVRD\_CALLS\_REJECTED register is pegged.

**3.4.2 Register OVRD\_CALLS\_REJECTED**

This register represents how many incoming INVITE requests have been rejected due to the SIP Gateway Callp being in Overload.

**3.4.2.1 Register release history update**

New in this release

**3.4.2.2 Associated registers**

None

**3.4.2.3 Associated logs**

SIPC310 MAJOR TBL SIP Callp NCGL=RTP7-UNIT1;Unit=1;SIPC  
Overload Threshold Reached

## **A00007275--Session Server - Session/Application Mgmt Framework and Support for Multiple HTTPS connection to the Session Server through SSPFS**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

#### **1.2 Description**

##### **1.2.1 Session Server - Session/Application Mgmt Framework and Support**

This feature is one of three features whose primary requirements are to provide thread trap recovery as well as overload controls for the (SIP) Gateway Application.

The other features are:

- A00007270 - Session Server - Overload Controls
- A00007276 - Session Server - Application Patching Support

This feature implements light-weight thread-safe message queues for communicating between SIP Gateway Application threads, replacing the Unix Sockets and Inter-Process Communication (IPC) Message Queues used in Session Server Release 07. These new Message Queues provides the framework to make thread recovery and overload controls possible.

This feature introduces software into the SIP Gateway Application which monitors the health of the SIP Gateway Application threads and will attempt to recover any threads that fail rather than choosing to Swact the platform as the first course of action. Of course, if the thread cannot be recovered, the platform will Swact.

##### **1.2.2 Support for Multiple HTTPS connection to the Session Server through SSPFS**

Refer to PLS FMDOC A00008383 for more information on this activity. This feature removes the limitation of one proxy HTTPS connection from IEMS/SSPFS to the Session Server and allows multiple Session Server nodes to reside on the CS-LAN. Multiple Session Servers may be required to allow multiple applications to be deployed on separate boxes or to allow multiple Session Servers running the same application or combinations of both. For the SN08 release, the expected number of Session Servers to be provision on the SSPFS is aimed at 4.

At customer sites, the SSPFS acts as an HTTP proxy between the OAMP and CALLP LANS (which are separated by a firewall). Incoming requests to the SSPFS from the Session Server web provisioning interface are mapped to tag names which are in turn mapped to real URLs in the CALLP LAN to get the request to the correct Session Server box. Tomcat requires that the tag names in the SSPFS must be the same string as the last directory in the destination URL. The destination URLs for the Session Server application's web page is hard-coded to be in the '/prov' directory and therefore the SSPFS must use a tag name of 'prov' to map the HTTPS request to the Session Server. Since tag names must be unique, the SSPFS can only direct HTTPS requests to a single Session Server box in SN07.

This feature provides the support of different tag names in the SSPFS to support multiple HTTPS connections so that the Session Server application web page will end in a variable directory name that is configured at startup. Once the hard-coded use of '/prov' is removed and replaced with the configured string, multiple HTTPS connections through the SSPFS will be possible.

The variable tag name for the Session Server applications will be obtained when the applications are installed. All Session Server applications are installed through the InstallApps script which is run after NCGL is installed. The script will prompt for a new tag name for the Session Server box. The same name must be input on both the active and inactive Session Server application during installation as well as on the SSPFS Apache proxy configuration to identify the said Session Server Application. The tagname is an alphanumeric string with period, underscore or hyphen and a maximum string length of 128 characters.

An example of how the 2 Session server applications will be configured on the Apache proxy configuration is as follows:

The tag name for this Session Server is "**ngss-spc**"

*ProxyPass /10.65.99.67/ https://10.65.99.67:443/ ---> NCGL unit 0*

*ProxyPassReverse /10.65.99.67/ https://10.65.99.67:443/*

*ProxyPass /10.65.99.70/ https://10.65.99.70:443/ ---> NCGL Unit 1*

*ProxyPassReverse /10.65.99.70/ https://10.65.99.70:443/*

*ProxyPass /10.65.99.72/ https://10.65.99.72:443/ ---> NCGL active*

*ProxyPassReverse /10.65.99.72/ https://10.65.99.72:443/*

*ProxyPass /ngss-spc/ https://10.67.99.72:8443/ngss-spc/ ---> NGSS Active*

*ProxyPassReverse /ngss-spc/ https://10.67.99.72:8443/ngss-spc/*

The tag name for this NGSS is “**ngss-trkapp**”

*ProxyPass /172.65.99.67/ https://172.65.99.67:443/ ---> NCGL unit 0*

*ProxyPassReverse /172.65.99.67/ https://172.65.99.67:443/*

*ProxyPass /172.65.99.70/ https://172.65.99.70:443/ ---> NCGL Unit 1*

*ProxyPassReverse /172.65.99.70/ https://172.65.99.70:443/*

*ProxyPass /172.65.99.72/ https://172.65.99.72:443/ ---> NCGL active*

*ProxyPassReverse /172.65.99.72/ https://172.65.99.72:443/*

*ProxyPass /ngss-trkapp/ https://172.67.99.72:8443/ngss-trkapp/ --> NGSS Active*

*ProxyPassReverse /ngss-trkapp/ https://172.67.99.72:8443/ngss-trkapp/*

### 1.3 Hardware Requirements or Dependencies

This feature doesn't introduce any new hardware requirements or dependencies.

### 1.4 Software Requirements or Dependencies

This feature doesn't introduce any new software requirements or dependencies.

The IEMS software has to be SN08 or greater release for multiple HTTPS support on the Session Server through the SSPFS.

### 1.5 Limitations and restrictions

The key assumption for the multiple HTTPS support of the Session Server through the NGSS activity is that the Session Server will continue to use a single launch point for accessing OAMP pages for all applications. This was the planned approach for all applications and should be an accurate assumption. If future applications do not choose to use that single launch point for their OAMP, additional feature work will be required to support additional dynamic tag names for those applications that do not conform.

The tag name for an Session Server application must be unique and cannot be change once the application is installed using the InstallApps script. Any change of the tag name will require a re-installation of the application.

## 1.6 Interactions

This activity interacts with the SSPFS. The tag name that is input into the NGSS during installation for both the active and inactive units, have to match what is input into the SSPFS.

## 1.7 Glossary

| Term  | Description                                           |
|-------|-------------------------------------------------------|
| HTTPS | HyperText Transport Protocol Secure                   |
| IEMS  | Integrated Element Management System                  |
| IPC   | Inter-Process Communication                           |
| NCGL  | Nortel Carrier Grade Linux                            |
| NGSS  | Next Generation Session Server                        |
| OAMP  | Operation Administration Maintenance and Provisioning |
| SSPFS | Succession Server Platform Foundation Software        |
| URL   | Uniform Resource Locator                              |

***Product = CS 2000***

## **A00007277--LOGs Throttling**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS

#### **1.2 Description**

This feature is required to implement LOGs throttling functionality for XA-Core.

The requirement of this feature is to use a datafill table for throttling logs. Customer can throttle the log report by specifying the time unit and threshold value.

There is also a requirement to throttle the DLOG when it is specified by the customer. By default throttled logs will go to DLOG, unless it is specified by the user.

Only core logs will be throttled.

Desired behavior of this feature is to implement the throttling mechanism for LOG Devices and DLOGs. New throttling functionality will allow customer to specify on Time Units and Thresholds per Report Name (REPNAME) through a Table LOGTHROT.

New threshold behavior:

- Logs to be throttled, will be output in each unit time until the log count reaches threshold value.
- Logs will then be throttled until the time unit expires.
- When the timer resets the logs will not be throttled.

The new Table LOGTHROT will contain the THRSHOLD and TUNITS values as we have them in table LOGCLASS.

**Figure 1 Functional Diagram**

| TABLE LOGTHROT: |          |           |       |
|-----------------|----------|-----------|-------|
| REPNAME         | THRSHOLD | TUNITS    | DLOG  |
| -----           |          |           |       |
| TRK 113         | [0-255]  | [0-32767] | Y / N |

Logs will be generated in each time unit until the log count reaches the threshold value. The logs will then be throttled until the time unit expires. When the timer resets, the logs will not be throttled.

e.g.

Suppose, we want to throttle TRK113 log. If the threshold value is set to 5 and tunits is 1, that means we only want five TRK113 log in one minute. Any TRK113 logs over five within a minute will be throttled. Because the DLOG field is set to 'NO', we won't be throttling TRK113 DLOGs.

**Figure 2 Functional Diagram**

**TABLE LOGTHROT:**

| REPNAME | THRSHOLD | TUNITS | DLOG |
|---------|----------|--------|------|
| -----   |          |        |      |
| TRK 113 | 5        | 1      | N    |

Recommended TUNITS value is 1 (min). Threshold value can be set based on site engineering information. Following are the some examples of threshold values used in CSP20, TUNITS id 1(mins):

| REPNAME  | THRSHOLD |
|----------|----------|
| -----    |          |
| AUDIT105 | 25       |
| AUDIT106 | 25       |
| TRK113   | 75       |
| C7UP103  | 25       |
| TRK138   | 75       |

### 1.3 Hardware Requirements or Dependencies

N/A.

### 1.4 Software Requirements or Dependencies

N/A

### 1.5 Limitations and restrictions

N/A



## 1.6 Interactions

N/A

## 1.7 Applicable customer facing sections

### Fault Management

Logs ☐ Yes ☐

Alarms ☐ No ☐

### Configuration

Data Schema ☐ No ☐

User Interface ☐ No ☐

Element Management ☐ No ☐

Security ☐ No ☐

Service Order ☐ No ☐

Office Parameters ☐ Yes ☐

Accounting (includes AMA billing) ☐ No ☐

Performance (includes operational measurements) ☐ No ☐

## 1.8 Glossary

| Term     | Description |
|----------|-------------|
| New term | Definition  |

***Product = CS 2000***

## **A00007282--Configurable Threshold for Failed Login Attempts**

### ***Functional Description***

## **1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

## 1.2 Description

This SN08 activity provides a way to configure the limit of failed login attempts for succession applications. The same retry limit will apply to the telnet and ssh access.

### 1.2.1 CLI Tool

The Command Line Interface of SSPFS is modified to provide an additional option to change the login retries limit value. Follow the procedure below to make changes to the retries limit value:

- 1 Start cli
- 2 Select option 2 (Configuration)
- 3 Select option 14 (Login Session)
- 4 Select option 4 (login\_retries)
- 5 Enter a value in the range 1 – 15.  
Any value not in this range will be rejected with an error:  
**“ERROR – Login Retries Limit Value Out Of Range”**

If the change is successful, the following message will be shown:  
**=== “login\_retries” completed successfully**

## 1.3 Hardware Requirements or Dependencies

Not applicable

## 1.4 Software Requirements or Dependencies

Not applicable

## 1.5 Limitations and restrictions

Not applicable

## 1.6 Interactions

Not applicable

## 1.7 Glossary

Not applicable



# SN08 Feature Deltas

*Product = CS 2000*

## **A00007383 - DNH (Directory Number Hunting) enhancements: pilot DN charge and display**

### **1.1 Applicable Solution(s)**

DMS

### **1.2 Description**

#### **1.2.1 General**

This feature provides two new facilities for DNH groups. For any call originated from any DNH group member DN (MDN) or pilot DN (PDN), the group's **pilot DN** will be:

- Charged for the call,
- Presented as the Calling Line Number nodally or to the network to be displayed at the far end, if the call provides Calling Line Identification (CLI) by default or upon Automatic Number Identification (ANI) request.

These facilities are provided for all members of all the DNH groups on an office basis. It is possible to turn on or off each functionality separately. Thus, each functionality can be either applied or not applied officewide at once, i.e. all DNH groups follow the same behavior. These facilities are enabled by defining a new tuple in table **ISERVOPT**. Operating company personnel use table ISERVOPT to configure switch information for service-related features. Figure 3 shows a sample datafill for table ISERVOPT.

**Figure 3 New ISERVOPT Tuple**

```
SOPTSKEY SOPTSVAR
-----
DNH_OPTS DNH_OPTS Y Y
```

The tuple introduces: a new entry *DNH\_OPTS* in the field *SOPTSKEY*; a new entry *DNH\_OPTS* in the field *SOPTSVAR*/subfield *OPTI*; and two new boolean subfields *PILOT\_CHARGE*, *PILOT\_DISPLAY*. The subfields' values 'Y/N' serve to turn functionalities on/off in the office.

## 1.2.2 Pilot DN Charge

### 1.2.2.1 Overview

The DNH group PDN can be charged for all calls originated by its members including calls originated by the PDN itself.

This functionality is achieved when the subfield *PILOT\_CHARGE* value is set to 'Y' in the new *ISERVOPT* tuple.

The pilot DN charge functionality uses the existing line option **SPB** (Special Billing). The SPB option allows a number other than the subscriber's DN to be used for billing.

Thus, to supply the desired functionality, every single member DN of a DNH group must have the SPB option assigned on it, with the field *SPBDN* (Special Billing Directory Number) filled with the pilot DN of that group. As the PDN is also charged for its own calls, it is not allowed to have the SPB option.

### 1.2.2.2 Service Order

Therefore, after the functionality is activated, a number of restrictions to SO commands take place:

The field *SPBDN* of the SPB line option being assigned or changed on any DNH group member, accepts only the value of the PDN of that group.

The supported SO commands are: ADO 'SPB', CHF 'SPB', ADD a new DNH member with the SPB option, and EST a new DNH group with the SPB option on a member.

- Addition of the SPB option to a pilot DN with the ADO and EST commands, is forbidden.
- Deletion of the SPB option from a DNH member with the command DEO, is forbidden.
- Definition of a new DNH member without the SPB option, is forbidden. It concerns commands ADO 'DNH', ADD, and EST.

Every restriction is accompanied by displaying an appropriate message.

Deletion of the DNH option from a member DN is allowed. A user gets a reminder message that the SPB option remains on this DN.

### 1.2.3 Pilot DN Display

For any call providing CLI, originated from a DNH group MDN, only the group's PDN is presented as the Calling Line Number nodally or to the network to be displayed at far end, by default or upon ANI request. The functionality must be set in the new tuple of table ISERVOPT as described above.

The **IBN** and **ISDNKSET** originators and local terminators are supported.

The PDN sending as a calling number is supported for calls outgoing via **ISUP** and **MFC** trunks as described below.

**ISUP:** When a call initiated by a DNH group member, goes out through an ISUP trunk, the Calling Party Number parameter in the ISUP Initial Address Message (**IAM**) contains the pilot DN of that group instead of the MDN.

As well, the PDN is also provided instead of the MDN in the INformation message (**INF**) that is sent in response to the received INformation Request message (**INR**).

**MFC:** MFC (FDCP R2, Type-A) support: Similarly, instead of the DNH group MDN call originator, its PDN is presented as the DN of the calling party in the **setup** message and also in the **information** message sent in response to the information request message.

## 1.3 Hardware Requirements or Dependencies

Not applicable.

## 1.4 Software Requirements or Dependencies

Not applicable.

## 1.5 Limitations and restrictions

For both Pilot Charge and Pilot Display only homogeneous IBN/ISDN DNH groups are supported, i.e. those consisting from only IBN or only ISDN lines.

### 1.5.1 Pilot DN Charge.

All limitations and restrictions of the SPB feature take place.

After the functionality is activated in table ISERVOPT, this feature controls only **further** actions performed with **SO** commands. It is the responsibility of TELCO personnel to handle all SPB definitions on all DNH groups defined before the activation of the functionality. Any changes carried out by any other means, e.g. Table Control, are beyond the scope of the feature.

SO support performs **no automatic** actions (such as addition of the SPB option to a newly added MDN). An appropriate **message** is displayed each time any restriction to SO commands set by this feature is violated (see above), and the

SO checking **rejects** the command. A user can then decide which further actions may be taken to achieve the goal, or may not take action at all.

### 1.5.2 Pilot DN Display.

For network calls, only **ISUP** and **MFC** trunk types are supported to send PDN as a calling number:

- **ISUP:** ETSI ISUP V2 Ethiopia (ETC) variant only;  
To support other ISUP variants, additional development is required.
- **MFC:** FDCP R2 and Type A protocols.

Only **IBN** and **BRI** subscribers are supported as call originators, local terminators, and pilots.

## 1.6 Interactions

The key requirement of the Pilot Display is that the pilot DN must be seen on the terminator's telephone display as a calling number in every call originated by its member - if presentation of the CGN of the originator is not suppressed.

Therefore this feature, being in effect, takes precedence over all other features that modify the display of the CGN:

For local calls:

- All these features are ignored when the Pilot Display is active, and the pilot DN is displayed as it is datafilled in table DNINV etc without any modification;
- All the features that use CGN but that do not change its display for a terminator, are not affected.

For line-to-trunk calls:

As an originating switch always sends a PDN instead of its MDN as a CGN, all the features that manipulate with the CGN in their way, are suppressed by the Pilot Display.

Definite interest may be presented in analysis of the interaction with the **Call Forward** feature:

**Pilot Charge.** When a call forward subscriber forwards a call, it pays for the second call leg, i.e. that between him and the terminator. The SPB feature covers this interaction, therefore no additional development is required to charge a pilot when its member forwards a call.

**Pilot Display.** In a call forward scenario, the real originator, and not the call forwarder, is displayed at the terminator's display. Hence, if a member forwards a call, its DN does not appear as the calling party DN and therefore

must not be replaced by the PDN in this interaction, which means that no development is required.

In **Malicious Call Trace** (MCT) feature, when MDN originated a call:

- For a **nodal** terminator, an MCT153 / MCT154 log is generated without any changes, i.e. the real originator (MDN, not PDN) appears at the field CALLING\_PARTY;
- For a **remote** terminator accessed via trunks, the PDN appears at the field CALLING\_PARTY.

## 1.7 Applicable customer facing sections

### Fault Management

|        |       |
|--------|-------|
| Logs   | _N/A_ |
| Alarms | _N/A_ |

### Configuration

|                    |       |
|--------------------|-------|
| Data Schema        | __X__ |
| User Interface     | _N/A_ |
| Element Management | _N/A_ |
| Security           | _N/A_ |
| Service Order      | __X__ |
| Office Parameters  | _N/A_ |

Accounting (includes AMA billing) \_N/A\_

Performance (includes operational measurements) \_N/A\_

## 1.8 Glossary

| Term | Description                     |
|------|---------------------------------|
| CLI  | Calling Line Identification     |
| CGN  | CallinG Number                  |
| DN   | Directory Number                |
| DNH  | Directory Number Hunting        |
| PDN  | Pilot DN                        |
| MDN  | Member DN                       |
| ANI  | Automatic Number Identification |
| SPB  | SPecial Billing                 |

| Term | Description                                    |
|------|------------------------------------------------|
| SO   | Service Order                                  |
| TC   | Table Control                                  |
| ETSI | European Telecommunication Standards Institute |
| ISUP | ISDN User Part                                 |
| ISDN | Integrated Services Digital Network            |
| MFC  | Multi Frequency Compelled                      |
| FDCP | Flexible Digital CAS Platform                  |
| CAS  | Common Channel Signalling                      |
| IBN  | Integrated Business Network                    |

## 2: Configuration for A00007383

### 2.1 Hardware and Software Requirements

The feature is developed in ISN08 (MMP21) s/w release and patched back to ISN04 (MMP17).

### 2.2 Initial Configuration

In loads older than ISN08 (MMP21), the patches containing the development code, are to be applied using the Post Release Software Manager (PRSM).

### 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

Not applicable.

### 2.4 Upgrade Impact

#### 2.4.1 Dump and Restore

Data of the only modified table ISERVOPT are transferred from the old s/w release to the new s/w release as usual within the data transfer process during ONP. Table changes do not require a reformat, since area refinement is added only.

It is obvious that if the table ISERVOPT being transferred, has the new tuple in the old release side, the patches must be applied in the new release side (unless the new release is ISN08 or higher).

#### 2.4.2 Element Management Upgrade

Not applicable.



## 2.5 Data schema (DS) (CM, MIBS, RDB)

### 2.5.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/OLD/UNCHANGED) |
|----------------|--------------------------|-----------------------------------|
| ISERVOPT       | changed                  | unchanged                         |

### 2.5.2 Table/MIB/Remote Database Schema information

#### 2.5.2.1 Name: ISERVOPT

International SERVICE OPTion

##### 2.5.2.1.1

Operating company personnel use table ISERVOPT to configure switch information for service-related features. This table groups multiple related pieces of data in a single entry.

Each service that uses this table provides a subfield related to that service. Each subfield asks for information in a format relevant to the service. This table accepts an entry if operating company personnel enter a service that is in the load.

##### 2.5.2.1.2 Usage sequence and implications (CM Only)

Current datafill order unchanged.

##### 2.5.2.1.3 Size

Table 2 Table size

| Abbreviated table name | Minimum tuples | Maximum tuples             | Information on memory                                   |
|------------------------|----------------|----------------------------|---------------------------------------------------------|
| ISERVOPT               | Unchanged      | Current maximum tuples + 1 | Memory is automatically allocated for additional tuple. |

##### 2.5.2.1.4 Fields/OIDs

The following table lists fields for ISERVOPT.

**Table 3 Table field descriptions**

| Field    | New or Changed | Subfield or refinement | Entry    | Explanation and action                                                                                                                                                                                                                                     |
|----------|----------------|------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SOPTSKEY | Changed        |                        | DNH_OPTS | Directory Number Hunting Options.<br><br>New entry DNH_OPTS in field SOPTSKEY is the key in ISERVOPT.                                                                                                                                                      |
| SOPTSVAR | Changed        | OPTION                 | DNH_OPTS | Directory Number Hunting Options.<br><br>New entry DNH_OPTS in field OPTION is the option name.                                                                                                                                                            |
|          |                | PILOT_CHARGE           | Y or N   | PILOT_CHARGE controls activation of the Pilot Charge functionality. When PILOT_CHARGE is set to N, the Pilot Charge functionality has no impact. When PILOT_CHARGE is set to Y, the Pilot Charge functionality is activated. The default value is N.       |
|          |                | PILOT_DISPLAY          | Y or N   | PILOT_DISPLAY controls activation of the Pilot Display functionality. When PILOT_DISPLAY is set to N, the Pilot Display functionality has no impact. When PILOT_DISPLAY is set to Y, the Pilot Display functionality is activated. The default value is N. |

**2.5.2.1.5 Datafill example**

The following example shows sample datafill for table ISERVOPT.

**Figure 4 Map display example for DNH\_OPTS option in table ISERVOPT**

```
SOPTSKEY SOPTSVAR
-----
DNH_OPTS DNH_OPTS Y Y
```

**Note:** The following list gives datafill examples for the DNH\_OPTS service. They are based on the four possible values for the DNH\_OPTS tuple, namely: KEY (SOPTSKEY), OPTION (SOPTSVAR), PILOT\_CHARGE, and PILOT\_DISPLAY.

No enhancements are turned on:  
DNH\_OPTS DNH\_OPTS N N

With this datafill neither functionality has impact. The tuple can be absent.

- Only the pilot charge enhancement is operational:  
DNH\_OPTS DNH\_OPTS Y N
- Only the pilot display enhancement is operational:  
DNH\_OPTS DNH\_OPTS N Y
- Both pilot charge and pilot display enhancements are operational;  
DNH\_OPTS DNH\_OPTS Y Y

#### **2.5.2.1.6 Table release history update**

The following information was added:

- Entry DNH\_OPTS added to field SOPTSKEY
- Entry DNH\_OPTS added to field SOPTSVAR/OPTION
- New subfields PILOT\_CHARGE and PILOT\_DISPLAY added to entry DNH\_OPTS in field SOPTSVAR/OPTION.

Maximum table size increased in number of one tuple.

#### **2.5.2.1.7 Supplementary information**

This table does not contain initial datafill. The operating company using this table provides datafill that refers to indicated services.

The default values of parameters PILOT\_CHARGE and PILOT\_DISPLAY are N. Even if tuple does not exist in ISERVOPT, the state is considered to be N for both functionalities. If the state of either parameter is Y, the respective functionality of the feature is available officewide. If the state is N, the respective functionality is suppressed.

PILOT\_CHARGE and PILOT\_DISPLAY require no restarts.

Every change of PILOT\_CHARGE and PILOT\_DISPLAY values including tuple addition/deletion is accompanied by displaying an appropriate message. This message informs a user about which functionality is activated/deactivated (one or both), briefly describes it, and informs a user about what actions are required from his side, if any. For more information please refer to “1.5.1 Pilot DN Charge.” on page 1193.

#### **2.5.2.1.8 Translation verification other tools**

ISERVOPT does not use translation verification tools.

## 2.6 Service Orders (SO) (CM & SESM)

### 2.6.1 Service order change details

Only **pilot charge** functionality has impacts on Service Order.

The overall impact consists in **additional** servord **checking** carried out when the pilot charge functionality is in active state (subfield *PILOT\_CHARGE* value is set 'Y' in the *DNH\_OPTS* ISERVOPT tuple).

The brief background of this functionality explaining **why** additional SO checking is needed, is as follows.

The pilot DN charge functionality uses the existing line option **SPB** (SPecial Billing). The SPB option allows a number other than the subscriber's DN to be used for billing. To charge a pilot DN (PDN) for all the calls originated by its members DN (MDN), **every** single **MDN** of a DNH group **must have** the SPB option assigned on it, with the field **SPBDN** filled with the PDN of that group. The **PDN** is also charged for its own calls therefore it is **not allowed** to have the SPB option. Therefore any SO command that may **violate** this state, passes through additional checking to avoid this. Besides, in one special case the additional SO checking is done in order to only attract a user's **attention** to possible need of further actions. More detailed description is in "1.2.2.2 Service Order" on page 1192.

SO support performs **no automatic** actions. That means:

- All the DNH groups that exist **at the moment** of activation of the pilot charge functionality, must be checked by the TELCO personnel for the correspondence with the state described above, and appropriate actions should be taken to bring them into this state. When setting this functionality 'Y', a user gets a message - see "2.5.2.1.7 Supplementary information" on page 1199, and also "1.5.1 Pilot DN Charge." on page 1193.
- If a performed SO command did not pass additional checking, only an appropriate **message** is displayed, and the command is **rejected** (except for the one special case mentioned above when the additional checking **allows** the command). A user can then decide which further actions may be taken to archive the goal, or may not take action at all.

This feature does not introduce any new LCC.

This feature does not introduce any new option.

#### 2.6.1.1 LCC and options

Neither a new LCC nor option is introduced by this feature.

All the limiting conditions of the SPB option remain valid.

This feature supports only **IBN** and **ISDNKSET LCC**.

### 2.6.2 New commands

This feature does not provide any new commands.

## 2.7 Software optionality control (SOC)

Table 4 SOC

|                          |                                   |
|--------------------------|-----------------------------------|
| SOC option name:         | DNH Pilot Enh                     |
| SOC option title:        | DNH Pilot Num for CLI and Billing |
| SOC option control type: | Tracked                           |
| New SOC option?          | Yes                               |
| SOC option order code    | SVBI0035                          |
| Option defined in DRU:   | WT                                |
| Affected products:       | DMS100                            |

All tracked SOC's are automatically created via PCA enforcement and no longer require design implementation.

## 2.8 Element Management

Not applicable.

## 2.9 Command interface changes

Not applicable.

## 2.10 Security

Not applicable.

## 2.11 Configuration Walkthrough

Not applicable.

***Product = CS 2000***

## **A00007393--Session Policy Controller**

### ***Functional Description***

## **1.1 Applicable Solution(s)**

## CHS

## 1.2 Background

In SN07, the CS2000 delivered admission control functionality by means of virtual call admission control (VCAC) on the Gateway Controller (GWC) component of the CS2000 architecture. The limitations of this as policy control platform along with the need to support CS2000 and potentially other application servers together behind the same access links drove the requirements to move VCAC onto a common platform which could serve multiple applications.

## 1.3 Overview

The SPC product functionality is implemented by the following feature activities:

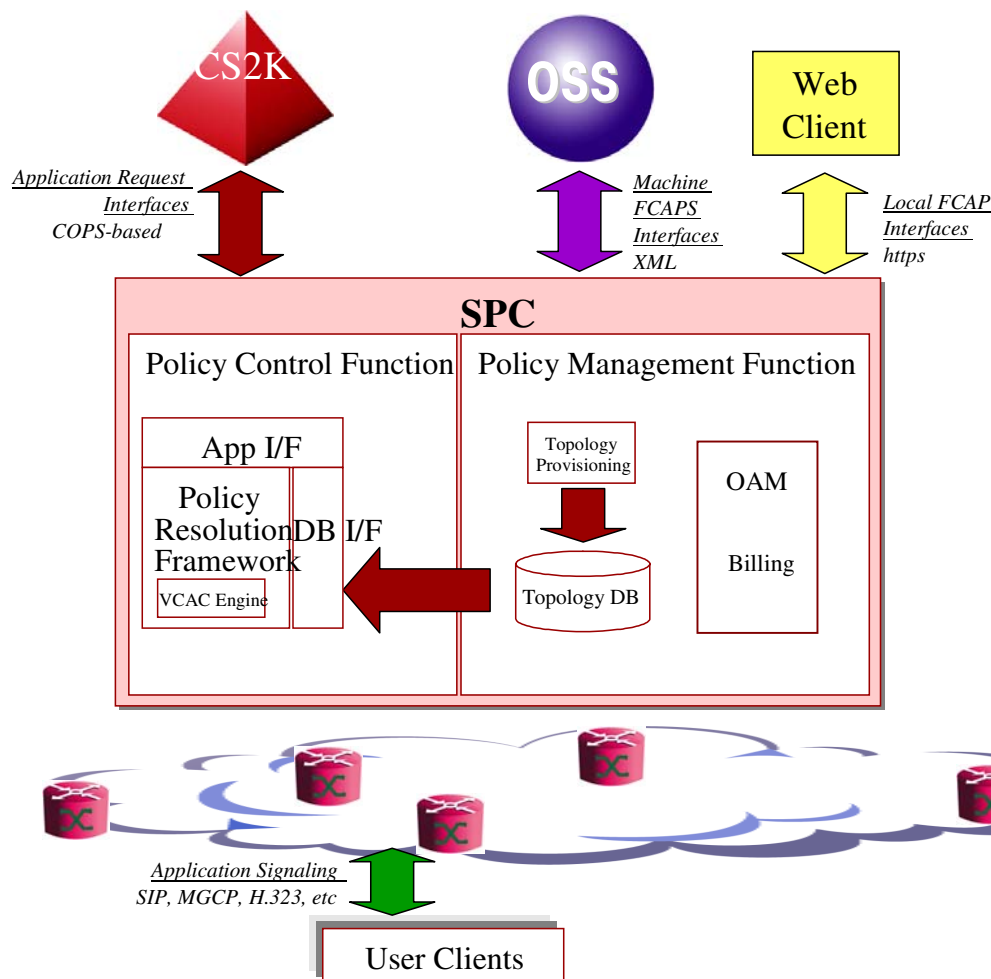
- A00007389 SPC Policy Control Framework
- A00007390 SPC Protocol Handler
- A00007391 SPC Provisioning Framework
- A00007392 SPC OAM
- A00007393 SPC Base
- A00007398 SPC Topology Manager

This FN document serves as the “umbrella” FN for the all above activities.

## 1.4 Feature Description

The Session Policy Controller monitors, controls, and enforces use of network resources. The SPC main functions are policy control and management. The SPC software application is delivered on the SAM-XTS hardware platform and the product is developed and based on the NGSS (Nortel General-purpose Session Server) software platform. The general model describing the Release 1 Session Policy Controller application functional components and interfaces is shown below.

Figure 1- Session Policy Controller (SPC) functional components



#### 1.4.1 Policy Control Framework

The SPC has a Policy Control Framework (PCF) that is responsible for processing requests for resources and applying the necessary policy enforcement mechanisms to the requests. All relevant network topology information needed is retrieved from a Topology Database.

##### 1.4.1.1 Policy Definition

In SN08 there will only one policy supported – VCAC Bandwidth Policy. This default policy exists to carry out network resource reservation function.

##### 1.4.1.2 Policy Enforcement Action

The SPC applies the default policy to all requests for network resources to enforce call admission control. Resource requests could be in the form of a flow specification or an amount of bandwidth requested. VCAC Bandwidth

usage calculations are used to monitor the bandwidth usage status, and ensure there are enough resources for a new call requests.

When an Application Server agrees to provide service to a client, it sends a request to the SPC that contains:

- Identity and location of the client to whom service is to be provided
- FlowSpec specifying traffic requirement for the session

### **Network Reservation using VCAC**

The Network Reservation requests are processed using Virtual Call Admission Control (VCAC) functionality. The initial release of the Session Policy Controller supports a VCAC capability that is substantially equivalent to that introduced on the CS2000 in SN07. One of the main advantages of moving the VCAC functionality off-board to the SPC is that, in SN07, GWCs cannot share count information among themselves. In SN08, resource modeling is performed on the SPC and since the SPC would have a full view of the topology, VCAC could be performed on application server-wide basis instead of just within one particular GWC's scope of control.

VCAC is a policy based Call Admission Control model used to provide Network Resource Based Admission Control by setting service class bandwidth limits based on the bandwidth available on the subscriber's access link. VCAC

### **VCAC Bandwidth Calculations**

The VCAC function can handle the tracking of bandwidth usage in terms of an Explicit or Implicit calculation of encapsulation overhead and link bandwidth. The mechanism is dependent on the definition of a Network Zone and associated Network link. The SPC topology model allows the customer to either describe a Network Link in terms of established Predefined protocol layers or by a custom link layer type.

#### **Implicit calculation**

The customer can choose to describe a network link in terms of the protocol layers (e.g. PPP/Ethernet/ATM) which comprise the link. These link layer types are predefined for use by the customer and are accessible via the SPC provisioning interface. A protocol layer is specified as having either a variable (e.g. Ethernet) or fixed (e.g. ATM) protocol data unit (PDU). In each case there is an encapsulation overhead, and in the fixed PDU case there is also the unit size & overhead. The SPC implicitly derives the value of the link overhead based on the definition of the predefined link layer type because the encapsulation overhead is associated with the protocol. For example, in the case of a fixed length PDU, the customer would also specify the unit size (e.g. ATM cellsize=53) and unit overhead amount (e.g. ATM header of 5 bytes).



Explicit calculation

If the customer prefers a simpler approach, they can choose not to model the specific protocol layers of the network link, but instead create a custom link layer and provision the bandwidth available on the link with a single value for the overhead. In this calculation no assumption is made about multiple link layers and the associated encapsulation overhead of each. It is expected that the craftsperson explicitly accounts for any overhead required for the link layer. In other words, the customer creates a “fudge factor” to account for overhead when they define the bandwidth available on the link. The overall bandwidth is explicitly calculated based on the bandwidth values and overhead provisioned by the customer.

**Networks Service Class (NSC)**

Nortel Networks has an established set of subscriber service classes that can be used to map traffic categories, DSCP, and other QoS/CoS parameter designations. NNSC names can be used to define individual traffic flow policies based on traffic conditions independently of the underlying bearer link protocol or network element resource. This could provide scalability for large networks that interoperate with various policy standards, including: DiffServ, IEEE 802.1p, COPS-PR, and LDAP.

In SN08, only voice calls are supported from the CS2000. All voice calls will be tagged as Premium.

**Table 1 - Sample NNSC Mappings**

| Traffic Category | Nortel Networks Service Class | Default DSCPs         | ATM     |        | Frame Relay |        | Ether-net 802.1p | MPLS E-LSP EXP | Scheduler | AQM  |
|------------------|-------------------------------|-----------------------|---------|--------|-------------|--------|------------------|----------------|-----------|------|
|                  |                               |                       | CoS     | CLP    | CoS         | DE     |                  |                |           |      |
| Network Control  | Critical                      | CS7                   | rt-VBR  | 0      | 3           | 0      | 7                | 111            | PQ        | None |
|                  | Network                       | CS6                   | rt-VBR  | 0      | 3           | 0      | 7                | 111            | WFQ       | None |
| Interactive      | Premium                       | EF, CS5               | rt-VBR  | 0      | 3           | 0      | 6                | 110            | PQ        | None |
|                  | Platinum                      | AF41, AF42, AF43, CS4 | rt-VBR  | 0<br>1 | 3           | 0<br>1 | 5                | 101            | WFQ       | WRED |
| Responsive       | Gold                          | AF31, AF32, AF33, CS3 | nrt-VBR | 0<br>1 | 2           | 0<br>1 | 4                | 100            | WFQ       | WRED |
|                  | Silver                        | AF21, AF22, AF23, CS2 | nrt-VBR | 0<br>1 | 1           | 0<br>1 | 3                | 011            | WFQ       | WRED |
| Timely           | Bronze                        | AF11, AF12, AF13, CS1 | nrt-VBR | 0<br>1 | 1           | 0<br>1 | 2                | 010            | WFQ       | WRED |
|                  | Standard                      | DF                    | UBR     | 1      | 0           | 1      | 0                | 000            | WFQ       | WRED |

### 1.4.2 Protocol Handler

The Protocol Handler provides a standard application interface specification to the Policy Control Framework. The Protocol Handler parses request messages that are delivered by the protocol stack and converts those requests into generic request messages which are passed to the Policy Control Framework. The protocol handler also receives generic responses from PCF, encodes the response in the required format for the specified protocol, and then sends this response back to application server.

Various protocols could be used between the application server and the SPC, such as COPS, Diameter, SOAP, etc... In release 1, an extension of the COPS based DQos protocol is the only protocol supported over the signaling interface between the CS2000's GWC and the SPC.

### 1.4.3 Provisioning Framework

The Session Policy Controller functions as its own element manager. This means that provisioning and maintenance activities for a Session Policy Controller takes place on the Session Policy Controller itself. The SPC provision framework provides a web based interface to configure SPC system parameters, provision network topology, perform application maintenance, and display SPC specific OMs, alarms, and logs. The SPC GUI has a similar look and feel some other Nortel Networks products. It shares a common 'look and feel' with other NGSS based applications such as SIP-GW. An OSS interface is also provided.

The SPC uses a database for persistent data storage of topology data and run-time configuration parameters. There are many components in SPC that access database to retrieve, insert, or update data. For example, PCF may need to retrieve topology from the database to construct the topology in the memory and Topology data needs to be input from the OSS into the database. Topology data and system tunable parameters can be changed by system operator or externally while the SPC is running and the internal components of the SPC must be notified of the change. An internal change notification mechanism is used to notify the internal components of the SPC what information has been changed.

The OSS and web browser are the only interfaces to manage provisioned data.

### 1.4.4 OAM Function

The SPC provides functionality for application maintenance such as Logs, Alarms, and OMs. The OMs, Logs, and Alarm information are recorded on the internal hard disk. These subsystems provide an interface to export the data off-board to IEMS. The Web Server can also retrieve active alarms and logs so that they can be displayed on the Web GUI.

Access to Application Maintenance commands is available from Web GUI.

The OM format is presented in the Performance Management section of this document.

The Alarm format is presented in the Fault Management section of this document.

The Log format is presented in the Fault Management section of this document.

#### **1.4.5 Topology Management**

The Session Policy Controller provides a topology database, topology configuration tools and schemas to support the VCAC capability. These topology configuration tools allow the craftsperson to manage topology data such as network zones and network links. There are topology provisioning interfaces for the web GUI and OSS.

### **1.5 Hardware Dependencies**

#### **1.5.1 SAM-XTS**

The hardware platform is the SAM-XTS (Service Application Module – eXtremely Thin Server). It is the Intel Langley Prestonia OEM’ed by Hewlett Packard as the HP-CC3310. The HP-CC3310 provides processing, memory, and disk capacity for Session Policy Controller application.

The HP cc3310 carrier-grade server is a Network Equipment Building Standards (NEBs) Level 3-certified platform in a 2U form factor. The server is designed for telecommunications central offices or data centers and deployed in a rack-mounted, space-saving configuration. Based on IA-32 processors and tuned for the Linux operating system, the HP cc3310 carrier-grade server is modular and based on industry standards.

The SAM-XTS is a platform for the delivery of multiple applications. Other applications that would reside on the SAM-XTS are the SIP Gateway application or STORM application.

#### **1.5.2 SAMF Frame**

The SAM-XTS server is mounted on the SAMF (NTRX51HA) frame.

### **1.6 Software Dependencies**

#### **1.6.1 Nortel Networks Software Dependencies**

##### **1.6.1.1 NGSS**

The Session Policy Controller product is developed on the NGSS (Nortel General-purpose Session Server) software platform. The NGSS software platform has a layered architecture, which consists of an application layer, a shared layer, and a Nortel Carrier-Grade Linux base layer. The Session Policy Controller software resides in the NGSS application layer, and the Session

Policy Controller uses the NGSS Application Maintenance Module to interface with the NGSS shared and base layer functions. In SN08, the NGSS platform does not support multiple applications to co-run together. Only one application can be enabled to operate on the platform.

## **1.6.2 Non Nortel Networks Software Dependencies**

The SPC application relies on several 3<sup>rd</sup> party software libraries and utilities.

### **1.6.2.1 ACE**

The Adaptive Communication Environment (ACE) is a freely available, open-source object-oriented tool framework that implements many core patterns for concurrent communication software. It is free to use and distribute without compromising Nortel IPR. The license can be found at <http://www.cs.wustl.edu/~schmidt/ACE-copying.html>

### **1.6.2.2 Xerces**

Xerces is one of the Apache Foundation projects. Xerces is a library that provides XML parsing and generation. Fully-validating parsers are available for both Java and C++, implementing the W3C XML and DOM (Level 1 and 2) standards, as well as the de facto SAX (version 2) standard. The parsers are highly modular and configurable. Initial support for XML Schema is also provided. It is free to use and distribute without compromising Nortel IPR. The license can be found at <http://apache.org/licenses/>

### **1.6.2.3 Struts**

Struts is one of the Apache Foundation projects. Struts is an open source framework for building Java web applications. The core of the Struts framework is a flexible control layer based on standard technologies like Java Servlets, JavaBeans, ResourceBundles, and XML. It is free to use and distribute without compromising Nortel IPR. The license can be found at <http://apache.org/licenses/>

## **1.7 Network Component Dependencies**

Refer to the SPC product specification for more information concerning supported configurations.

### **1.7.1 Nortel Networks Components**

#### **1.7.1.1 IEMS**

The Nortel Networks Integrated Element Management System (IEMS) is used to provide proxy connections for SPC OAM functions. The SPC provisioning web client can be launched from IEMS. A secure shell (SSH) connection to SPC from IEMS is required for OSS operations. The OSS operator position can log into the SPC via IEMS secure proxy and SSH.

IEMS can be used as:

- Web proxy for SPC OAM operations via Web GUI
- Secure proxy for SPC logon
- Secure proxy for SPC OAM operations via OSS

Refer to IEMS documentation for information on how to configure IEMS interfaces for web server proxy and secure proxy for OSS.

### **1.7.2 Non Nortel Networks Components**

Not Applicable

## **1.8 Restrictions and Limitations**

- Only one CS2000 per SPC.
- Initial commissioning of SPC in SN08 requires a transfer topology data from SESM to SPC. This requires customer involvement via OSS to query the data on SESM and then add it to SPC.
- Centralized authentication of passwords is not supported by base platform.
- SPC will not co-run with any other NGSS based application.
- There is no synchronization of topology data between the SPC and SESM. If a topology mismatch is encountered during SPC call processing, the call attempt would be still be allowed. However, VCAC would not be applied for that leg of the call, and log would be generated to indicate that there is a topology mismatch between the SPC and GWC/SESM.

## **1.9 References**

### **1.9.1 Specifications**

COPS-Dqos Specification

### **1.9.2 Internal Documents**

NGSS Fault Management guide

IEMS Configuration guide

OSSgate Users guide

## 1.10 Definitions & Abbreviations

|       |                                                |
|-------|------------------------------------------------|
| API   | Application Programming Interface              |
| CAC   | Call Admission Control                         |
| COPS  | Common Object Policy Service                   |
| DQOS  | Dynamic Quality of Service                     |
| IEMS  | Integrated Element Management System           |
| GUI   | Graphical User Interface                       |
| GWC   | Gateway Controller                             |
| KRS   | Keycode Retrieval System                       |
| NGSS  | Nortel General Purpose Session Server          |
| NCGL  | Nortel Carrier Grade Linux                     |
| PCF   | Policy Control Framework                       |
| PEP   | Policy Enforcement Point                       |
| QOS   | Quality of Service                             |
| SESM  | Succession Element Subsystem Manager           |
| SSPFS | Succession Server Platform Foundation Software |
| SPC   | Session Policy Controller                      |
| SIP   | Session Initiation Protocol                    |
| VCAC  | Virtual Call Admission Control                 |
| XML   | Extensible Markup Language                     |

## *Fault Management for A00007393*

### 2.1 Fault Management Strategy

Alarm and Logging capabilities span the Session Policy Controller application and NGSS software platform. The SPC derives its Alarm and Logging functionality from the NGSS software platform and a majority of these key functions are provided by the capabilities of the underlying NGSS platform itself. Refer to the NGSS Fault Management documentation for more detail concerning NGSS logs and alarms.

Alarm notifications are sent to the IEMS NMS in the form of SNMP traps. The standard Nortel Alarm MIB is used for this purpose. Alarms notifications are also distributed to the web server and can be viewed from the Web GUI. Active alarms will be refreshed automatically every 45 seconds. Alarms cleared automatically when the issue that raised the alarm has been corrected. The audit alarm will reappear after a period of time if the problem is not corrected.

The SPC captures all system events in the customer log which can be viewed from the web GUI. The log files are automatically rotated so that the log file system is never filled through logging activity.

### 2.1.1 Audits

The Session Policy Controller is capable of initiating audit requests. Audits may be required for the following events:

- The SPC can audit the GWC to determine if a flow is invalid. The mechanism allows the SPC to query the status of suspect flows. There is a configurable timer on each flow; the default value is 60 minutes. If the timer for the flow expires, the flow is considered suspect. SPC then audits the suspect flow by exchanging messages over the signaling interface with the application server.
- Switch of Activity (SWACT) – when Session Policy Controller changes activity from one unit to another, it will initiate audits in order to assure that it has not lost critical information in the transfer.
- Change in Link State – if links to the Application Server are lost, the flow status audits described above should be sufficient to assure any transactions lost during the link outage are accounted for.

The results of the audits are logged.

## 2.2 Fault Management Tools and Utilities

The standard Nortel Alarm MIB is used to deliver alarm notification to the IEMS NMS.

All logs are stored locally on disk in custlog format. They can be viewed on the web GUI and transferred over the network to a log host. The logs use the SYSLOG utility in the NGSS base. File rotation will be based on the file size and file rotation timer. The file rotation time, maximum file size and file retention can be configured using the Logrotate utility. The Logs are sent automatically to IEMS.

## 2.3 SPC Alarms

### 2.3.1 SPC Application Server Signaling Communication Alarm

| Alarm                         |                                                                                                             | Description                                                                                 | Corrective Action                                                          |
|-------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| APPSVR_SIGNALING_COMM_FAILURE |                                                                                                             | This alarm is generated for an Application Server Signaling interface communication failure | Check the application server status and the link to the application server |
| Category:                     | Communications                                                                                              |                                                                                             |                                                                            |
| Severity:                     | Major                                                                                                       |                                                                                             |                                                                            |
| Cause:                        | Application Server Signaling Communication Failure                                                          |                                                                                             |                                                                            |
| Duration:                     | Until Application Server Signaling Communication is reestablished Or the alarm auto clear timer is expired. |                                                                                             |                                                                            |

## Raise and Cleared Alarm Report Parameters:

| Report Parameter | Raise Alarm                                                | Clear Alarm                                                  |
|------------------|------------------------------------------------------------|--------------------------------------------------------------|
| alarmLevel       | eAS_Major                                                  | eAS_Cleared                                                  |
| componentID      | SPCP                                                       |                                                              |
| category         | eAPC_Communications                                        |                                                              |
| description      | AppServer <i>IPAddress</i> Signaling Communication Failure | AppServer <i>IPAddress</i> Signaling Communication Recovered |
| probableCause    | eAP_outOfService                                           |                                                              |
| specificProblem  | AppServer Signaling Communication Failure                  |                                                              |
| reportName       | SPCP                                                       |                                                              |
| reportNum        | 301                                                        |                                                              |
| eventType        | cTBL                                                       |                                                              |
| label            | AppServer Signaling Communication Failure                  | AppServer Signaling Communication Recovered                  |
| notificationID   | 0                                                          | Raise alarm generated value                                  |

## 2.3.2 SPC No Database Connection Alarm

| Alarm                |                                                                                                                                                                                                                                                                                                                                           | Description                                               | Corrective Action              |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|--------------------------------|
| SPC_NO_DB_CONNECTION |                                                                                                                                                                                                                                                                                                                                           | This alarm is generated when SPC lost database connection | Contact next level of support. |
| Category :           | Communications                                                                                                                                                                                                                                                                                                                            |                                                           |                                |
| Severity:            | Critical                                                                                                                                                                                                                                                                                                                                  |                                                           |                                |
| Cause:               | SPC lost database connection. This alarm is raised if SPC cannot establish a connection with the database during Policy Controller process initialization. The alarm should clear itself. At start-up, if Policy Controller process cannot establish a connection with the database it will restart itself and re-attempt the connection. |                                                           |                                |
| Duration:            | Until SPC database connection is reestablished                                                                                                                                                                                                                                                                                            |                                                           |                                |

## Raise and Cleared Alarm Report Parameters:

| Report Parameter | Raise Alarm                           | Clear Alarm                                    |
|------------------|---------------------------------------|------------------------------------------------|
| alarmLevel       | eAS_Critical                          | eAS_Cleared                                    |
| componentID      | SPCP                                  |                                                |
| category         | eAPC_Communications                   |                                                |
| description      | SPC Processing No Database Connection | SPC Processing Database Connection Established |
| probableCause    | eAP_outOfService                      |                                                |
| specificProblem  | No Database Connection                |                                                |
| reportName       | SPCP                                  |                                                |
| reportNum        | 302                                   |                                                |
| eventType        | cTBL                                  |                                                |
| label            | No Database Connection                | Database Connection Established                |
| notificationID   | 0                                     | Raise alarm generated value                    |



### 2.3.3 SPC Reservation Request Mass Failure Alarm

| Alarm                |                                                                                 | Description                                                                                                    | Corrective Action              |
|----------------------|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------|
| REQUEST_MASS_FAILURE |                                                                                 | This alarm is generated when Application server request failure ratio exceeds predefined threshold value <TBD> | Contact next level of support. |
| Category :           | QualityOfService                                                                |                                                                                                                |                                |
| Severity:            | Minor                                                                           |                                                                                                                |                                |
| Cause:               | Application server request failure ratio exceeds predefined threshold           |                                                                                                                |                                |
| Duration:            | Until Application server request failure ratio falls below predefined threshold |                                                                                                                |                                |

Raise and Cleared Alarm Report Parameters:

| Report Parameter | Raise Alarm                          | Clear Alarm                         |
|------------------|--------------------------------------|-------------------------------------|
| alarmLevel       | eAS_Minor                            | eAS_Cleared                         |
| componentID      | SPCP                                 |                                     |
| category         | eAPC_QualityOfService                |                                     |
| description      | CAC Request Failure Exceed Threshold | CAC Request Failure Below Threshold |
| probableCause    | eAP_thresholdCrossed                 |                                     |
| specificProblem  | CAC Request Mass Failure             |                                     |
| reportName       | SPCP                                 |                                     |
| reportNum        | 303                                  |                                     |
| eventType        | cTBL                                 |                                     |
| label            | CAC Request Mass Failure             |                                     |
| notificationID   | 0                                    | Raise alarm generated value         |

### 2.3.4 SPC Endpoint Number Exceed Endpoint Block Size Alarm

| Alarm                                      |                                                                                                                                                                                                                                             | Description                                                                  | Corrective Action                                          |
|--------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------|
| ENDPOINT_NUMBER_EXCEED_ENDPOINT_BLOCK_SIZE |                                                                                                                                                                                                                                             | This alarm is generated when SPC Endpoint Number Exceeds Endpoint Block Size | Get a new license to enlarge the endpoint number supported |
| Category:                                  | QualityOfService                                                                                                                                                                                                                            |                                                                              |                                                            |
| Severity:                                  | Critical                                                                                                                                                                                                                                    |                                                                              |                                                            |
| Cause:                                     | SPC Endpoint Number Exceeds Endpoint Block Size                                                                                                                                                                                             |                                                                              |                                                            |
| Duration:                                  | Until SPC Endpoint Number falls below Endpoint Block Size or Endpoint Block Size is increased. A password is required to increase the Endpoint block size. The service provider has to contact Nortel customer support to get a new license |                                                                              |                                                            |

Raise and Cleared Alarm Report Parameters:

| Report Parameters | Raise Alarm                                | Clear Alarm                               |
|-------------------|--------------------------------------------|-------------------------------------------|
| alarmLevel        | eAS_Critical                               | eAS_Cleared                               |
| componentID       | SPCP                                       |                                           |
| category          | eAPC_QualityOfService                      |                                           |
| description       | Endpoint Number Exceed Endpoint Block Size | Endpoint Number Below Endpoint Block Size |

|                 |                                            |                                      |
|-----------------|--------------------------------------------|--------------------------------------|
| probableCause   | eAP_thresholdCrossed                       |                                      |
| specificProblem | Endpoint Number Exceed Endpoint Block Size |                                      |
| reportName      | SPCP                                       |                                      |
| reportNum       | 304                                        |                                      |
| eventType       | cTBL                                       |                                      |
| label           | Exceed Endpoint Block Size                 | Exceed Endpoint Block Size Recovered |
| notificationID  | 0                                          | Raise alarm generated value          |

### 2.3.5 SPC Endpoint Number Exceed Endpoint Block Warning Size Alarm

| Alarm                                              |                                                                   | Description                                                                          | Corrective Action                                          |
|----------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------------------------------|------------------------------------------------------------|
| ENDPOINT_NUMBER_EXCEED_ENDPOINT_BLOCK_WARNING_SIZE |                                                                   | This alarm is generated when SPC Endpoint Number Exceeds Endpoint Block Warning Size | Get a new license to enlarge the endpoint number supported |
| Category :                                         | QualityOfService                                                  |                                                                                      |                                                            |
| Severity:                                          | Major                                                             |                                                                                      |                                                            |
| Cause:                                             | SPC Endpoint Number Exceeds Endpoint Block Warning Size           |                                                                                      |                                                            |
| Duration:                                          | Until SPC Endpoint Number falls below Endpoint Block Warning Size |                                                                                      |                                                            |

Raise and Cleared Alarm Report Parameters:

| Report Parameters | Raise Alarm                                        | Clear Alarm                                       |
|-------------------|----------------------------------------------------|---------------------------------------------------|
| alarmLevel        | eAS_Major                                          | eAS_Cleared                                       |
| componentID       | SPCP                                               |                                                   |
| category          | eAPC_QualityOfService                              |                                                   |
| description       | Endpoint Number Exceed Endpoint Block Warning Size | Endpoint Number Below Endpoint Block Warning Size |
| probableCause     | eAP_thresholdCrossed                               |                                                   |
| specificProblem   | Endpoint Number Exceed Endpoint Block Warning Size |                                                   |
| reportName        | SPCP                                               |                                                   |
| reportNum         | 305                                                |                                                   |
| eventType         | cTBL                                               |                                                   |
| label             | Exceed Endpoint Block Warning Size                 | Exceed Endpoint Block Warning Size Recovered      |
| notificationID    | 0                                                  | Raise alarm generated value                       |

### 2.3.6 Topology Manager No Database Connection Alarm

| Alarm                |                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Description                                                             | Corrective Action              |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------------------------|
| TPM_NO_DB_CONNECTION |                                                                                                                                                                                                                                                                                                                                                                                                                                                             | This alarm is generated when Topology Manager lost database connection. | Contact next level of support. |
| Category :           | Communications                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                         |                                |
| Severity:            | Critical                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                         |                                |
| Cause:               | Topology Manager lost database connection. This alarm is raised if SPC cannot establish a connection with the database during Topology Manager process initialization or if the application fails to access the DB. The alarm should clear itself after the next topology change/update request is received. At start-up, if Topology Manager process cannot establish a connection with the database it will restart itself and re-attempt the connection. |                                                                         |                                |
| Duration:            | Until Topology Manager database connection is reestablished                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                         |                                |

Raise and Cleared Alarm Report Parameters:

| Report Parameters | Raise Alarm                             | Clear Alarm                                      |
|-------------------|-----------------------------------------|--------------------------------------------------|
| alarmLevel        | eAS_Critical                            | eAS_Cleared                                      |
| componentID       | TPM                                     |                                                  |
| category          | eAPC_Communications                     |                                                  |
| description       | Topology Manager No Database Connection | Topology Manager Database Connection Established |
| probableCause     | eAP_outOfService                        |                                                  |
| specificProblem   | No Database Connection                  |                                                  |
| reportName        | TPM                                     |                                                  |
| reportNum         | 301                                     |                                                  |
| eventType         | cTBL                                    |                                                  |
| label             | No Database Connection                  | Database Connection Established                  |
| notificationID    | 0                                       | Raise alarm generated value                      |

## 2.4 SPC Logs

Log Files are created to store the logs on the local disk in the custlog format. In addition to the SPC specific logs, NGSS Application Maintenance (NAM) logs 500, 300, 301, and 302 are generated during SPC operation. Refer to the NGSS Fault Management documentation for more information about those logs.

### 2.4.1 SPC Startup

#### 2.4.1.1 Explanation

This log is generated when the SPC starts up.

**2.4.1.2 Format**

|             |             |
|-------------|-------------|
| Report Name | SPCP        |
| Report Num  | 501         |
| Alarm Value | NONE        |
| Event Type  | INFO        |
| LABEL       | SPC Startup |

**2.4.1.3 Action**

None

**2.4.1.4 Associated Operational Measurements or Performance Measurements**

None

**2.4.2 SPC Shutdown****2.4.2.1 Explanation**

This log is generated when the SPC shuts down

**2.4.2.2 Format**

|             |              |
|-------------|--------------|
| Report Name | SPCP         |
| Report Num  | 502          |
| Alarm Value | NONE         |
| Event Type  | INFO         |
| LABEL       | SPC Shutdown |

**2.4.2.3 Action**

None

**2.4.2.4 Associated Operational Measurements or Performance Measurements**

None

**2.4.3 Audit Result****2.4.3.1 Explanation**

This log is generated when a Flow Status Audit is completed.

**2.4.3.2 Format**

|             |              |
|-------------|--------------|
| Report Name | SPCP         |
| Report Num  | 601          |
| Alarm Value | NONE         |
| Event Type  | INFO         |
| LABEL       | Audit Result |

**2.4.3.3 Action**

None

#### **2.4.3.4 Associated Operational Measurements or Performance Measurements**

None

### **2.4.4 CAC Request Denied**

#### **2.4.4.1 Explanation**

This log is generated when CAC request from Application server is denied.

#### **2.4.4.2 Format**

|             |                    |
|-------------|--------------------|
| Report Name | SPCP               |
| Report Num  | 602                |
| Alarm Value | NONE               |
| Event Type  | INFO               |
| LABEL       | CAC Request Denied |

#### **2.4.4.3 Action**

None

#### **2.4.4.4 Associated Operational Measurements or Performance Measurements**

The following OMs are pegged

- SPC Reservation Request or SPC Commit Request
- CAC Request on Network Segment

### **2.4.5 SPC Topology Change**

#### **2.4.5.1 Explanation**

This log is generated when spc callp accepts a topology change.

#### **2.4.5.2 Format**

|             |                 |
|-------------|-----------------|
| Report Name | SPCP            |
| Report Num  | 603             |
| Alarm Value | NONE            |
| Event Type  | INFO            |
| LABEL       | Topology Change |

#### **2.4.5.3 Action**

None

#### **2.4.5.4 Associated Operational Measurements or Performance Measurements**

None

## 2.4.6 Topology Mismatch

### 2.4.6.1 Explanation

This log is generated when callP detects that the Ingress Id of the Network Segment sent in a GateSet message from the GWC is not present in the SPC database. This is an indication that there could be a topology mismatch between the SPC and GWC/SESM. A summary of the requested change is included in the free text portion of the report description field.

### 2.4.6.2 Format

|             |                   |
|-------------|-------------------|
| Report Name | SPCP              |
| Report Num  | 604               |
| Alarm Value | NONE              |
| Event Type  | INFO              |
| LABEL       | Topology Mismatch |

### 2.4.6.3 Action

None

### 2.4.6.4 Associated Operational Measurements or Performance Measurements

None

## 2.4.7 TPM Startup

### 2.4.7.1 Explanation

This log is generated when the Topology Manager starts up.

### 2.4.7.2 Format

|             |                         |
|-------------|-------------------------|
| Report Name | TPM                     |
| Report Num  | 501                     |
| Alarm Value | NONE                    |
| Event Type  | INFO                    |
| LABEL       | TopologyManager Startup |

### 2.4.7.3 Action

None

### 2.4.7.4 Associated Operational Measurements or Performance Measurements

None

## 2.4.8 TPM Shutdown

### 2.4.8.1 Explanation

This log is generated when the Topology Manager shuts down

#### 2.4.8.2 Format

|             |                          |
|-------------|--------------------------|
| Report Name | TPM                      |
| Report Num  | 502                      |
| Alarm Value | NONE                     |
| Event Type  | INFO                     |
| LABEL       | TopologyManager Shutdown |

#### 2.4.8.3 Action

None

#### 2.4.8.4 Associated Operational Measurements or Performance Measurements

None

### 2.4.9 Topology Change

#### 2.4.9.1 Explanation

This log is generated when topology manager accepts a topology change. A summary of the requested change is included in the free text portion of the report description field.

#### 2.4.9.2 Format

|             |                 |
|-------------|-----------------|
| Report Name | TPM             |
| Report Num  | 603             |
| Alarm Value | NONE            |
| Event Type  | INFO            |
| LABEL       | Topology Change |

#### 2.4.9.3 Action

None

#### 2.4.9.4 Associated Operational Measurements or Performance Measurements

None

### *Performance Management for A00007393*

The SPC application has its own set of performance measurement although it relies on the NGSS base platform for some of its OM facilities.

## 3.1 Performance Management Strategy

The SPC has two types of OMs: Static and Per-Instance. Static OMs are performance measurements in the traditional sense where the counter/gauge is created when the application starts and exists for the duration of the SPC application. Per-Instance OMs are dynamic performance measurements that are captured for semi-permanent objects such as network nodes or endpoints.

The number of per-instance OMs can vary. There can be up to 5000 network nodes.

### 3.2 Performance Management Tools and Utilities

The SPC uses the common OM Framework provided by the NGSS platform for all OM functions. The OMs can be retrieved via FTP for off-board processing. The OMSHOW utility can be used to view from the NGSS platform.

In NGSS OM subsystem, the OM system stores the OM data to CSV files. It generates 5Min files and 15~30Min files for all OMs. The 5Min files would be kept for 30 minutes and the 15~30Min files kept for 24 hours.

NGSS platform provides ftp access to the stored OM data. These files can be periodically FTP'ed to the IEMS and viewed.

15 or 30 minutes data are stored in  
/opt/apps/ngsspm/stdhist

5 minutes data would be stored in  
/opt/apps/ngsspm/trafhist

OM files would be named like NGSS. OMs. QoS. 2004. 5. 25\_10. 15\_CDT. csv

### 3.3 Performance Measurements (PM), Operational Measurements (OM), and Stats

#### 3.3.1 SPC Reservation Request

This OM group records reservation request events on the SPC signaling interface.

| OM Item                      | Peg Event                                                                               |
|------------------------------|-----------------------------------------------------------------------------------------|
| IC_RESERVATION_REQUESTS      | When SPC receives a incoming reservation request                                        |
| RESERVATION_REQUESTS_SUCCESS | When SPC sends a reservation success response                                           |
| RESERVATION_REQUESTS_FAILURE | When SPC sends a reservation failure response because resource is unavailable           |
| RESERVATION_REQUESTS_ERROR   | When SPC sends a reservation error response because the request has a incorrect context |

#### 3.3.2 SPC Commit Request

This OM group records commit request events on the SPC signaling interface.



| OM Item                 | Peg Event                                                                          |
|-------------------------|------------------------------------------------------------------------------------|
| IC_COMMIT_REQUESTS      | When SPC receives a incoming commit request                                        |
| COMMIT_REQUESTS_SUCCESS | When SPC sends a commit success response                                           |
| COMMIT_REQUESTS_FAILURE | When SPC sends a commit failure response because resource is unavailable           |
| COMMIT_REQUESTS_ERROR   | When SPC sends a commit error response because the request has a incorrect context |

### 3.3.3 SPC Deletion Request

This OM group records deletion request events on the SPC signaling interface.

| OM Item                   | Peg Event                                                                            |
|---------------------------|--------------------------------------------------------------------------------------|
| IC_DELETION_REQUESTS      | When SPC receives a incoming deletion request                                        |
| DELETION_REQUESTS_SUCCESS | When SPC sends a deletion success response                                           |
| DELETION_REQUESTS_ERROR   | When SPC sends a deletion error response because the request has a incorrect context |

### 3.3.4 SPC CallP

This OM group records SPC Callp OMs.

| OM Item               | Peg Event                                 |
|-----------------------|-------------------------------------------|
| NUM_HalfCall_Attempts | When SPC receives a half call attempts    |
| NUM_HalfCall_Success  | When SPC successfully sets up a half call |

### 3.3.5 Topology Update

This OM group records topology update events in the topology manager

| OM Item                     | Peg Event                                                              |
|-----------------------------|------------------------------------------------------------------------|
| IC_PROV_TOPO_UPDATE         | When TPM receives a incoming topology update transaction from Web Prov |
| IC_PROV_TOPO_UPDATE_FAILURE | When a incoming topology update transaction from Web Prov is failed    |
| IC_OSS_TOPO_UPDATE          | When TPM receives a incoming topology update transaction from OSS      |
| IC_OSS_TOPO_UPDATE_FAILURE  | When a incoming topology update transaction from OSS is failed         |

### 3.3.6 CAC Request on Network Segment

This is a Per-Instance OM. This group records CAC requests to each network segment.

| OM Item              | Peg Event                                             |
|----------------------|-------------------------------------------------------|
| CAC_REQUESTS         | When SPC sends CAC request to certain network segment |
| CAC_REQUESTS_SUCCESS | When CAC request to certain network segment succeeds. |
| CAC_REQUESTS_FAILURE | When CAC request to certain network segment fails.    |

## 3.4 Command User Interface

### 3.4.1 Web GUI

A web-based GUI interface is used to display the Session Policy Controller Element Manager. The Web-based graphical user tools are provided to allow the customer to define and configure topology elements and also supports SPC configuration and management. The web interface is used to perform both provisioning and maintenance activities.

### 3.4.2 Supported Browsers

The following operating systems are supported:

- Win2K, Win2003, Windows XP based operating system
- Solaris version 2.8, 2.9, 2.10

Supported web browsers include:

- Internet Explorer 6.0 SP1+
- Netscape 6.2.3+ with exception of Netscape 7.0

### 3.4.3 OSS

The SPC supports an OSS interface for topology provisioning and maintenance. The OSS interfaces are programmed to process XML command requests as service orders are sent. Separate commands are required for multiple operations. For example, in order to add multiple Network Segments, an XML command request would be needed for each Network Segment.

See the following section for security aspects of using OSS via IEMS.

The SPC XML command schema is published separately.

## 3.5 Security

### 3.5.1 Access

The SPC web GUI pages follow the same security model as other NGSS based applications. There are some privileges which can be assigned to specific craftspersons. For example, some craftsperson may only have read-only privilege, and someone with administrator privileges can write and modify the SPC configuration.

The UID/Password is used to determine the user access level, and privileges are based on user access level. The authentication of user is done during the login process. For each topology configuration command, the access privilege is checked and based on the user group. If the user does not have sufficient privilege to execute a command, an error message "Insufficient Security Privileges to perform this action" is returned as part of the response.

The SPC reuses the same set of access groups as other NGSS based applications for configuration, provisioning, and maintenance commands. The access group levels would be as follows:

- mgcadm
- mgcrw
- mgcprov
- mgcmtc
- mgcro

### 3.5.2 CSLAN

The SPC is deployed on the CSLAN. The signaling between the CS2000-GWC and SPC takes place on a subnet of the CSLAN.

The SPC provisioning web client can be launched from IEMS. The OSS operator can log into the SPC via IEMS/SSPFS's

### 3.5.3 Overload Controls

The SPC provides a uniform topology provisioning interface for OSS and SPC Web GUI. This interface is responsible for creating server sockets, listening ports, setting up a new connection when a client (OSS or GUI) is connected, authenticating users, and receiving client (OSS or GUI) requests. Since the management interface can process multiple connections at the same time, the SPC implements a delayed IP address holder function to prevent any one user from abusing these connections.

For example if a user setup many connections, and once those connections are established, ignores them, closes connections, and repeatedly sets up new

connections, this could waste much CPU time and other resources, and even block other applications running in the same machine.

The SPC Delayed IP Holder function detects this type of activity. If a user sets up a connection and does nothing but immediately closes connection, the client's IP address will be recorded and any connections from that IP address are rejected until the delay-time for that IP address has expired. The delay timer is configurable and default value is 10 seconds

### **3.5.4 Platform security**

The Session Policy Controller derives Security functionality from the NGSS software platform.

In SN08, the platform provides:

- User login and password authentication
- Web based security user access via HTTPS
- Secure shell environment (SSH)

## **3.6 SOC and Keycoding**

The SPC revenue model is based on the number of Endpoints in use on the SPC. A usage control function is used to restrict the number of Endpoint that the service provider can use.

The endpoint usage is purchased in blocks of 5000. The Endpoint block size is maximum number of end points allowed to be in use on the SPC. The endpoint block size allotment is configurable from the GUI, and its provisioning protected by set of passwords. Changes to this endpoint block size require the craftsperson to enter a password. The password protection or software license key functions as a SOC. So for example, if the endpoint block size was 5000, there would be 20 passwords for each increment in block size up to 100,000. In effect every increase in block size is protected by a specific password.

OMs are used to track the number of endpoint in use over 14 days. When the endpoint count passed a threshold (a percentage of endpoint block size), alarms are raised, and the event logged. After the endpoint count exceeded the maximum endpoint block size, call attempts to additional endpoints are denied. Subsequent calls to new endpoints continue to be denied until the endpoint block size is increased. A password is required to increase the Endpoint block size. The service provider has to contact Nortel customer support to get the password.

## 3.7 References

### 3.7.1 Specifications

COPS-Dqos Specification

### 3.7.2 Internal Documents

NGSS Fault Management guide

IEMS Configuration guide

OSSgate Users guide

***Product = CS 2000***

## **A00007394--Network VCAC CallP**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

CHS

#### **1.2 Overview**

This FN mainly covers Network Virtual Call Admission Control (network VCAC), Actid A00007394. In addition, it also contains some information on following features.

- Network VCAC Maintenance & Upgrades (A00007399)
- Session Policy Controller (A00007393)
- Network VCAC Topology Provisioning (A00007242)

#### **1.3 Description**

Network Virtual Call Admissions Control (Network VCAC) is a Quality of Service (QoS) mechanism that allows the Communication Server 2000 (CS 2000) to cancel post-dial, pre-ringing calls that would overload a segment of the packet network. This is an enhancement of Basic VCAC (SN07, ACT.A00002739).

##### **1.3.1 Network VCAC vs. Basic VCAC**

For those familiar with Basic VCAC, its worth mentioning the main differences between Network VCAC and Basic VCAC.

The first notable difference is that bandwidth is tracked on the GWC in SN07. Whereas in SN08, the tracking is done externally to the GWC on a Session Policy Controller (SPC).

In SN08, Network VCAC removes the critical restrictions on deploying VCAC on sites with a mix of gateway types, which is imposed by Basic VCAC in SN07. It also removes the limitation of an LBL and the gateway behind it having to be on the same GWC.

In addition, the presence of a Session Policy Controller (SPC) adds new network management flexibilities through its management interface. It also provides additional logs and Operational Measurements (OM). For further information on the SPC see reference 1.

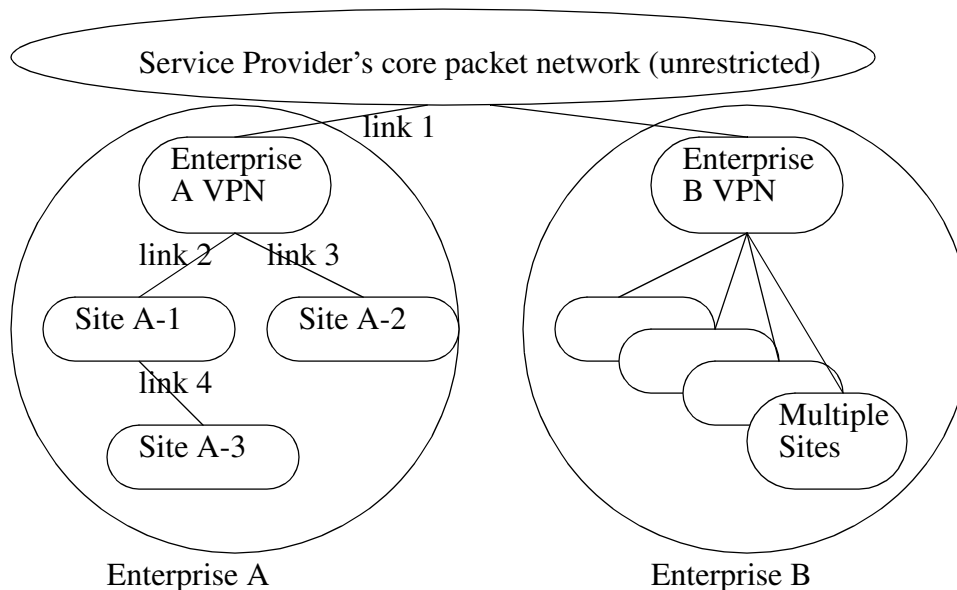
Network VCAC also supports composite network zones (a zone type that is a NAT and LBL at the same time). This type of zone is not supported by the SN07 Basic VCAC.

### **1.3.2 Detailed description**

Network VCAC depends on a logical model of the packet network. This starts with the Service Provider's core packet network and points of bandwidth concentration. These could, for example, be customer enterprises that are made up of a collection of sites or a regional broadband aggregation point. These sites are connected by a mix of Limited Bandwidth Links (LBLs) and NATs. The Voice over IP (VoIP) Gateways (GWs) and hence the lines are located within the sites in each enterprise.

It should be noted that when we say a 'site' or a 'network zone', we are really talking about the same thing. Similarly, when we say a 'link' it is the same as a 'network link'.

Figure 1, High level view of a sample VCAC topology



The logical model that network VCAC uses is based on the links between the sites. The GWs are described as being behind or below a particular link. So, in Enterprise A in Figure 1, A GW in Site A-3 is behind link 4, which is behind link 2, which in turn is behind link 1.

Each of these links will be either a Limited Bandwidth Link (LBL) or a NAT. The LBLs have a provisioned level of resources available and know how many resources each call type consumes. NAT traversal was handled in Feature ACT.89007980 in SN06.

Once a call is made, the CS 2000 identifies the LBLs and NATs that the GWs are behind and informs the Session Policy Controller (SPC) that a call is being made using these LBLs and NATs as the entry and exit points on the network. The SPC looks up the LBLs along the speech path between the two endpoints, and calculates if there are sufficient resources available on all the LBLs not to exceed the provisioned limits. The SPC provides a response allowing or not allowing the call as follows:

- 1) If all the LBLs can handle the new call, then the call progresses as normal.
- 2) If one or more LBLs cannot handle the call the originator receives a treatment provisioned by the carrier. The terminator has not reached a ringing stage so is unaware of the call attempt.

An example would be a call between a GW in Site A-3 and Site A-2. This call will use resources on links, 2, 3 and 4, but not on link 1 as the call doesn't leave the enterprise. An insufficient resources failure on any of the links will result in the call going to treatment.

The CS2M provisioning is described in activity ACT.A00007242CS2M, Network VCAC topology Provisioning and the SPC provisioning is described in activity ACT.A00007393SPC

It should be noted that if the SPC application is not available or the TCP connection between the GWC and the SPC is down, the call will be allowed to go through without doing any checks on bandwidth availability. Also, should the SPC topology not know about any particular link it is queried on it will reply with an error and the GWC will allow the call to proceed without any Admissions Control. These types of error can degrade the VCAC application as it allows calls access to the network without accounting for them.

#### Detailed description

##### The Logical Network Model

VCAC requires an operator to create a logical model of their network, made up of Limited Bandwidth links (LBL) and NATs. NAT traversal was added in ACT.89007980 in SN06, so the remainder of this description will focus on LBLs. This topology is provisioned on to the CS2M and the SPC using the OSS if it is present or onto each system separately if no OSS is present.

A LBL can represent a physical part of the network that has a bandwidth restriction (e.g. an ADSL line running at 600kbs) or a logical 'QoS point' (e.g. a customer has purchased a maximum of 1Mb/s of simultaneous VoIP calls). Each LBL has a maximum count associated with it. This is the maximum amount of bandwidth for calls available over the LBL.

The logical network model is a tree structure made up of LBLs and NATs according to the following rules (a generic term used to represent a LBL or NAT is network zone or zone; middlebox (MB) was used in SN07):

- A zone can be either an LBL, a NAT or a composite NAT & LBL at the same time.
- A top level zone must be connected to a non-bandwidth constrained 'core network'.
- A zone can have only one parent zone (closer to the core network) or the core network.
- A zone can have any number of children (subject to the maximum number of zones that may be datafilled per GWC).

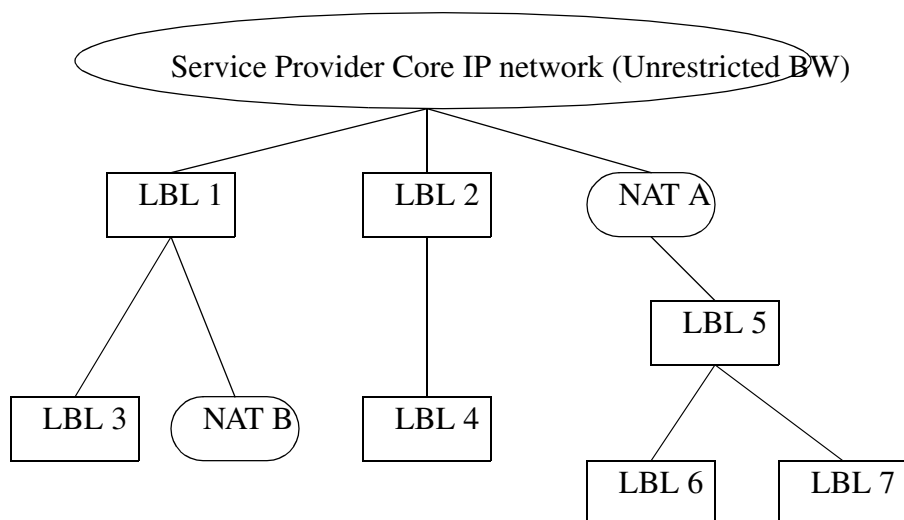
These rules mean that:



- There can be no circular network paths.
- There can only be one route from a particular zone back to the core network

This logical model of the network must contain the key connectivity routes in the modeled network. E.g. If a set of duplicate routes exist between 2 zones, they must be modeled as one link, not two, as otherwise the network VCAC capacity counting will not be accurate.

Figure 2, Sample VCAC network model



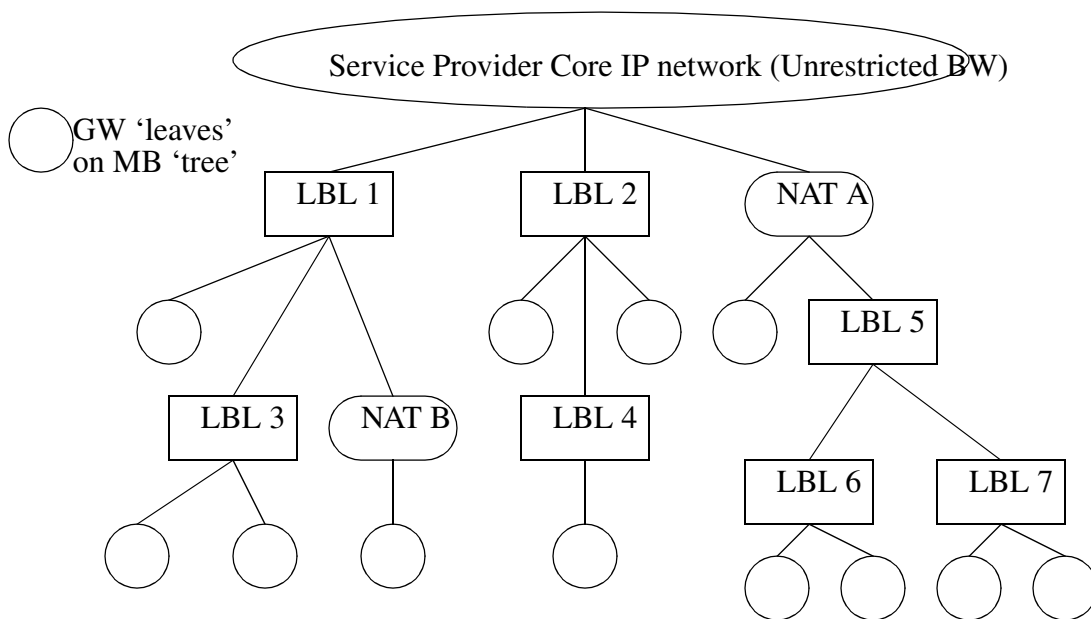
#### Adding GWs to the Model

GWs can be added to any zone in the logical model. A zone can have any number of GWs hanging off it. This is usually described as having GW 'leaves' on the zone 'tree'.

**Note:** PVG and UAS/AMS GWs are assumed to be within the core network. Similarly, Interdomain SIP-T trunks are assumed to start and finish in the core network

This means that any GW will have a single path through the model to the core network, and to any other GW that is within the model.

Figure 3, GWs attached to the zone network model



#### Network VCAC

Network VCAC works by calculating the path between the originating and terminating GWs, looking at the negotiated codec and ptime for the call and checking that each LBL in the path has sufficient resources for the call to be set up. If so, the call proceeds as normal, if not the call is released and a user provisionable treatment (which must be a tone) is applied to the originator. The terminator has not reached a ringing stage.

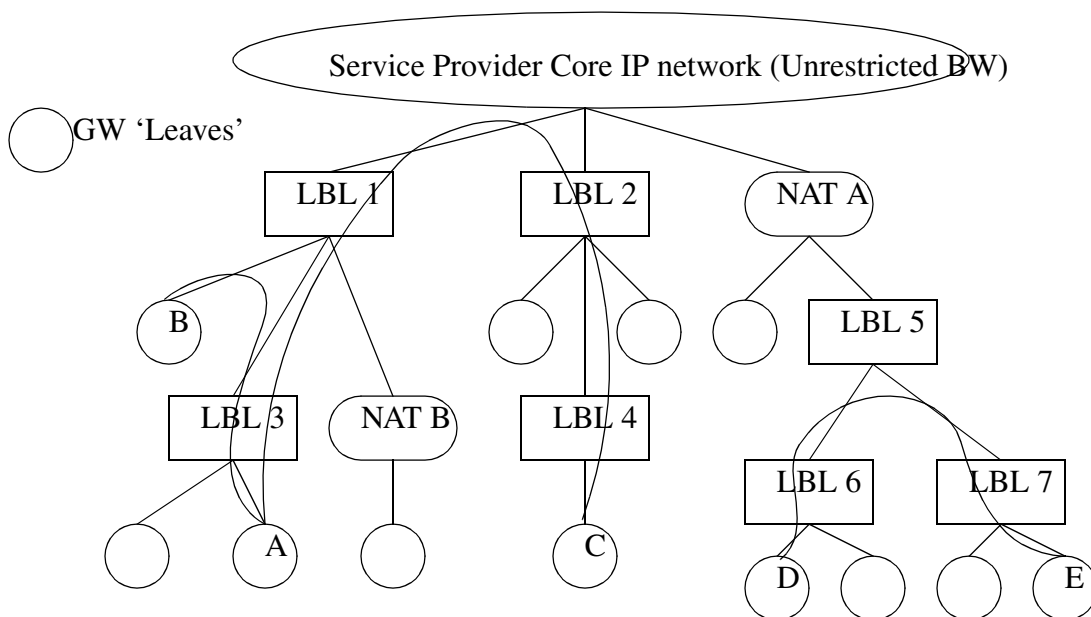
**Note:** Network VCAC uses the real, negotiated codec for the call. There are exception for certain call types (e.g. fax, modem) that are detailed below.

**Note:** Only the zones on the path are used - resources are not always used all the way to the core network if there is a shorter route through the network.

For example in Figure 4 below:

- An A-to-B call uses resources on LBL 3. LBL 1 is not used even though it is a part of the zone chain as the path between the GWs does not use it.
- An A-to-C call uses resources on LBL 3, LBL 1, LBL 2 and LBL 4. All the zones in the originator and terminator chains are on the GW path.
- A D-to-E call uses resources on LBL 6 and LBL 7. They are both behind the same NAT so no Media proxy is required.

Figure 4, VCAC path finding

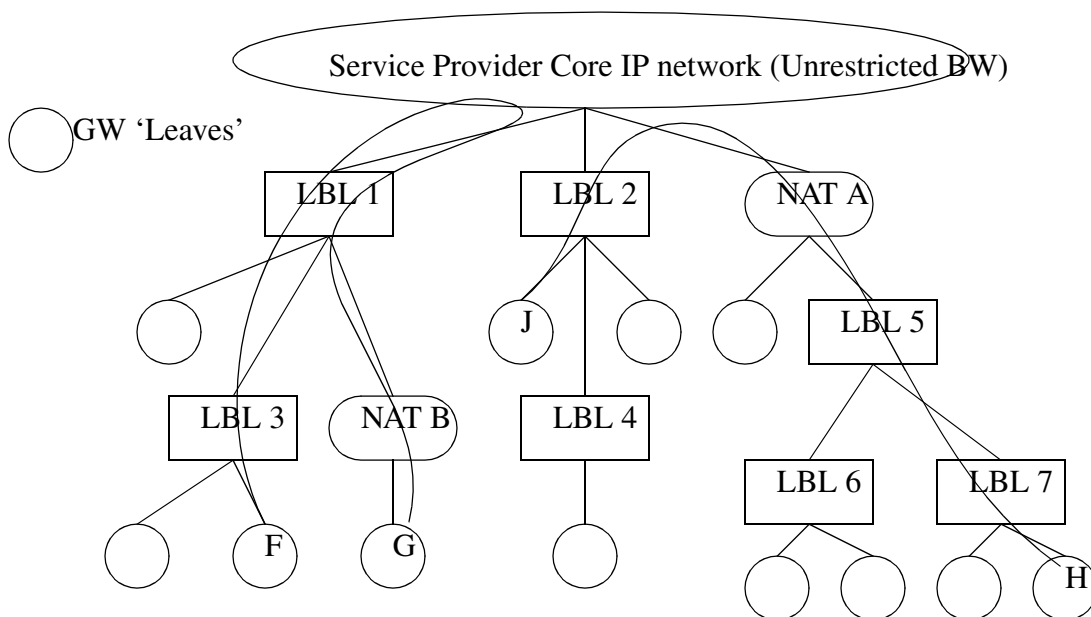


If there is a NAT zone on the call path then the call must extend as far as a Media Proxy (MP) (as described in ACT.89007980). These are located in the core network, so both the originator and terminator must use resources up to the core network, even if there is a shorter path between them.

Figure 5 below has examples of path finding when there is a NAT on the path between the GWs.

- An F-to G call uses resources on LBL 3 and LBL 1. LBL 1 has two call flows on it as both the originator and terminator need to use it to reach the Media Proxy (MP) in the Core network
- A H-to-J call uses resources on LBL 7, LBL 5 and LBL 2. This call will require a MP but the path between the GWs already traverses all the zones in the chain so there is no need to change this.

Figure 5, VCAC path finding through NATs



Basic VCAC is controlled by state SOC order code CS2Q0002. This has two states:

- ON, which will display ON and have VCAC enabled.
- OFF, which will display IDLE and will disable VCAC.

This SOC option also controls Network VCAC. It has to be in the ON state for Network VCAC to be usable.

In addition to the SOC option, Network VCAC is also controlled by a Service enabled flag, provisioned from the CS2M as part of feature ACT.A00007242CS2M, Network VCAC topology Provisioning.

#### Treatment

When a call fails due to VCAC failure (i.e. not enough bandwidth on the LBL to carry the call), an NBLN treatment is applied to the originating agent of the node. This can be complex to datafill particularly in a network scenario where the originating agent of the switch is a trunk. There are some caveats relating to SIP-T trunking below, and some limitations relating to services in the restrictions section at the end of the document.

For line originations that are blocked by VCAC a LINE138 log is produced with the treatment set to NBLN. For trunk originations that are blocked by VCAC a TRK138 log is produced with the treatment set to NBLN.

Note that NBLN can be generated by TDM peripherals which experience congestion but are still capable of call processing. This can also be generated by MG9K peripherals that experience congestion on intraswitched calls. The logs identify the originating parties and the dialed digits so it is possible to identify which set of circumstances has produced it.

#### Treatment Datafill

The significant tables are TMTCNTL, TMTMAP and FLXCMAP.

Table TMTCNTL is used to identify treatments to be played to lines. It is made up of several subtables, dependant on datafill. Each of these subtables must have the following tuple

NBLN Y S <tone>

NBLN is the treatment, Y signals that the event must be logged, S means the tone is defined by a CLLI and <tone> is the preferred tone, identified by the telco, to be played to the user. This <tone> can be a standard tone, e.g. T120 or a custom tone defined through table TONES, e.g. CONGESTION.

**Warning:** This MUST be set to a tone. Setting this to an announcement can result in a treatment loop as there is insufficient bandwidth to play the announcement.

Table TMTMAP is used to map signalling protocol and treatment pairs to a trunk release cause. These are used to signal to the previous node that this switch has rejected the call. They must be added for each signaling protocol used on trunks on this node. There is no dedicated VCAC release cause for any protocol, however each protocol does contain a number of release causes that are appropriate for VCAC. It is up to the telco to identify a release cause that will map into their signaling network. Examples of the TMTMAP datafill are:

Q764 NBLN ALLBC ISUP NOLOCAL NORMUNSP LOCLNET Y

Q767 NBLN ALLBC ISUP NOLOCAL NORMUNSP LOCLNET Y

Q931 NBLN ALLBC PRI NOLOCAL NORMUNSP LOCLNET Y

In these examples, Qxxx NBLN is the protocol pair, NOLOCAL indicates the treatment should not be played locally, NORMUNSP is the release cause and the ending Y signals the treatment should be logged.

The examples above will send Normal Unspecified as the release cause to the originating node. The originator of the call will hear a treatment specific to that release cause, not the NBLN treatment used on the terminating node. It is up to the telco to arrange the mappings from the line treatment to tone and release causes to tone if they require consistent tones for both line and trunk NVCAC failures.

**Warning:** The treatment MUST NOT be played locally (NOLOCAL in the example above) if any of the trunks using this node are based on SIP or H323. This can result in a treatment loop as there is insufficient bandwidth to play the announcement.

**Warning:** The release cause MUST NOT allow immediate reattempts. If the terminating line/trunk is blocked a reattempt will create a release loop as a different incoming trunk member will be attempted.

Table FLXCMAP is used to map release causes to treatments. in our example above the release cause is NORMUNSP so an example might be:

NORMUNSP CCITT\_STANDARD RODR N

This will map the NORMUNSP to the RODR treatment. The RODR treatment will be used to index in to the TMTCNTL tables to identify what the user hears. In this example the originator is not guaranteed to hear the same tone (for RODR) as they would for a local NVCAC failure (for NBLN).

**Note:** In these multi-node scenarios it is up to the telco to configure the signaling to ensure the NBLN treatment can reach the originator. If any of the nodes do not support NVCAC (e.g. MCS5200) or do not have the SOC enabled (not configured or running pre-SN07 load) it may not be possible to get the NBLN treatment in all scenarios. The originator will receive a treatment based on the release cause the reaches the originating node instead.

**Note:** If the originating gateway does not support the release cause or the audible signal (e.g. MGCP, H.248) that it is mapped to, the end-user may not hear any tone when the NBLN treatment is provided.

**Note:** The datafill above is an example only. There are regulatory requirements for some aspects of the behavior of signaling links and each customer may have different requirements for the mapping of release codes to treatments and for the management of their signaling network.

#### Inter-domain SIP-T vs. Intra-domain SIP-T

When a SIP-T call is blocked by VCAC, the release could be initiated locally or from the switch on the other end of the trunk, depending on whether the trunk is intra-domain or inter-domain.

In the case where the SIP-T trunk is intra-domain, we assume that the switch on the other end of the trunk understands VCAC. So on a call where the originator is behind an LBL with not enough bandwidth to carry the call, we would let the call continue. This is because, the terminator could be behind the same LBL as the originator, hence eliminating the need to use the failing LBL, and therefore the call can be completed successfully. On the other hand, if the terminator is not behind the same failing LBL as the originator, at that point

the call would then be blocked. A release message would be sent in the backward direction using the release caused datafilled in TMTMAP for the NBLN treatment.

If the switch on the other side of the SIP-T trunk does not understand VCAC, then an inter-domain trunk should be used instead of intra-domain. Failure to do so, could result in a ring-splash/ringing problem when a call is blocked by VCAC. For example, the MCS5200 does not understand the VCAC extensions, so if it is configured with an Intra-domain trunk a person calling to it will hear ringing until answer, when they will be routed to treatment. This is because the MCS5200 uses slow start when it provides SDP. A GW that uses fast start over the same configuration would result in the originator hearing a ringsplash before being routed to treatment.

In the scenario where the SIP-T trunk is inter-domain, we assume that the far end switch does not understand VCAC. Therefore, any inter-domain SIP-T call originating from a gateway behind a low bandwidth link with not enough bandwidth to carry the call will be blocked before leaving the originating switch.

## 1.4 Migration from Basic VCAC to Network VCAC

The resource usage database in Network VCAC is located on the SPC, whereas it is on the GWCs in Basic VCAC. Sites that are already running Basic VCAC, and wish to migrate to Network VCAC, should follow the procedures outlined in this section to ensure the migration of the database is successful.

The migration from Basic VCAC to Network VCAC can be performed once the CS2000 has been upgraded to the SN08 software load. During the upgrade of the CS2000 software Basic VCAC will be operational. When the software upgrade is complete, the migration to Network VCAC can commence. Basic VCAC may be used for as long as desired following the upgrade before activating Network VCAC. Basic VCAC is supported for migration purposes from SN07 to SN08 and SN09. Support for Basic VCAC may be discontinued after these releases.

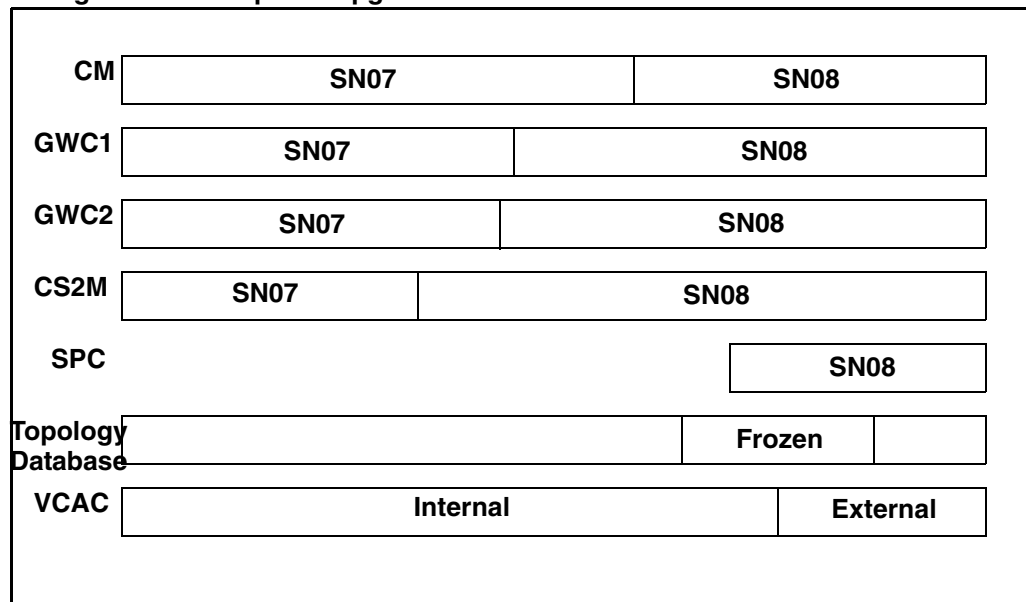
**Figure 5 Anticipated Upgrade Timeline**

Figure 5 illustrates the anticipated timeline over which the various switch components are upgraded. Initially the CS2M system is upgraded, as this is required prior to upgrading GWC cards. Following this, the GWC cards can then be upgraded. When the GWC cards are upgraded, they will continue to run the Basic VCAC software as before. The Network VCAC software in the new load will be dormant for the time being.

Following upgrade of all GWC cards, the core may be upgraded. After this, the switch has been upgraded to SN08, but the SPC and its associated external VCAC application have not been enabled. For customers not wishing to deploy these, this is as far as they need proceed.

Following verification of the upgrade of the main switch components to SN08, the switch to external VCAC can be considered. From now on, it is necessary to freeze the topology database and not allow any further changes to it until the migration process is complete. This is required in order to maintain consistency of the database during the migration.

When the SPC is commissioned, the topology model must be identically entered onto the SPC. This does not occur automatically, and should be done in accordance with the corresponding SPC documentation. The Basic VCAC software in use will still be using the database from CS2M, but the SPC will now contain a version in preparation for the switch to network VCAC. These two topology databases are separate and there is no automated synchronization process. Even after this procedure is complete, and topology changes are again allowed, care must be taken to ensure that both remain up to date.



Next, the SPC should be provisioned into the CS2M system, but Network VCAC not enabled. This will cause the GWCs to establish connections to the SPC. At this stage, it should be ensured that all is well with the SPC, that it's TCP links to the GWC are up, and that no alarms have been generated.

The switch to Network VCAC is controlled by the Network VCAC flag in CS2M. When Network VCAC is enabled via this option, the GWCs will cease to run Basic VCAC, and switch to using the SPC for VCAC policy decisions. Due to the significant change to call processing, it is recommended that the changeover should be performed at a quiet time, when few calls are in progress. Also, the Network VCAC software will not be aware of LBL resource usage of calls in progress at the time of the cutover. This anomaly will be cleared as these calls terminate.

If, for some reason, it is desired to revert to Basic VCAC, the Network VCAC option may be disabled in CS2M. The GWCs will then use revert to Basic VCAC and, as previously, use the topology model from CS2M. LBLs which are provisioned into SESM while Network VCAC in 'ON', cannot have VCAC correctly applied to them if the system is then reverted to Basic VCAC. Therefore, LBL provisioning should only be carried out once Network VCAC software has soaked for a sufficient length of time.

**Note:** Both the SPC and CS2M topology databases must be manually kept synchronized following the switch to Network VCAC. Failure to do this could result in malfunction of the feature.

## 1.5 Step-by-step Migration Procedure

This section describes the migration procedure in a step-by-step fashion. This is in anticipation of it being used to prepare an official MOP procedure document.

### 1.5.1 Purpose

This procedure describes how to convert a switch already running Basic VCAC with a particular topology, to run Network VCAC with the exact same topology. If any changes are required to the topology, e.g. new gateway associations or LBLs, then this must be done either before or after execution of this procedure.

Use of this procedure is not required for green-field installations of Network VCAC or for offices upgrading to SN08 Basic VCAC.

### 1.5.2 Documentation used by this procedure

The procedure references the following documents. Please ensure that you have them to hand and are familiar with them before starting.

SPC Provisioning Guide

A cook book is available at: <http://livelink-asiapac.us.nortel.com/asiapac/livelink.exe?func=ll&objId=1729558&objAction=browse&sort=nameRegards>. This has been captured in the Policy Controller Configuration Management NTP.

#### SESM Provisioning Guide

FN A00007242 (PLS FMDOC) “SESM support for SPC topology”. The corresponding customer documentation should be used when it is available.

#### Basic VCAC Documentation

FN A00002730 (PLS FMDOC) - Basic VCAC. The corresponding customer documentation should be used when it is available.

### 1.5.3 Pre-requisites

1. All switch components must be upgraded to SN08 load line-up prior to network VCAC activation. Basic VCAC is supported over the upgrade from SN07 to SN08 load line-ups.
2. The VCAC SOC option will be active, as the switch is already running Basic VCAC. Refer to Basic VCAC documentation.
3. SPC should be installed and commissioned with SN08 load. Refer to SPC Provisioning Guide. Check for no DQoS connection alarms or other suspicious logs on SESM or SPC.
4. Basic VCAC topology must be frozen prior to start. No topology changes are allowed during the procedure. Selection of Network VCAC is switch wide. It is not possible to run part of the switch on Basic VCAC and part on Network VCAC. Please ensure that the provisioned topology will be sufficient for your needs for the whole duration of the procedure before proceeding. Refer to Basic VCAC Documentation for further guidance.
5. Topology details for basic VCAC need to be available to migration engineers. This information is likely to be available through customer network data. It is also available in the basic VCAC configuration in CS2M. Refer to Basic VCAC Documentation.
6. It is recommended that this procedure should be executed during a time when call processing is at a minimum.

### 1.5.4 Network VCAC Activation

1. Provision basic VCAC topology (from pre-requisite step 5) in SPC. Please refer to SPC Provisioning Guide.

NB: It is critical to ensure that the VCAC topology provisioning in the SPC matches the CS2M topology before Network VCAC is activated otherwise access control will not function correctly. In SN08 this is not checked automatically and needs to be validated by the upgrade engineer.

2. Activate Network VCAC flag in CS2M. Please refer to the SESM Provisioning Guide for further details on this.

NB: When Network VCAC is activated, all new calls will trigger bandwidth management through the SPC. There is no transfer of current bandwidth status between Basic and Network VCAC. This means that the SPC will have no knowledge of existing calls set-up under basic VCAC. This may lead to temporary degradation of voice quality on some calls. As existing calls are cleared, potential problem will be removed.

3. Verify call processing to confirm network VCAC is functioning correctly. Check for any suspicious logs on SPC, GWC or CM. We suggest allowing the system to soak for some time to allow any potential errors to come to the surface.

4. Once you are fully satisfied that the system is functioning correctly, topology changes may be made. Note that the provisioning restrictions have changed between SN07 and SN08. Specifically, in SN08 it is possible to mix agent types (IAD, CICM, H323) behind a common link. **These changes will not survive a rollback correctly, so the topology freeze must extend long enough for the VCAC behavior to be thoroughly tested and soaked in.**

5. Ensure that all topology changes are entered identically on both CS2M and SPC databases. These must both be manually kept in sync going forwards, otherwise access control will not function correctly. Refer to both SESM and SPC Provisioning Guides.

### 1.5.5 Network VCAC activation without Basic VCAC

The pre-requisite steps 1, 2 and 3 will be complete. I.e. the switch has been upgraded, the VCAC SOC is enabled, the SPC is installed and configured.

1. Provision the required treatment datafill as described in this document. In the migration scenario this would have been present for Basic VCAC.

2. Activate Network VCAC flag in CS2M. Please refer to the SESM Provisioning Guide for further details on this.

3 Start configuring the topology on both SESM and the SPC. These must be manually kept in sync, otherwise access control will not function correctly. Refer to both SESM and SPC Provisioning Guides. Once active gateways are associated with the topology in SESM, confirm network VCAC is functioning correctly. Check for any suspicious logs on SPC, GWC or CM. We suggest allowing the system to soak for some time to allow any potential errors to come to the surface.

### 1.5.6 Network VCAC Rollback

This procedure describes how to abort the switch to Network VCAC, by rolling back to Basic VCAC. It should only be carried out while the topology database

is frozen, i.e. up until step 4 of the activation procedure. If this is not the case, topology mismatches may occur, leading to basic VCAC functioning incorrectly.

1. Deactivate Network VCAC flag in CS2M. Please refer to the SESM Provisioning Guide.

NB: Once network VCAC is deactivated, bandwidth will be managed on the GWC. Bandwidth status will not be transferred from the SPC to the GWC. This may lead to temporary degradation of voice quality on some calls. As existing calls are cleared potential problem will be removed.

### **1.5.7 VCAC Deactivation**

In the event of a serious VCAC malfunction, the VCAC SOC may be disabled. This will disable all VCAC functionality - Network and Basic VCAC. When this option is taken, no access control will be performed by the switch. The VCAC SOC option is described in the Basic VCAC Documentation.

## **1.6 Hardware Requirements or Dependencies**

Network VCAC requires a Session Policy Controller installed and configured as per Act A00007393SPC.

## **1.7 Software Requirements or Dependencies**

Standard SN08 CS2K software components are required.

## **1.8 Limitations and restrictions**

The VCAC architecture has some provisioning limits that are enforced by the the provisioning system. These are:

1. There is a maximum of 5 network links between a GW and the Service Provider's core network.
2. VCAC only uses the negotiated values for a call. This means that fax and modem upspeeding to G711 from G729 will not be modelled. Similarly T.38 fax calls will not change the modelled bandwidth for the call.
3. There is a requirement that voice traffic is prioritized over the data traffic. Furthermore, VCAC does not model voice and non-SPC controlled data traffic on the same LBL. This has to be done by careful modeling of the logical network, as a part of the system engineering.
4. Interactions with codec negotiation. In a network configured to use G729 and the preferred codec and G711 as the default codec the originator offers a list of codecs to the terminator who chooses which one the call will use. Initially the NVCAC application assumes the worst case (G711) at the originator until the negotiated SDP is returned by the terminator. However, this means that it is not always possible to get the expected number of G729 on a link. This is difficult to detect as it is difficult to guarantee that all calls will negotiate to G729.

## 1.9 Logs and Operational Measurements

No new logs or OMs are introduced by this feature.

### 1.10 Interactions

VCAC potentially affects any call. If there is insufficient resources for a call or call leg to complete then the call will be released, and the user directed to a treatment. Some specific service examples are described in the Service Interactions section below.

VCAC can deny call admission whenever the speech path changes, so the main scenarios are:

1. **Call Origination.** After the digits have been dialed and the CS 2000 attempts to establish a speech path prior to ringing/ringback VCAC can deny admission to the call. This is the main VCAC scenario.
2. **Call Hold.** The bearer path is dropped for a call placed on hold, whether as a call hold service or as a step in another service such as 3WC or consultation transfer. If other calls have consumed the available resources then an attempt to retrieve the held call will fail.
3. **Call Transfer.** The bearer path is changed after it has been set up. This can be caused by services such as call transfer, CFNA, 3WC. IN services use this functionality by connecting a call to announcements before routing to other destinations. This fails if there is a LBL in the new path without resources for the new call leg.
4. **Calls that ring before negotiating the speech path.** Examples of these service are non-pilot members for simring and pre-answer call waiting attempts. In these cases the application only calculates the bandwidth on answer, so the call will be denied then if there is no bandwidth.

On call denial VCAC will clear down the call that would overload the LBL. **Service failure handling will be on a best effort basis, i.e. there is no attempt to retry or change to a less demanding codec.** See below for more details.

**Note:** On trunk calls that support suspend/resume bandwidth is maintained for the duration of the suspend/resume timer. This means that some of the service behavior described here will vary if some or all of the parties are trunks.

### 1.11 Service restrictions and limitations

Bearing in mind the best effort approach to services, some limitations and restrictions are summarized here.

#### 1.11.1 Lawful Intercept (LI)

There are a number of restrictions for configuring LI:

1. The parties monitoring for the Law Enforcement Agency (LEA) must not be configured behind any LBLs. This is similar to the restriction for NAT traversal, that the parties monitoring for the LEA must not be configured behind any NAT device. If this is not followed then these LEA monitoring parties can ring but not get speech path.
2. C-tone may be interrupted for dedicated LI where a call leg is denied by VCAC. Similarly, there may be ringspash on the LEA monitoring parties for switched LI when a call leg is blocked by VCAC.
3. There is a transparency issue for cases where the subject parties are behind a common, full, LBL. In this case the two people can call each other if they are not subject to LI, but will be blocked if one of them is being monitored, as the call is extended to the LI replicator device. An extreme example is when both parties are on the same GW, and so would never be blocked, thus making LI monitoring very obvious. This can be solved by the Public Network Interception (PNI) feature which will prevent calls from being monitored unless the Law Enforcement Agency (LEA) chooses to take the risk of the monitoring action being discovered.

### **1.11.2 Emergency and other priority calls**

There is no guarantee that any emergency or priority calls will get through. They are subject to the same VCAC process as any other call type. They are NOT given any extra precedence over any other voice traffic by the NVCAC application.

### **1.11.3 Examples of service behavior**

If there is sufficient bandwidth for a service to proceed the NVCAC application has no impact on it. If there is insufficient bandwidth then one or more call legs will not succeed and the service attempt will fail. This section provides some examples of common service failures and how they behave. This is NOT an exhaustive list of service. It is NOT an exhaustive list of ways in which each service can fail.

1. Three Way Call. This can be blocked at a number of points - when retrieving someone from hold, on contacting the second party and when the three members are being connected to the conference bridge. If the second party cannot be reached the controller hears NBLN treatment and can flash back to the first party. If one party cannot reach the conference bridge due to bandwidth restrictions then the controller receives 3 seconds of NBLN treatment to alert them to the problem before being connected to the other party.
2. Call Waiting. Transferring to a waiting call will only apply NVCAC when the switch to the waiting call occurs. This can fail as there may not be sufficient bandwidth for the two parties to reach each other. In this case the waiting party hears ringing, then NBLN treatment and the called party hears 3 seconds of BUSY before being reconnected to their original call.

3. **Call Hold.** A party put on hold releases its bandwidth until a reconnect attempt is made. This reconnection can fail if other calls have consumed the bandwidth in the meantime. In this case the party on hold drops to dialtone and the retrieving party hears NBLN treatment.
4. **Call forward No Answer.** This can fail when the call is made to the first party or when the call is forwarded on to the second party. If the failure occurs on the connection to the second party then the originator will have heard several seconds of ringing before receiving the NBLN treatment.
5. **Music On Hold.** Music on hold is played when a party is put on hold. If there is insufficient bandwidth for the on hold part to reach the audio server then the held party will drop out of the service and hear dialtone.
6. **SIMRING.** SIMRING only reserves bandwidth to the pilot DN. If there is insufficient bandwidth to reach the pilot DN then ring splash is heard on the non-pilot members. If there is enough bandwidth to reach the pilot, but the call is answered on a non-pilot DN without enough bandwidth then the originator hears NBLN treatment followed by DISC treatment, the answering party drops back to dialtone.
7. **CICM EBS secondary DN services.** The CICM secondary DN service can maintain two bearer channels. This means that some service failures will not occur because the speech path is maintained and the bandwidth is not released. However, holding multiple bearer channels will exhaust the bandwidth on links faster.
8. **Meet-Me Conference.** The Meet-Me service applies a short ring tone to existing conferees when a party attempts to join, even if NVCAC actually blocks that party. The denied party hears NBLN treatment but existing conferees hear no indication that the joining attempt failed. If the NVCAC-denied party was first or second to dial into the Meet-Me bridge, the remaining party is disconnected as if the conference had ended normally. Calls to a Meet-Me bridge denied by NVCAC are recorded as answered but with no elapsed time (i.e. instant disconnect) for billing purposes.

This is a sample list of service behavior when NVCAC denies calls. Other service scenarios will behave in similar ways.



## 1.12 Glossary

| Term   | Description                    |
|--------|--------------------------------|
| AMS    | AudioCodes Media Server        |
| CS2000 | Communication Server 2000      |
| GW     | Gateway                        |
| GWC    | Gateway Controller             |
| LBL    | Limited Bandwidth Link         |
| LEA    | Law Enforcement Agency         |
| MB     | Middlebox                      |
| MGCP   | Media Gateway Control Protocol |
| MP     | Media Proxy                    |
| NAT    | Network Address Translator     |
| QoS    | Quality of Service             |
| SPC    | Session Policy Controller      |
| UAS    | Universal Audio Server         |
| VCAC   | Virtual Call Admission Control |
| VoIP   | Voice over IP                  |
| VPN    | Virtual Private Network        |

## 1.13 References

1. Session Policy Controller (FN) - <http://livelink-asiapac.us.nortel.com/asia-pac/livelink.exe?func=ll&objId=1534787&objAction=browse&sort=nameRegards>
2. Basic VCAC on CS2K - DDOC A00002730 in PLS FMDOC
3. Network VCAC COPs Enhancements - DDOC A00007397 in PLS FMDOC
4. Network VCAC Maintenance & Upgrades - DDOC A00007399 in PLS FMDOC
5. Network VCAC Topology Provisioning (A00007242) - under Documents / SN08 on <http://ptm.us.nortel.com/>



***Product = CS 2000***

## **A00007404--IEMS Security Serialized Patching**

### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

### **1.2 Description**

This feature ensures that only one IEMS security module component is restarted at a time with respect to patching. Specifically if a request is initiated from the NPM GUI, CLUI, or scheduler to restart all IEMS security module components, separate requests will be queued and executed serially.

To ensure the NPM server serializes IEMS security module restart requests for patching, a new platform type is implemented by this feature. The new platform type value is 'SCTY' and can be queried as part of report generation from the NPM GUI or CLUI.

### **1.3 Hardware Requirements or Dependencies**

None.

### **1.4 Software Requirements or Dependencies**

None.

### **1.5 Limitations and restrictions**

During upgrades into SN08 from older releases, a PSE that is upgraded to SN08 will not be able to send its devices or be available for patching to an NPM that is SN08 or older. This configuration and patching support is not changed from the previous policy in SN08.

If patching is required to any components at a version of SN08 and the NPM has not been upgraded, the script utility called "patchUpToDate" should be used to patch those components on a given machine.

### **1.6 Interactions**

### **1.7 Glossary**

## ***Product = CS 2000***

### **A00007417--Ethernet link overload Control** ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS

#### **1.2 Description**

With the significant increase of the call processing power introduced by the XA-Core architecture, messaging resources including the bandwidth for the link and real-time, can be exhausted by the high call processing rate.

Without protection to the messaging resources, critical messages can be dropped due to the unavailable messaging resources.

The purpose of this activity is to provide a mechanism to prevent sustained over-utilization of Ethernet links and notify existing System Overload Control (SOC) which reacts by interacting with the peripherals to reduce the rate of incoming new originating calls.

#### **1.3 Hardware Requirements or Dependencies**

N/A

#### **1.4 Software Requirements or Dependencies**

Feature XA-Core IOCAP Monitoring toolset: A00006693 provides OMs of interest.

#### **1.5 Limitations and restrictions**

Ethernet link overload control is only applicable to XA-Core.

Peripherals must contain software which reacts to the core overload signal.

#### **1.6 Interactions**

This feature provides monitoring of the Ethernet messaging link. When the level of messaging through the Ethernet link is approaching the maximum capacity, it applies throttling through the System Overload Control (SOC) function.

## 1.7 Log

**Table 1** New or modified logs

| Log name | Log number | NEW/MOD/DELETED | System (SOS/UNIX) |
|----------|------------|-----------------|-------------------|
| CAP      | 101        | MOD             | SOS               |

## 1.8 Glossary

N/A

## 2.1 Fault Management for A00007417

### 2.2 Logs

Log Title/Log ID: CAP Capacity Data/ CAP101

#### 2.2.1 Formats

**Figure 1** Formats of log reports

```
<office name> CAP101 <date> <timestamp> INFO CAPACITY_DATA  
  
UTIL <n> ENGLEVELE <BELOW/ABOVE> CCOVRD <OFF/ON>IOOVRD  
<OFF/CMIC-ON/ETHR-ON/CMIC-ETHR-ON> PE_SC <YES/NO>
```

**Figure 2** Sample log reports

```
VENUS21AO CAP101 SEP07 09:42:35 8700 INFO CAPACITY_DATA  
  
CATMP/HR 251881 SMS/HR 180 VLR_UPD/HR 331200 CAP 127%  
  
ENGBHCA 196972 CCOVRD ON IOOVRD ETHR PESD NO
```

#### 2.2.2 Explanation

Description: This feature impacts the existing CAP101 log. Since this feature introduces the Ethernet overload control, the CMICOVLD field will be changed to IOOVRD. IOOVRD indicates the IO messaging link utilization status, including CMIC and Ethernet Link.

### 2.2.3 Field descriptions

Table 2 Field descriptions

| Field  | Value     | Description                                                 |
|--------|-----------|-------------------------------------------------------------|
| IOOVRD |           | Indicates the CMIC and Ethernet link overloading condition. |
|        | OFF       | When CMIC & ETHR are running under link capacity.           |
|        | CMIC      | When CMIC link is over utilized.                            |
|        | ETHR      | When ETHR link is over utilized.                            |
|        | CMIC-ETHR | When CMIC and ETHR links are over utilized.                 |

#### 2.2.4 Action

If the logs indicate IO link overload frequently, then it may suggest upgrading the IO capacity service hardware.

#### 2.2.5 Associated Operational Measurements or Performance Measurements

IOCAP OM group has registers.

#### 2.2.6 Additional information

Please refer A00006693 FN.

### 2.3 Related documentation

***Product = CS 2000***

## **A00007424--Alarm Enhancements on SAM21**

***Excerpts from the Design Summary***

### **1.1 Applicable Solution(s)**

PT-IP, UA-IP, IAC, IAW, PT-AAL2

## 1.2 Introduction

This document covers the SAM21 SC software robustness on following areas:

- Alarming of locked IO cards
- Alarming of recovering IO cards
- Alarming of the connectivity loss of boot server
- Alarming of the loss of NFS mount

## 1.3 Alarming of Locked Application Card

### 1.3.1 Design Solution

On the SAM21 Shelf Controller, the Salus application is responsible for all IO OAM actions and alarms should failures be detected during an OAM action. Following the infrastructure of IO card alarming, this feature will add Alarm ID 56 - **underlyingResourceUnavailable** and Alarm Type 4 - **Processing Error** for each application card. The severity of the alarm is **minor**, this will have yellow color high-lighting on the card on the SAM21 Manager GUI.

When a card is locked successfully, this alarm will be raised against the card, a trap (Informs) will be sent to the SAM21 Manager with following data:

- PhysicalIndex - the slot number of the card seats in plus 33,
- AlarmID - 56
- TimeStamp - the time when the alarm is raised
- AlarmType - 4
- Severity - 1
- DetailedInfo - "This application card is unavailable"

Considering during upgrade and roll back scenario, Salus will not alarm locked application cards when the Shelf Controller is in the process of upgrade from pre-SN08 release to SN08 release or plus.

## 1.4 Alarming of Application Card being Recovered

### 1.4.1 Design Solution

Same as above, Salus will be used to alarm application card being auto-recovered.

When a card is being recovered by NSS\_BOOT\_AUDIT, it sends a message to Salus to indicate the start and finish of the recovery, Salus will raise a major alarm against the card and clear the alarm after the recovery is successful done.

The alarm is raised through a trap (Informs) with following data:

- PhysicalIndex - the slot number of the card seats in plus 33,

- AlarmID - 56
- TimeStamp - the time when the alarm is raised
- AlarmType - 4
- Severity - 2
- DetailedInfo - “This application card is unavailable and being recovered”

## 1.5 Alarming of Boot Server Unavailable

### 1.5.1 Design Solution

This is a straight-forward extension of the other forms of alarming the loss of network elements. Hubble will ping the Boot Server address and will keep Mama informed of its status. Mama will raise an alarm based on the severity of the issue. And will clear the alarm if Hubble reports that it can be reached.

## 1.6 Alarming of NFS Mounts down

### 1.6.1 Design Solution

Salus will be modified to check the mounts periodically. It will attempt to remount any mounts found to be down, and raise an alarm for any mounts that remain down after the check. Only the mounts for provisioned applications will be checked.

Salus will schedule a reminder with Chronos, so that Chronos will send a message to Salus to kick off the check every 10 minutes. When the NFS mounts down is detected, the interval will be decreased to 1 minutes.

The recover script is currently responsible for the mounting the directories on start-up. It will be modified so that it can be called to check the mounts. This will allow the knowledge of the mount points to remain in one place.

## 1.7 Glossary

| Term | Description                               |
|------|-------------------------------------------|
| CS2K | Communication Server 2000                 |
| cPCI | Compact Peripheral Component Interconnect |
| EM   | Element Manager                           |
| GUI  | Graphical User Interface                  |
| OAM  | Operations, Administration, Maintenance   |
| SAM  | Service Application Module                |
| SC   | Shelf Controller                          |
| SDM  | Succession Data Manager                   |
| GWC  | Gateway Controller                        |

***Product = CS 2000***

## **A00007464--SBA PacketCable Event Messaging**

***Functional Description***

### **1.1 Applicable Solution(s)**

IAC, DMS

### **1.2 Description**

SN08 PacketCable Solution requires support for two entirely new billing streams. These streams are Accounting (PCEM) and LI (PCES).

This SN08 Activity A00007464(SBA PacketCable Event Messaging) provides modifications to SBA functionality on the 3PC-core as well as CBM to ensure end-to-end billing data delivery for Accounting (PCEM) and LI (PCES) streams.

It should be noted that valid PacketCable Product configuration is 3PC-core connected to CBM. There are no requirements to support this activity on any other configurations such as Xacore, Brisc, or SDM. Consequently, testing will be concentrated on 3pc/cbm configuration. This activity will provide following functionalities:

- CBM-3PCcore: Provides End-to-end delivery of billing data for PCEM stream
- CBM/3PC-core: Provides End-to-end delivery of billing data for PCES stream
- CBM/3PC-core: Will provide PCEM throughput capacity of 225 KBHCA(10 events / call, 200 byte average event) as per 'SN08 PacketCable EM requirements for Billing'.
- CBM/3PC-core: Will provide PCES throughput capacity of 0.2 KBHCA(10 events/call, 200 bytes average event)
- CBM-3PCcore: Will provide latency for PCEM stream as per 'SN08 PacketCable EM requirements for Billing'. This feature will provide latency of 2.5 seconds from Event generation to SBA CBM disk.
- CBM-3PCcore: Will provide latency for PCES stream as per 'SN08 PacketCable EM requirements for Billing'. This feature will provide latency of 2.5 seconds from Event generation to IAA software.
- CBM: Configuration of PCEM stream from billmtc;confstrm;add level
- CBM: Configuration of PCES stream from billmtc;confstrm;add level
- CBM: query of PCEM stream from billmtc;confstrm;list level
- CBM: query of PCES stream from billmtc;confstrm;list level
- CBM: modification of already provisioned parameters for PCEM stream from billmtc;confstrm;change level. Note that modifications are not allowed if the stream is active.
- CBM: modification of already provisioned parameters for PCES stream from billmtc;confstrm;change level. Note that modifications are not allowed if the stream is active
- CBM: deactivation of PCEM stream from billmtc;confstrm;delete level
- CBM: deactivation of PCES stream from billmtc;confstrm;delete level
- 3PC-core: assignment of backup volumes for PCEM stream from mapci;mtc;appl;sdbil;addvol level
- 3PC-core: rejection of backup volumes configuration for PCES stream from mapci;mtc;appl;sdbil;addvol level
- 3PC-core: Activation of PCEM stream from mapci;mtc;appl;sdbil;post level
- 3PC-core: Activation of PCES stream from mapci;mtc;appl;sdbil;post level
- 3PC-core: query of PCEM stream from mapci;mtc;appl;sdbil;post pcem;query level
- 3PC-core: query of PCES stream from mapci;mtc;appl;sdbil;post pces;query level
- 3PC-core: display banner for BKUP and REC subsystem for PCES stream will be set to offl at mapci;mtc;appl;sdbil;post pces level



- 3PC-core: deactivation of PCEM and PCES streams from mapci;mtc;appl;sdbil;post level

### 1.3 Hardware Requirements or Dependencies

Following hardware is required for PacketCable Event Messaging Solution:

- 2 x NTRX51GZ (Call Agent Blades with 1.5GBytes RAM)
- 2 x NTRX51GT (72GBytes STORM-IA disks)

### 1.4 Software Requirements or Dependencies

This activity is dependent on following activities for end-to-end delivery of PCEM and PCES billing streams from the core:

- **A00007196:** PacketCable Event Messaging. Allows successful datafill of CRSFMT and CRSMAP tables for PCES and PCEM streams
- **A00007465:** Antedated Accounting Application (IAA). Ensures PCEM, PCES event messages are delivered downstream.

### 1.5 Limitations and restrictions

- Filtered streams not supported for PacketCable streams PCEM and PCES.
- Some existing commands (such as query, closec, amadump, sendfile, and listfile) are modified for PacketCable streams. These commands are detailed in the Configuration Section (CN).

### 1.6 Interactions

None

## 1.7 Glossary

| Term | Description                                         |
|------|-----------------------------------------------------|
| 3PC  | Third Party Core                                    |
| CBM  | Core Billing Manager                                |
| IAA  | Integrated Accounting Application                   |
| LI   | Legal Intercept                                     |
| PCEM | PacketCable Event Messaging (ie. Accounting stream) |
| PCES | PacketCable Electronic Surveillance (ie. LI stream) |
| SBA  | SDM Billing Application                             |
| SPS  | Sterling PacketCable Software                       |

## 2: Configuration for A00007464

### 2.1 Hardware and Software Requirements

This feature is dependent on actid A00007196 (SBA PacketCable Event Messaging). Namely, it assumes successful datafill of CRSFMT and CRMAP tables for PCEM and PCES PacketCable streams.

TABLE: CRSFMT

| KEY         | FORMAT         | DATADUMP | CDRSRCH       | ALARMS   | TIMERDMP | TIMERVAL |
|-------------|----------------|----------|---------------|----------|----------|----------|
| NIL         | NTFMT          | N        | NIL_FM        | N        | N        | 0        |
| AMA         | BCFMT          | N        | NIL_FM        | N        | N        | 0        |
| <b>PCEM</b> | <b>PCEMFMT</b> | <b>N</b> | <b>NIL_FM</b> | <b>N</b> | <b>N</b> | <b>0</b> |
| <b>PCES</b> | <b>PCESFMT</b> | <b>N</b> | <b>NIL_FM</b> | <b>N</b> | <b>N</b> | <b>0</b> |

TABLE: CRSMAP

KEY STREAM

|             |             |
|-------------|-------------|
| CAMA        | AMA         |
| LAMA        | AMA         |
| TOPS        | AMA         |
| <b>PCEM</b> | <b>PCEM</b> |
| <b>PCES</b> | <b>PCES</b> |

### 2.2 Initial Configuration

This activity spans across switch core (3pc, xacore, brisc) and the CBM (Core Billing Manager).

Following is recommended:

- On CBM:
  - PacketCable Accounting stream (PCEM) must be configured for 6 hours of IAA (Integrated Accounting Application) downtime. This amounts to a logical volume requirement of 8Gbytes for SBA.
  - PCEM stream must be configured so that it grows to maximum possible size 20Mbytes. i.e. File closure based on max number of bytes.

## 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

Entire section is not applicable

## 2.4 Upgrade Considerations

### 2.4.1 Dump and Restore (CM)

Although new field (EXPEDITE) is introduced in table SDMBILL, the upgrade scenario is handled through the reformat proc. This proc., on upgrade to CSP21(SN08), will convert old tuple appropriately.

### 2.4.2 Element Management Upgrade

Not applicable

### 2.4.3 Downgrade impact

None.

## 2.5 Data schema (DS) (CM, MIBS, RDB)

### 2.5.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/OLD/UNCHANGED) |
|----------------|--------------------------|-----------------------------------|
| SDMBILL        | CHANGED                  | UNCHANGED                         |

### 2.5.2 Table/MIB/Remote Database Schema information

#### 2.5.2.1 Name: SDMBILL (SDM Billing Table)

This table is modified to include one additional field named EXPEDITE.

##### 2.5.2.1.1 Functional description

- Extra field named EXPEDITE is introduced in table SDMBILL

- PacketCable streams PCEM and PCES needs to provide PacketCable Event Messages as per 'SN08 PacketCable EM requirements for Billing' specifications. This is accomplished through new EXPEDITE field. This field will be set to Y for PCEM and PCES streams, and set to N for legacy streams such as AMA, OCC, SMDR
- Table SDBMILL is dependent on table CRSFMT. If an entry is added to CRSFMT table, corresponding entry will be created in SDBMILL through table dependency proc.
- for each entry in SDBMILL table, corresponding stream is visible in mapci;mtc;appl;sdbmil;post level. Stream can be configured/activated/deactivated from this level
- If an entry is deleted from CRSFMT table, corresponding entry will be deleted from SDBMILL table through table dependency proc.
- EXPEDITE field in software controlled and is not editable

#### 2.5.2.1.2 Usage sequence and implications (CM Only)

There is no requirement to datafill table SDBMILL in any specific order

#### 2.5.2.1.3 Size

**Table 2 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory       |
|------------------------|----------------|----------------|-----------------------------|
| SDBMILL                | 1              | 15             | No additional memory impact |

#### 2.5.2.1.4 Fields/OIDs

NA

#### 2.5.2.1.5 Datafill example

The following example shows sample datafill for table SDBMILL

```

TABLE: SDBMILL
SDBMKEY SDBMACT SDBMSTAT  EXPEDITE  VOLUMES
-----
--
      NIL      OFF      Off      N          $
      AMA      ON       InSv     N      (F02LAMA1) (F17LAMA1) $
      PCEM     OFF      Off      Y      (F02LPCEM1) (F17LPCEM1) $

```

#### 2.5.2.1.6 Table release history update

Added field EXPEDITE to provide delivery of PacketCable Event Messages (billing data) to CBM.

#### 2.5.2.1.7 Supplementary information

None

### 2.5.2.1.8 Translation verification and other tools

SDMBILL does not use translation verification tools.

## 2.6 Service Orders (SO) (CM & SESM)

Entire section is not applicable

## 2.7 Software optionality control (SOC)

Not applicable

## 2.8 Element Management

### 2.8.1 CLUI Interface

No new commands are introduced by this activity. Behavior of addvol command has changed for PacketCable Electronic Surveillance (PCES) steam. See “Configuration Walkthrough” on page 1257.

## 2.9 User interface changes

No new commands are introduced by this activity. Behavior of addvol command has changed for PacketCable Electronic Surveillance (PCES) steam. See “Configuration Walkthrough” on page 1257.

## 2.10 OSSGate Interface Changes

Entire section is not applicable

## 2.11 Security

Entire section is not applicable

## 2.12 Configuration Walkthrough

### 2.12.1 Provisioning of PacketCable Accounting stream (PCEM)

- core: create Accounting stream (PCEM) by datafilling CRSFMT table

TABLE: CRSFMT

| KEY         | FORMAT         | DATADUMP | CDRSRCH       | ALARMS   | TIMERDMP | TIMERVAL |
|-------------|----------------|----------|---------------|----------|----------|----------|
| NIL         | NTFMT          | N        | NIL_FM        | N        | N        | 0        |
| <b>PCEM</b> | <b>PCFMFMT</b> | <b>N</b> | <b>NIL_FM</b> | <b>N</b> | <b>N</b> | <b>0</b> |

- core: Due to CRSFMT / SDMBILL table dependency, creation of PCEM entry in CRSFMT creates following entry in table SDMBILL

TABLE: SDMBILL

| SDMBKEY | SDMBACT | SDMBSTAT | EXPEDITE | VOLUMES                  |
|---------|---------|----------|----------|--------------------------|
| NIL     | OFF     | Off      | N        | \$                       |
| AMA     | ON      | InSv     | N        | ( F02LAMA1) (F17LAMA1)\$ |

**PCEM      OFF      Off      Y      \$**

- core: assign backup volumes to Accounting stream PCEM. This is done by issuing mapci;mtc;appl;sdbmil;addvol pcem f02lpcem1 f17lpcem1

TABLE: SDBBILL

| SDBKEY      | SDBACT     | SDBSTAT    | EXPEDITED | VOLUMES                          |
|-------------|------------|------------|-----------|----------------------------------|
| NIL         | OFF        | Off        | N         | \$                               |
| AMA         | ON         | InSv       | N         | (F02LAMA1) (F17LAMA1)\$          |
| <b>PCEM</b> | <b>OFF</b> | <b>Off</b> | <b>Y</b>  | <b>(F02LPCEM1) (F17LPCEM1)\$</b> |

- core: map calldata type PCEM to accounting stream PCEM by datafilling CRSMAP table

TABLE: CRSMAP

| KEY         | STREAM      |
|-------------|-------------|
| CAMA        | AMA         |
| LAMA        | AMA         |
| TOPS        | AMA         |
| <b>PCEM</b> | <b>PCEM</b> |

- cbm: configure PCEM billing stream using billmtc;confstrm;add command

example:

Stream Name [] {} : pcem  
Is this a Filter Stream [NO] {NO YES } : no  
Stream Record Format [] {SMDR BC CDR300 CDR250 PCEM PCES } : pcem  
File Format Type [] {LW } : lw  
Please specify the logical Volume [/cbmdata/00/billing/pcem] {} : /cbmdata/00/billing/pcem  
Do you want Files closed based on time [NO] {NO YES } : no  
Number of records per day [0] {} : 0  
Maximum Number of records per file [500000] {10000 - 500000} : 500000  
Maximum Number of bytes per file [20000000] {1000000 - 20000000} : 20000000

Stream Name -> PCEM  
Is this a Filter Stream -> NO  
Stream Record Format -> PCEM  
File Format Type -> LW  
Logical Volume Name -> /cbmdata/00/billing/pcem  
Do you want Files closed based on time -> NO  
Number of records per day -> 0  
Average record size -> 80  
Maximum Number of records per file -> 500000  
Maximum Number of bytes per file -> 20000000  
Commit ? [Save] {Save Edit Abort} : save  
Saving stream  
Configuration of Stream PCEM is now complete

- cbm: modify logical volume of already configured pcem stream (from billmtc;confstrm;change map level) while stream is still inactive

example:

Stream Name [] {} : pcem  
Stream Record Format [PCEM] {SMDR BC CDR300 CDR250 PCEM PCES } : pcem  
File Format Type [LW] {LW } : lw  
Please specify the logical Volume [/cbmdata/00/billing/pcem] {} :  
/cbmdata/00/billing/acct  
Do you want Files closed based on time [NO] {NO YES } : no  
Number of records per day [0] {} : 0  
Maximum Number of records per file [500000] {10000 - 500000} : 500000  
Maximum Number of bytes per file [20000000] {1000000 - 20000000} : 20000000

Stream Name -> PCEM  
Is this a Filter Stream -> NO  
Stream Record Format -> PCEM  
File Format Type -> LW  
Logical Volume Name -> /cbmdata/00/billing/acct  
Do you want Files closed based on time -> NO  
Number of records per day -> 0  
Average record size -> 80  
Maximum Number of records per file -> 500000  
Maximum Number of bytes per file -> 20000000  
Commit ? [Save] {Save Edit Abort} : save  
Saving stream  
Configuration of Stream PCEM is now complete

- cbm: query PCEM from billmtc;confstrm;list map level) while stream is inactive

example:

Stream Name [] {} : pcem

Displaying stream(s) PCEM  
Stream Name -> PCEM  
Stream Running status -> NO  
Is this a Filter Stream -> NO  
Stream Record Format -> PCEM  
File Format Type -> LW  
Logical Volume Name -> /cbmdata/00/billing/acct  
Do you want Files closed based on time -> NO  
Maximum Number of records per file -> 500000  
Maximum Number of bytes per file -> 20000000



- core: activate PCEM billing stream by issuing command  
“mapci;mtc;appl;sdbil;post pcam;sdbctrl pcam on”
- cbm: query PCEM from billmtc;confstrm;list map level) while stream is active

example:

Stream Name [] {} : pcam

Displaying stream(s) PCEM

Stream Name -> PCEM

Stream Running status -> YES

Is this a Filter Stream -> NO

Stream Record Format -> PCEM

File Format Type -> LW

Logical Volume Name -> /cbmdata/00/billing/pcam

Do you want Files closed based on time -> NO

Maximum Number of records per file -> 10000

Maximum Number of bytes per file -> 1000000

- cbm: modify ‘File closure criteria’ of already configured pcam stream  
(from billmtc;confstrm;change map level) while stream is active

example:

Stream Name [] {} : pcem  
 Do you want Files closed based on time [NO] {NO YES } : yes  
 File Closure time limit [10080] {5 - 10080} : 5  
 Number of records per day [0] {} : 0  
 Maximum Number of records per file [500000] {10000 - 500000} : 500000  
 Maximum Number of bytes per file [20000000] {1000000 - 20000000} : 20000000

Stream Name -> PCEM  
 Stream Running status -> YES  
 Is this a Filter Stream -> NO  
 Stream Record Format -> PCEM  
 File Format Type -> LW  
 Logical Volume Name -> /cbmdata/00/billing/pcem  
 Do you want Files closed based on time -> YES  
 File Closure time limit -> 5  
 Number of records per day -> 0  
 Average record size -> 80  
 Maximum Number of records per file -> 500000  
 Maximum Number of bytes per file -> 20000000

- core: display of pcam map level (mapci;mtc;appl;sdmbil;post pcam

|      |       |      |     |        |       |      |
|------|-------|------|-----|--------|-------|------|
| IOD  | PM    | CCS  | Lns | Trks   | Ext   | APPL |
| ITOC | 4LIU7 | 4 RS | .   | 132C.. | 1Crit | .    |
| *C*  | *C*   | *C*  |     | *C*    | *C*   |      |

|      |        |       |     |       |       |        |
|------|--------|-------|-----|-------|-------|--------|
| POST | OAMAP  | ATMFW | SDM | SPMCP | SWMTC | SDMBIL |
| PKT  | TOPSIP |       |     |       |       |        |

|           |        |      |       |      |       |      |   |
|-----------|--------|------|-------|------|-------|------|---|
| 0 Quit    | .      | .    | .     | .    | .     | .    | . |
| 2 Post_   |        |      |       |      |       |      |   |
| 3 Addvol_ |        |      |       |      |       |      |   |
| 4 Remvol_ | PCEM : | InSv | Pri:  | InSv | Rec:  | InSv |   |
| 5         |        |      | Bkup: | InSv | Comm: | InSv |   |
| 6 TST     |        |      |       |      |       |      |   |
| 7 Bsy     |        |      |       |      |       |      |   |
| 8 RTS     |        |      |       |      |       |      |   |
| 9 Conf_   |        |      |       |      |       |      |   |

```
10
11 DispAL
12
13 Status
14 Query   POST:
15
16
17 Audit
18
19 D
Time 19:59 >
```

- cbm: query command

example:

```
# query pcam
PCEM:
  PrimarySubStream:          InSv
  Number of Records in Open Files:    100
  ClosedNotSent Files Available:      59
  Records within the ClosedNotSent files: 7244059
  Date of Last File Sent:
    Tue Oct 19 11:25:16 2004
```

- cbm: amadump command

example:

```
# amadump pcam
```

Error: pcam record format is not supported.

- cbm: sendfile command

example:

```
# sendfile pcam
```

Sendfile does not support the LW format.

- cbm: listfile command

example:

```
U.20041019.111713.01071.PCEM.P
  Date: Tue Oct 19 11:17:13 2004 Recs: 122527 Size: 15622128 CNS
U.20041019.112213.01072.PCEM.P
  Date: Tue Oct 19 11:22:13 2004 Recs: 122801 Size: 15657016 CNS
U.20041019.112713.01073.PCEM.P
  Date: Tue Oct 19 11:27:13 2004 Recs: 122675 Size: 15640904
```

- cbm: closec command

example:

```
# closec pcam
```

No open files found

- cbm: attempt to create filter stream for already configured PCEM stream

Stream Name [] {} : emf

Is this a Filter Stream [NO] {NO YES } : YES

Associated Stream Name [] {} : pcam

Error: PCEM is a packet cable stream and cannot be specified as an associated stream.

## 2.12.2 Provisioning of PacketCable LI stream (PCES)

- core: create LI stream (PCES) by datafilling CRSFMT table

TABLE: CRSFMT

| KEY         | FORMAT         | DATADUMP | CDRSRCH       | ALARMS   | TIMERDMP | TIMERVAL |
|-------------|----------------|----------|---------------|----------|----------|----------|
| NIL         | NTFMT          | N        | NIL_FM        | N        | N        | 0        |
| <b>PCES</b> | <b>PCESFMT</b> | <b>N</b> | <b>NIL_FM</b> | <b>N</b> | <b>N</b> | <b>0</b> |

- core: Due to CRSFMT / SDMBILL table dependency, creation of PCES entry in CRSFMT creates following entry in table SDMBILL

TABLE: SDMBILL

| SDMBKEY     | SDMBACT    | SDMBSTAT   | EXPEDITE | VOLUMES     |              |
|-------------|------------|------------|----------|-------------|--------------|
| NIL         | OFF        | Off        | N        | \$          |              |
| AMA         | ON         | InSv       | N        | ( F02LAMA1) | (F17LAMA1)\$ |
| <b>PCES</b> | <b>OFF</b> | <b>Off</b> | <b>Y</b> | <b>\$</b>   |              |

- core: Note that backup volumes are not required for PCES stream. In fact, mapci;mtc;appl;sdbil;addvol pces f02lpces f17lpces command will alert user with 'backup volumes cannot be configured for PCES stream'.
- core: map calldata type PCES to LI stream PCES by datafilling CRSMAP table

TABLE: CRSMAP

| KEY         | STREAM      |
|-------------|-------------|
| CAMA        | AMA         |
| LAMA        | AMA         |
| TOPS        | AMA         |
| <b>PCES</b> | <b>PCES</b> |

- cbm: configure PCES billing stream using billmtc;confstrm;add command
- example:

Stream Name [] {} : pces

Is this a Filter Stream [NO] {NO YES } : no

Stream Record Format [] {SMDR BC CDR300 CDR250 PCEM PCES } : pces

Stream Name -> NPES

Is this a Filter Stream -> NO

Stream Record Format -> PCES

Commit ? [Save] {Save Edit Abort} : save

Saving stream

Configuration of Stream PCES is now complete

- cbm: query PCES from billmtc;confstrm;list map level when stream is inactive

example:

Stream Name [] {} : pces

Displaying stream(s) PCES

Stream Name -> PCES

Stream Running status -> NO

Is this a Filter Stream -> NO

Stream Record Format -> PCES

- core: activate PCES billing stream by issuing command  
“mapci;mtc;appl;sdbil;post pces;sdbctrl pces on”
- cbm: query PCES from billmtc;confstrm;list map level when stream is active

example:

Stream Name [] {} : pces

Displaying stream(s) PCES

Stream Name -> PCES

Stream Running status -> YES

Is this a Filter Stream -> NO

Stream Record Format -> PCES

- cbm: attempt to modify already configured pces stream (from billmtc;confstrm;change map level) while stream is active. Note that no changes are allowed.

example:

Stream Name [] {} : pces

Stream Name -> PCES

Stream Running status -> YES

Is this a Filter Stream -> NO

Stream Record Format -> PCES

Commit ? [Save] {Save Edit Abort} :

Commit ? [Save] {Save Edit Abort} :

Saving stream

Configuration of Stream PCES is now complete

- cbm: attempt to create filter stream for already configured PCES stream

Stream Name [] {} : esf

Is this a Filter Stream [NO] {NO YES } : YES

Associated Stream Name [] {} : pces

Error: PCES is a packet cable stream and cannot be specified as an associated stream.

- core: display of pcam map level (mapci;mtc;appl;sdmbil;post pces

```

          IOD      PM   CCS   Lns   Trks   Ext   APPL
          ITOC      4LIU7 4   RS    .    132C.. 1Crit  .
          *C*       *C*   *C*       *C*   *C*

POST      OAMAP ATMFW  SDM   SPMCP SWMTC SDMBIL
PKT TOPSIP

0 Quit      .    .    .    .    .    .    .
2 Post_
3 Addvol_
4 Remvol_   PCES :   InSv Pri:      InSv Rec:   Offl
5                               Bkup:   Offl  Comm:   InSv
6 TST
7 Bsy
8 RTS
9 Conf_
10
11 DispAL
12
13 Status
14 Query   POST:
15
16
17 Audit
18
D

```

Time 19:59 >

- cbm: amadump command

example:

```
# amadump pces
```

Error: pces record format is not supported.

- cbm: sendfile command

example:

```
# sendfile pces
```

No file formats supported for PCES stream.

- cbm: listfile command

example:

```
# listfile pces
```

Error: No file formats supported for PCES stream

- cbm: closec command

example:

```
# closec pces
```

No open files found

## 2.13 Recommended SBA configuration

This activity spans across switch core (3pc, xacore, brisc) and the CBM (Core Billing Manager).

Following is recommended:

- On CBM:
  - PacketCable Accounting stream (PCEM) must be configured for 6 hours of IAA (Integrated Accounting Application) downtime. This amounts to a logical volume requirement of 8Gbytes for SBA.
  - PCEM stream must be configured so that it grows to maximum possible size 20Mbytes. i.e. File closure based on max number of bytes.



## ***Product = CS 2000***

### **A00007465--Integrated Accounting Application** ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAC, DMS

#### **1.2 Description**

This document covers the IAA Event Messaging and Legal Intercept processing functionality supported in the SN08 time frame. This functionality adds a packet cable transport mechanism to the Core Billing Manager 850 (CBM850) which is packet cable compliant.

Accounting and Legal Intercept Event Messages are received by the IAA from the SBA and Gateway Controllers (GWCs). When received, the messages do not contain the RADIUS header necessary to send the event messages to the down stream RKS pair or DF. When sending to a RKS pair, ftp or secure ftp can be used as a primary transport protocol.

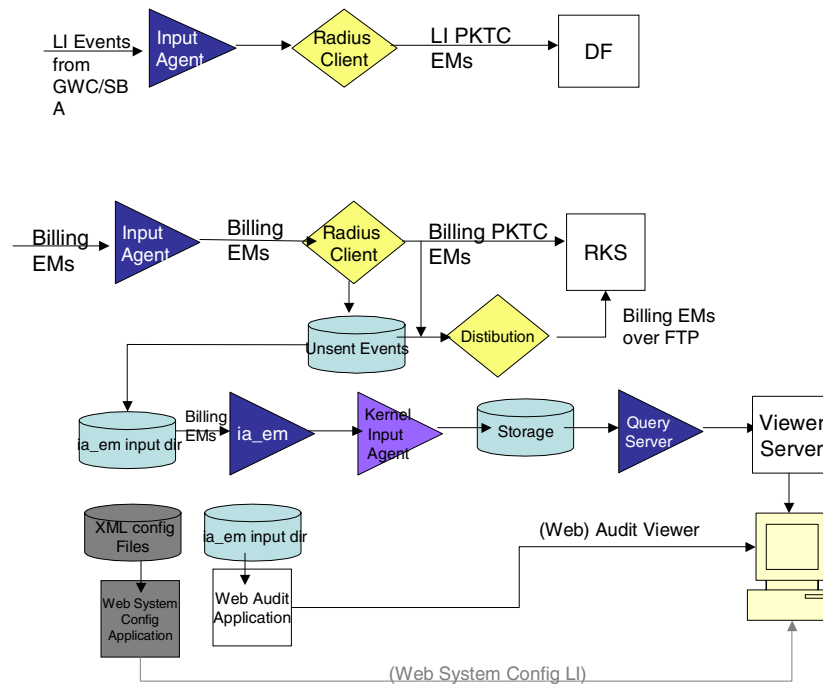
The accounting event messages will be reformatted to include a RADIUS header and a Sequence Number in the Event Message Header and then forwarded to a RKS pair. In the event that the accounting event messages cannot be delivered to the RKS, they are stored locally in the packet cable event message file format, and can be retrieved by the RKS or scheduled to be sent using the ftp or secure ftp protocol. In addition, the untransmittable accounting event messages are stored in the internal storage layer and made available to users via a record viewer web interface.

The legal intercept event messages are reformatted to include a RADIUS header and add a Sequence Number in the Event Message Header and then forwarded to a DF over a secure transport path. In the event the messages cannot be sent for any reason the events are dropped.

##### **1.2.1 System Behavior**

Accounting and Legal Intercept Event Messages will be received by the IAA application from the SBA (Supernode Billing Application) and GWCs (Gateway Controllers) via various interfaces.

There will be two SBA Input agents for processing primary and recovery files from the SBA. There will be a LI Collector module, which the SBA and different GWCs interface with, to transmit LI messages over UDP.



At the output side, there will be two Event Message Distribution Agents configured within the Accounting Server - one to handle LI messages and the other for Billing Accounting messages. These two instances will be identified by configuration as to what type of Event Messages each one handles.

The Billing/Accounting EMDA will send RADIUS messages to Record Keeping Server (RKS) pairs and the LI EMDA will send messages to one or more Delivery Function (DF) Servers.

The routing to various destinations will be done on the basis of the Channel ID field present in the LI and Billing Messages obtained from the SBA and GWCs. Each Channel ID will have corresponding to it (in a lookup table), a DF or RKS Pair to which the data needs to be sent to.

The accounting event messages will be reformatted to include a RADIUS header and add a Sequence Number in the Event Message Header and then forwarded to a RKS pair. In the event that the accounting event messages cannot be delivered to the RKS, they are stored locally and can be retrieved by the RKS or scheduled to be sent using the ftp or secure ftp protocol. In addition, the untransmittable accounting event messages are stored in the

internal storage layer and made available to users via a record viewer web interface.

The legal intercept event messages are reformatted to include a RADIUS header and add a Sequence Number in the Event Message Header and then forwarded to a DF over a secure transport path. In the event the messages cannot be sent for any reason the events are dropped.

A FTP agent will take care of sending the data over FTP downstream to the RKS, if configured to do so.

A Web-based User Interface (and Command line tool) will allow configuration and ability to view untransmitted event messages.

### 1.2.2 Configuration

The configuration information used by the IAA is contained in various XML files. These files are found in the directory **/iaa/<xx>/data/config**. The items that can be configured by the user, using the web interface or command line tool (iaa\_config\_cli) can be found in the configuration section.

The configuration files that control the operation of the IAA modules can be found in **/iaa/<xx>/data/<module name>/<module name>.config**. This information is updated during the application installation and should not be modified by the end user. Below is an example of the xml configuration file for the emda module:

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE config SYSTEM "config.dtd">

<!--
#
# FILE NAME
#   emda.config
#
# FILE CREATION
#   19 July'2004 By Ashwini Ravindra.
#
# FILE REVISION
#   $Id: emda_li.config,v 1.1.2.1 2004/08/06 10:21:36 vjohn Exp $
#
# FILE HISTORY
#   $Log: emda_li.config,v $
#   Revision 1.1.2.1 2004/08/06 10:21:36 vjohn
#   Initial checkin for EMDA
#
#
-->
<!--
```

```
<!-- -->
<!-- Module      Event Message Distribution Agent      -->
<!-- -->
<!--      Start of configuration settings      -->

<config>

  <import file="common.xml">
    <section name="processTable">
      <param name="processID" value="302"/>
      <param name="processType" value="emda"/>
      <param name="processMgmtPort" value="6071"/>
    </section>

    <section name="urf"/>

    <section name="clientCom">
      <param name="clientId" value="401"/>
      <param name="clientUnixSocketPath" value="/tmp/kernel_1.sck"/>
      <param name="serverPort" value="5000"/>
    </section>

    <section name="serverCom">
      <param name="serverPort" value="7001"/>
      <param name="serverUnixSocketFile" value="/tmp/emda_li.sck"/>
    </section>

    <section name="miscSettings"/>

    <section name="log">
      <param name="logFileName" value="emda_li"/>
    </section>

    <section name="progressStorage"/>
    <section name="lightStorage"/>
    <section name="shmBuffer">
      <param name="shmPath" value="/shmpath/li_emda"/>
    </section>
    <section name="inputurf"/>
    <section name="io">
      <param name="outputMechanism" value="0"/>
      <param name="inputMechanism" value="0"/>
    </section>
  </import>

  <section name="EMDAMisc">
    <dir name="tablepath" value="$(RECO_HOME)/>
    <bool name="useReferenceData" value="TRUE"/>
    <int name="numOfSeconds" value="10"/>
    <int name="DestinationType" value="0" />
    <int name="DistributionCapFactor" value="2"/>
    <int name="KeepVSAHeader" value="0"/>
  </section>
</config>
```

```

<int name="SenderThreadSleepTime" value="1000"/>
<int name="MonitorThreadSleepTime" value="1000"/>
<int name="ReceiverThreadSleepTime" value="1000"/>
<int name="FileWriterThreadSleepTime" value="1000"/>
<int name="ShmFlushInterval" value="100"/>
</section>

<import file="global_parameters_list.config">
  <section name="GlobalParameters"/>
  <table name="GlobalParametersTable"/>
</import>
<import file="destination_streams_list.config">
  <section name="DestinationStreams"/>
  <table name="DestinationStreamsTable"/>
</import>

<table name="refDataSectionNames">
  <string column="refDataSectionName"/>
  <string column="tableSectionName"/>
  <row>
    <cell column="refDataSectionName" value="GlobalParameters"/>
    <cell column="tableSectionName" value="GlobalParameters"/>
  </row>
  <row>
    <cell column="refDataSectionName" value="DestinationStreams"/>
    <cell column="tableSectionName" value="DestinationStreams"/>
  </row>
</table>
</config>

```

### 1.2.3 Starting the IAA

The IAA modules are started and controlled by the SDM Application Manager (SAM). Upon startup the input agents bind to ports as defined in /etc/services to listen for LI event messages as well as messages from the SBA to indicate that data was written to a file.

### 1.2.4 Stopping the IAA

The IAA modules are stopped by the SDM Application Manager (SAM).

### 1.2.5 File Management

Temporary files used by the IAA modules are removed after they are no longer needed. Files created by the EMDA (if configured to send to the RKS via ftp or sftp or if they cannot send events to the downstream RKS in realtime) are moved to the **/iaa/<nn>/secondary** directory by the fdsend program. If the filesystem is full the oldest secondary (already transmitted) file or files will be removed to make room for the new file. It is anticipated that this filesystem will remain at 80 to 100 percent capacity.

The event messages that are not sent downstream are also stored in the IAA storage layer and made available to the end user for viewing via the web. This data is stored in the directory **/iaa/<nn>/kdb**. These files are removed by the utility 'remove\_aged\_file'. When invoked it will take as parameters: the number of days old as a reference and the list of directories to search for old files.

### 1.2.6 Filesystems and Directories

Upon installation of the IAA the following filesystems and directories will be created to hold executables, libraries and data used and created by the application.

FileSystems:

```
/cbmdata/<slices>/iaa/data  
/cbmdata/<slices>/iaa/ftpout  
/cbmdata/<slices>/iaa/kdb  
/cbmdata/<slices>/iaa/config
```

Directories:

```
/opt/nortel/cbm/<xx>/iaa  
/opt/nortel/cbm/<xx>/iaa/bin  
/opt/nortel/cbm/<xx>/iaa/slib  
/opt/nortel/cbm/<xx>/iaa/webapps
```

## 1.3 Hardware Requirements or Dependencies

The IAA has the following requirements:

- SUN Netra 240
- 2GB of RAM dedicated for the IAA modules, for a system configuration of 4GB.

## 1.4 Software Requirements or Dependencies

SSPFS 3rd party Software Suite Version 08 with the following version dependencies:

- Apache Web Server 2.0.47 or above
- JRE 1.4.2\_04 or above
- Apache Tomcat 4.1.24 or higher
- SBA
- jdom 1.0 beta 7 or higher
- dom4j 1.4
- saxon 6.4.3

## 1.5 Limitations and restrictions

Due to disk storage requirements only records not sent to the downstream RKS over the RADIUS protocol, will be viewable via the IAA record viewer

## 1.6 .Interactions

- Syslog daemon Server (Designer logs)
- Customer Logs
- State Changes

## 1.7 Applicable customer facing sections

### Fault Management

Logs ☒

Alarms ☒

### Configuration

Data Schema ☐

User Interface ☒

Element Management ☐

Security ☐

Service Order ☐

Office Parameters ☐

Accounting (includes AMA billing) ☐

Performance (includes operational measurements) ☒

## 1.8 Glossary

Table 3

| Term  | Description                       |
|-------|-----------------------------------|
| DF    | Delivery Function Server          |
| GWC   | Gateway Controllers               |
| IAA   | Integrated Accounting Application |
| LI    | Legal Intercept                   |
| PC EM | Packet Cable Event Message        |
| RKS   | Record Keeping Server             |

**Table 3**

| Term | Description                   |
|------|-------------------------------|
| SBA  | Supernode Billing Application |
| XML  | eXtensible Markup Language    |

## 2: Fault Management for A00007465

### 2.1 Fault management strategy

Faults and alarms generated by the IAA modules are sent to Customer logs using the API provided and defined in the Log Reporting Rules and Guidelines document. (IEMPG, AF01). The IAA modules will use Log Number SDM799 and SDM399 when generating messages viewable by the customer. Designer information is written to the designer logs using the syslog mechanism directly.

### 2.2 Fault management tools and utilities

As a result of using the API provided by Nortel, the customer logs, state changes and designer logs can be managed using the existing tools Nortel has in place.

### 2.3 Logs

The following new alarms and log ID are being added as part of the IAA feature

.

**Table 1 IAA logs**

| LOG NAME | LOG NUMBER | NEW/MOD<br>DELETED | SYSTEM<br>(SOS/UNIX) |
|----------|------------|--------------------|----------------------|
| IAA      | 341        | NEW                | UNIX                 |
| IAA      | 342        | NEW                | UNIX                 |
| IAA      | 343        | NEW                | UNIX                 |
| IAA      | 344        | NEW                | UNIX                 |
| IAA      | 345        | NEW                | UNIX                 |
| IAA      | 346        | NEW                | UNIX                 |
| IAA      | 347        | NEW                | UNIX                 |
| IAA      | 641        | NEW                | UNIX                 |
| IAA      | 646        | NEW                | UNIX                 |
| IAA      | 701        | NEW                | UNIX                 |



### 2.3.1 Log Report - IAA341

Example:

CA108CD \*\*\* IAA341 APR08 14:50:47 3800 TBL IAA Module Initialization Failure

Module: <Module Name>

Reason: <Reason>

#### 2.3.1.1 Overview

The IAA341 log is generated whenever an IAA module fails to initialize. The reason text field may contain one of the following strings:

- **“Error Loading URF Specification File”**

**Cause:** This log message is generated when the modules URF specification file is corrupted or missing.

**Action:** Verify the URF specification file for the module is in the correct location and is not corrupted. Otherwise contact next level of support.

- **“Error Initializing spathreaddata object”**

**Cause:** This log message is generated when the system resources are not available.

**Action:** Determine the cause of unavailable system resources and restart the application. Otherwise contact the next level of support.

- **“License check failed”**

**Cause:** This log message is generated if the software license, needed to run the IAA application, is missing.

**Action:** Verify the license file is in the correct directory and restart the application. Otherwise contact the next level of support.

- **“Cannot create socket, Port # %u”**

**Cause:** This log message is generated if the system resources are unavailable, or if another process is attached to the port number displayed in the alarm.

**Action:** Determine if another application is connected to the port number in question. Determine the cause of unavailable system resources and restart the application. Otherwise contact the next level of support.

- **“Shared Memory Initialization Failed”**

**Cause:** This log message is generated if the system resources are unavailable.

**Action:** Determine the cause of the unavailable system resources and restart the application. Otherwise contact the next level of support.

- **“Failed to flush shared memory queue to disk”**

**Cause:** This log message is generated, if the file system the module is attempting to write its shared memory queue to is full or the permissions are not correct.

**Action:** Verify that the files system has the correct permissions set and that there is space available on the filesystem. Otherwise contact the next level of support.

- **“Bad Parameters Passed at Startup”**

**Cause:** An invalid parameter was passed to the IAA module.

**Action:** Verify the startup script is passing correct parameters, and restart the application. Otherwise contact the next level of support.

### 2.3.2 Log Report - IAA342

Example:

```
CA108CD *** IAA342 APR08 14:50:47 3800 TBL IAA Module Interprocess Communication Failure
Module: <Module Name>
Reason: <Reason>
```

#### 2.3.2.1 Overview

The IAA342 log is generated whenever an IAA module cannot communicate with other IAA modules. The reason text field may contain one of the following strings:

- **“Error Communicating to EMDA”**

**Cause:** This log message is generated when a module cannot communicate with the EMDA module.

**Action:** Verify that the EMDA modules is operational and listening to the correct port. Otherwise contact the next level of support.

### 2.3.3 Log Report - IAA343

Example:

```
CA108CD *** IAA343 APR08 14:50:47 3800 TBL IAA PCEM Processing Error
Module: <Module Name>
FileName: <Name of Bad file if Available>
Reason: <Reason>
```

#### 2.3.3.1 Overview

The IAA343 log is generated when a PCEM processing error occurs. The reason text field may contain one of the following strings:

- **“Error Reading Input File”**

**Cause:** This log message is generated if there is a problem reading an input data file.

**Action:** Verify that the correct permissions are set on the file displayed in the alarm.

- **“Error Renaming or Accessing file”**

**Cause:** This log message is generated if the IAA module cannot access the specified file or rename it.

**Action:** Verify the correct permissions of the file and filesystem displayed in the log messages. Otherwise contact the next level of support.

- **“Error generating checksum”**

**Cause:** IAA module was unable to create the correct checksum.

**Action:** Verify that the input file is not corrupted. Otherwise contact the next level of support.

- **“Error writing to File”**

- **Cause:** This log message is generated if the IAA module cannot write to its output file.

- **Action:** Verify that the permissions on the file and filesystem are correct. Verify there is space available on the filesystem. Otherwise contact the next level of support.

- **“Failed to receive UDP messages”**

**Cause:** This log message is generated if the IAA application cannot receive UDP messages.

**Action:** Determine the cause of the unavailable system resources and restart the application. Otherwise contact the next level of support.

- **“Failed to flush shared memory queue to disk”**

**Cause:** This log message is generated if the file system, the module is attempting to write its shared memory queue to, is full or the permissions are not correct.

**Action:** Verify that the file system has the correct permissions set and that there is space available on the filesystem. Otherwise contact the next level of support.

## 2.3.4 Log Report - IAA344

Example:

CA108CD \*\*\* IAA344 APR08 14:50:47 3800 TBL IAA PCEM Audit Error

Module: <Module Name>

AuditName: <Name of Audit>

Reason: <Reason>

### 2.3.4.1 Overview

The IAA344 log is generated when an IAA module cannot create an audit entry. The reason text field may contain one of the following strings:

- **“Error Creating Audit”**

**Cause:** This log message is generated if there is a problem creating an audit entry.

**Action:** Verify that the correct permissions are set in the audit directory and that there is space on that filesystem.

### 2.3.5 Log Report - IAA345

Example:

```
CA108CD *** IAA345 APR08 14:50:47 3800 TBL IAA Module Configuration Error
Module: <Module Name>
Parameter: <Name of Parameter>
Reason: <Reason>
```

#### 2.3.5.1 Overview

The IAA345 log is generated when an IAA module detects a configuration problem. The reason text field may contain one of the following strings.

- **“Required Configuration parameter not found”**

**Cause:** This log message is generated if a required configuration value is not defined.

**Action:** Datafill the required configuration parameter.

- **“Received messages for Unknown Channel ID <%d>”**

**Cause:** This log message is generated if the IAA module receives a PCEM or PCES message for an unconfigured Channel ID.

**Action:** Datafill the Channel ID for the appropriate RKS pair or DF.

### 2.3.6 Log Report - IAA346

Example:

```
CA108CD *** IAA346 APR08 14:50:47 3800 TBL IAA Downstream Communication Error
Module: <Module Name>
Destination ID: <Name of Bad file if Available>
Reason: <Reason>
```

#### 2.3.6.1 Overview

The IAA346 log is generated when the IAA cannot communicate to the downstream RKS pair or DF. The reason text field may contain one of the following strings.

- **“Destination is down - Writing to file”**

**Cause:** This log message is generated if the downstream RKS pair is unreachable and the message is save to a file for transmission at a later time.

**Action:** The craftsperson should ascertain what was the cause of the problem and correct the problem. Once the connection to the RKS pair is re-established the IAA application will return to InSrv.

- **“DF: Destination is Down - Message dropped for ChannelID <%d>, Dropped Message Count <%d>”**

**Cause:** This log message is generated if the downstream DF is unreachable.

**Action:** The craftsperson should ascertain what was the cause of the problem and correct the problem. Once the connection to the DF is re-established the IAA application will return to InSrv.

- **“Cannot Connect to Primary RKS”**

**Cause:** The IAA cannot connect to the RKS when trying to ftp a file.

**Action:** The craftsperson should ascertain what was the cause of the problem and correct the problem. Once the connection to the RKS pair is re-established the IAA application will return to InSrv.

- **“Cannot place file on RKS”**

**Cause:** This log message is generated if the IAA cannot place the file on the RKS after the connection is made.

**Action:** The craftsperson should ascertain what was the cause of the problem and correct the problem. Once the connection to the RKS pair is re-established the IAA application will return to InSrv.

### 2.3.7 Log Report - IAA347

Example:

```
CA108CD *** IAA347 APR08 14:50:47 3800 TBL IAA Filesystem Management Error
Module: <Module Name>
Directory: <Directory Name>
Reason: <Reason>
```

#### 2.3.7.1 Overview

The IAA347 log is generated when an IAA module detects a problem when trying to manage its filesystem storage. The reason text field may contain one of the following strings.

- **“Unable to move files to Secondary Directory”**

**Cause:** This log message is generated if the IAA module fdscnd cannot move a file it successfully transferred to a RKS to a secondary directory.

**Action:** Verify permissions and space on filesystem.

### 2.3.8 Log Report - IAA641

Example:

```
CA108CD *** IAA641 APR08 14:50:47 3800 INFO IAA Module Startup
Module: <Module Name>
Reason: <Reason>
```

### 2.3.8.1 Overview

The IAA641 log is generated when an IAA module goes into service.

- **“IAA Module has been restarted”**

**Cause:** This log message is generated when an IAA module is successfully started.

**Action:** No Action is needed as this is purely for informational purposes.

### 2.3.9 Log Report - IAA646

Example:

CA108CD \*\*\* IAA646 APR08 14:50:47 3800 INFO IAA Communication Restored

Module: <Module Name>

Reason: <Reason>

#### 2.3.9.1 Overview

The IAA646 log is generated when Communications between the IAA and the downstream RKS pair or DF has been restored.

- **“Communications has been re-established”**

**Cause:** This log message is generated when Communications between the IAA and the downstream RKS pair or DF has been restored.

**Action:** No Action is needed as this is purely for informational purposes.

### 2.3.10 Field Description

Field Name: Module

Field optionally: mandatory

Type: Alphanumeric

Size: Variable

Value(s): Variable

Descriptions: Identifies the module generating the log.

NTP table reference: Not applicable.

Field Name: Destination ID

Field optionally: mandatory

Type: Alphanumeric

Size: Variable

Value(s): Variable

Descriptions: Identifies the Destination the IAA is attempting to communicate to.

NTP table reference: Not applicable.

Field Name: Parameter

Field optionally: mandatory

Type: Alphanumeric

Size: Variable

Value(s): Variable

Descriptions: Identifies the Parameter that is not configured correctly.  
NTP table reference: Not applicable.

Field Name: AuditName  
Field optionally: mandatory  
Type: Alphanumeric  
Size: Variable  
Value(s): Variable

Descriptions: Identifies the audit that the module is attempting to create.  
NTP table reference: Not applicable.

Field Name: FileName  
Field optionally: mandatory  
Type: Alphanumeric  
Size: Variable  
Value(s): Variable  
Descriptions: Identifies the file the IAA module is attempting to operate on.  
NTP table reference: Not applicable.

Field Name: Reason  
Field optionally: mandatory  
Type: Alphanumeric  
Size: Variable  
Value(s): Variable  
Descriptions: Provides an explanation of why the log was generated.  
NTP table reference: Not applicable.

## 2.4 Alarms

### 2.4.1 Alarm - IAA701

Example:

CA108CD \*\*\* IAA701 APR08 14:50:47 3800 TBL IAA Data Corruption

Module: <Module Name>

Reason: <Reason>

#### 2.4.1.1 Overview

The IAA701 log is generated when the data being process by the IAA is corrupted.

- **“Could not get EM Header in Message. Got %u at byte no %u. Channel ID= %u”**

**Cause:** This log message is generated when the EM messages being processed by the IAA is corrupted.

**Action:** Contact the next level of support.

### 2.4.2 Field Description

Field Name: Module

Field optionally: mandatory

Type: Alphanumeric

Size: Variable

Value(s): Variable

Descriptions: Identifies the module generating the log.

NTP table reference: Not applicable.

## 2.5 Related documentation

# 3: Configuration for A00007465

## 3.1 Hardware and Software Requirements

The IAA has the following hardware requirements:

- SUN Netra 240
- 2GB of RAM dedicated for the IAA modules, for a system configuration of 4GB.

The IAA has the following software requirements:

- SSPFS 3rd party Software Suite Version 08 with the following version dependencies:
- Apache Web Server 2.0.47 or above
- JRE 1.4.2\_04 or above
- Apache Tomcat 4.1.24 or higher
- SBA
- jdom 1.0 beta 7 or higher
- dom4j 1.4
- saxon 6.4.3

## 3.2 Initial Configuration

Following the installation of the IAA modules the following items must be configured:

- RKS pair
- DF
- Distribution Schedule
- Global System parameters



### 3.3 Upgrade Considerations

This is the first installation of this application, there are no upgrade considerations for this release. The software is designed and packaged such that two or more versions can reside on the same platform, this allows the system to be upgraded without interruption of service. Tools will be provided to migrate the configuration of previous release to the latest release, beginning with SN09.

#### 3.3.1 Patching

Fixes required to an existing IAA application will be delivered in the form of a solaris patch. The patch will follow the conventions set forth in the CBM Designer's Guide.

#### 3.3.2 Dump and Restore (CM)

For SN08 the ability to backup the current configuration to a removable storage media is supported. This configuration information can be used to populate the configuration of a second instance on the same system or on a second system.

Beginning with SN09 a migration tool will be supplied to take an existing configuration and use the information to populate the configuration of the new version. Once the new release is loaded on the system the command "migrate\_configuration -p<prev\_rel> -c<current\_rel>" is used to move the previous release's configuration information to the new release's configuration.

#### 3.3.3 Downgrade impact

Providing that the old software has not been removed, the old software only needs to be re-registered with SAM, by issuing the \$BASEDIR/bin/appctrl -i command.

### 3.4 Element Management

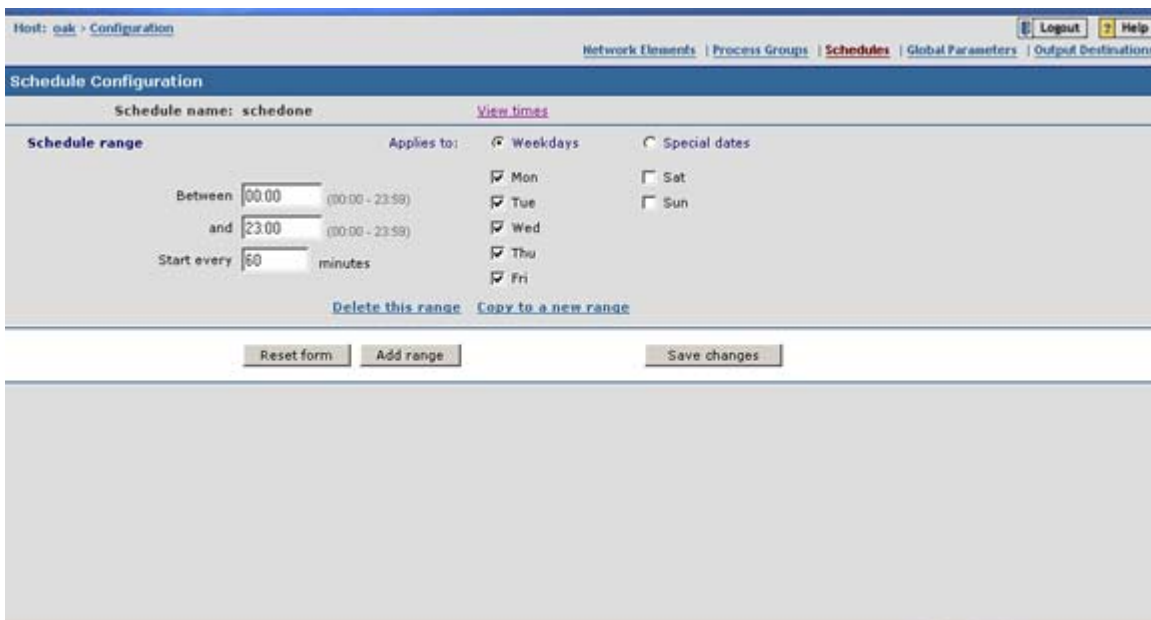
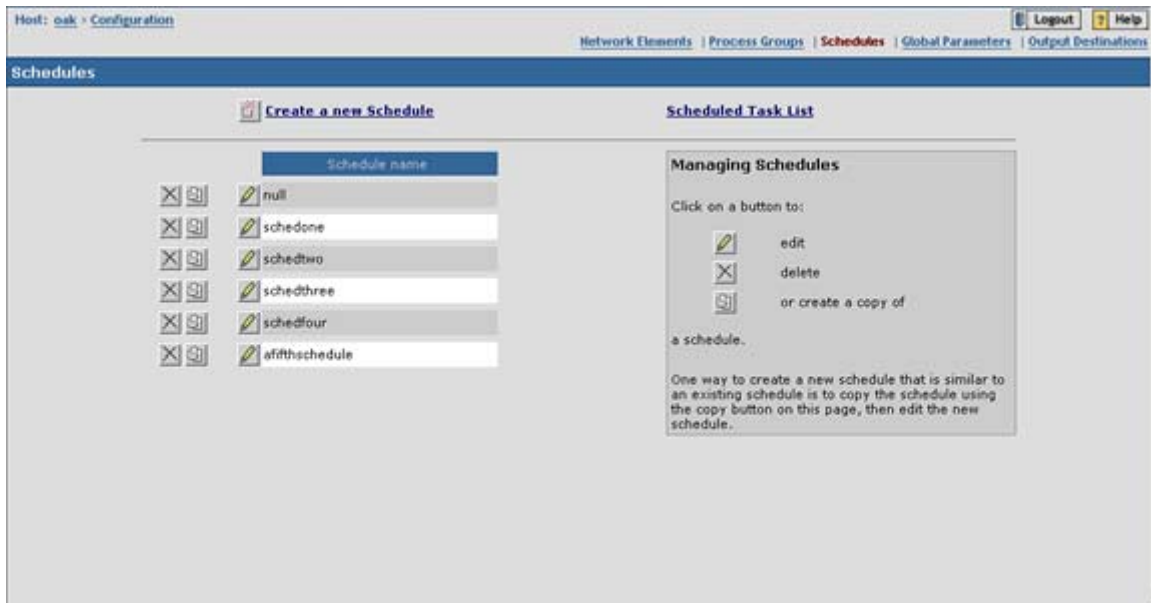
Configuration changes for the IAA modules can be done via a Web interface or via a command line program. On-line help is available from each web page, by selecting the help button at the top of each page.

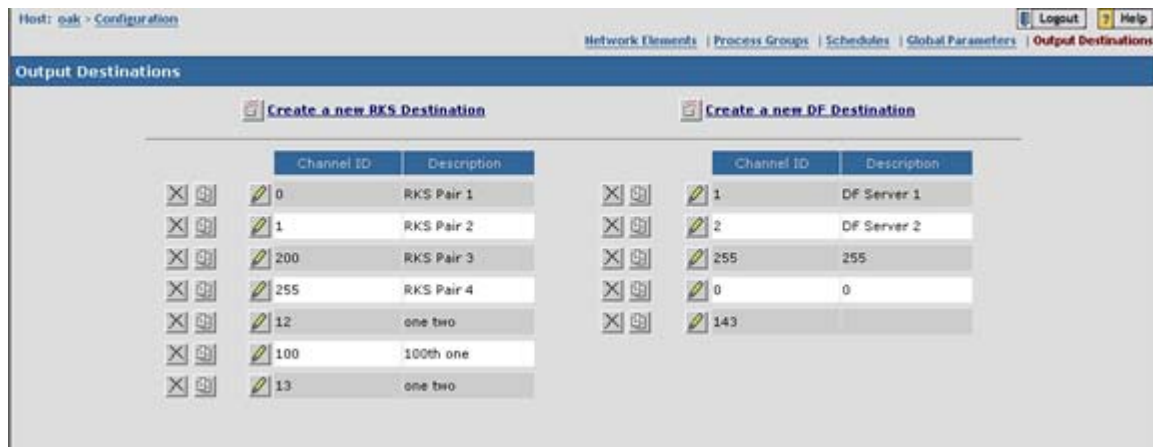
#### 3.4.1 New/modified GUIs

Table 1 New or modified GUIs

| GUI name                 | NEW, CHANGED, or DELETED |
|--------------------------|--------------------------|
| RKS Output Destination   | NEW                      |
| DF Output Destination    | NEW                      |
| Global System Parameters | NEW                      |

### 3.4.2 GUI information





### 3.4.2.1 GUI name: RKSOD

RKS Output Destination

#### 3.4.2.1.1 Functional description

This GUI is used to configure the downstream RKS pairs to which the EMDA sends event messages as well as the protocol to use.

Example:

### 3.4.2.1.2 GUI usage and implications

The Schedule GUI must be datafilled prior to datafill of this GUI.

### 3.4.2.1.3 GUI size

Table 2 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| RKSOD                | 1                 | 1                 | N/A                   |

### 3.4.2.1.4 GUI fields

On-line help is available on this web page which defines the meanings of each field contained on the page.

Table 3 Output Destination Streams

| Parameter  | Description/<br>List of values | Data Format | Validation | Max Value | Max Field Size | Default Value |
|------------|--------------------------------|-------------|------------|-----------|----------------|---------------|
| Channel Id | 1 byte field                   | integer     | required   | 255       |                |               |

**Table 3 Output Destination Streams**

| <b>Parameter</b>                          | <b>Description/<br/>List of<br/>values</b> | <b>Data Format</b>              | <b>Validation</b>              | <b>Max<br/>Value</b> | <b>Max<br/>Field<br/>Size</b> | <b>Default<br/>Value</b> |
|-------------------------------------------|--------------------------------------------|---------------------------------|--------------------------------|----------------------|-------------------------------|--------------------------|
| Destination Type                          | 0 - DF<br>1 - RKS                          | integer                         | required                       |                      | 1                             |                          |
| Description                               | Free Form<br>Text                          | alphanumeric                    | optional                       |                      | 32                            |                          |
| DF Collector / Primary<br>RKS IP          | IP address                                 | alphanumeric                    | required                       |                      | 15                            |                          |
| DF Collector / Primary<br>RKS Radius Port |                                            | positive<br>integer             | required                       | 65535                |                               |                          |
| Primary RKS FTP Port                      |                                            | positive<br>integer             | required if<br>RKS (note<br>1) | 65535                |                               | 21                       |
| Primary RKS FTP<br>Username               |                                            | alphanumeric                    | required if<br>RKS (note<br>1) |                      | 32                            |                          |
| Primary RKS FTP<br>Password               |                                            | alphanumeric<br>[not displayed] | required if<br>RKS (note<br>1) |                      | 32                            |                          |
| Primary RKS Destination<br>Directory      |                                            | alphanumeric                    | Optional<br>(Note 1)           |                      | 512                           |                          |
| Secondary RKS IP                          | IP address                                 |                                 | required if<br>RKS             |                      | 15                            |                          |
| Secondary RKS Radius<br>Port              |                                            | positive<br>integer             | required if<br>RKS             | 65535                |                               |                          |
| Secondary RKS FTP Port                    |                                            | positive<br>integer             | optional<br>(note 1)           | 65535                |                               | 21                       |
| Secondary RKS FTP<br>Username             |                                            | alphanumeric                    | optional<br>(note 1)           |                      | 32                            |                          |
| Secondary RKS FTP<br>Password             |                                            | alphanumeric<br>[not displayed] | optional<br>(note 1)           |                      | 32                            |                          |
| Secondary RKS<br>Destination Directory    |                                            | alphanumeric                    | Optional<br>(note 1)           |                      | 512                           |                          |
| Retry Limit                               | Number of<br>retries                       | integer                         | required                       | 9                    |                               | 3                        |
| Retry Interval                            | in seconds                                 | positive<br>integer             | required                       | 9                    |                               | 1                        |

**Table 3 Output Destination Streams**

| <b>Parameter</b>       | <b>Description/<br/>List of<br/>values</b> | <b>Data Format</b>   | <b>Validation</b>    | <b>Max<br/>Value</b> | <b>Max<br/>Field<br/>Size</b> | <b>Default<br/>Value</b> |
|------------------------|--------------------------------------------|----------------------|----------------------|----------------------|-------------------------------|--------------------------|
| Batch Interval         | in seconds                                 | positive integer     | required             | 30                   |                               | 2                        |
| Messages in Batch      | Number of messages                         | positive integer > 1 | required             | 10                   |                               | 5                        |
| Shared Secret          |                                            | alphanumeric         | required             |                      | 32                            | 00000000<br>00000000     |
| Security Protocol      | 0 - None<br>1 - IPSec                      | Integer              | required             | 1                    |                               | 1 - IPSec                |
| FTP Inbound / Outbound | 0 - Outbound (Push)<br>1 - Inbound (Pull)  | integer              | required             | 1                    |                               |                          |
| FTP Schedule           | List of Configured Schedules               | alphanumeric         | only if FTP Outbound |                      |                               |                          |
| FTP Mode               | 0 - FTP<br>1 - Secure FTP                  | integer              | only if FTP Outbound | 1                    |                               | sFTP                     |
| Max. File Length       | size of file in bytes, kB, MB              | positive integer     | required             |                      | 3                             | 2 MB                     |
| Max. Open Time         | time in minutes                            | positive integer     | required             | 120                  |                               | 60                       |
| File Priority          | 1, 2, 3, 4                                 | positive integer     | required             | 4                    |                               | 1 - lowest               |

Notes

(1) Only if sending mode is set to FTP

**3.4.2.2 GUI name: DFOD**

DF Output Destination

**3.4.2.2.1 Functional description**

This GUI is used to configure the downstream DF which the EMDA sends LI event messages as well as the protocol to use.

Example:

Host: oak > Configuration Logout Help

Network Elements | Process Groups | Schedules | Global Parameters | **Output Destinations**

### DF Output Destination Configuration

Channel ID: 2 Destination Type: DF

Description: DF Server 2

IP Address: 212.12.34.169 RADIUS Port: 21

Retry Limit: 3 Retry Interval: 3

Shared Secret: 0000000000000000

Reset form Save changes

#### 3.4.2.2.2 GUI usage and implications

No other datafill is required prior to datafill of this GUI.

#### 3.4.2.2.3 GUI size

**Table 4 New or modified GUIs**

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| DFOD                 | 1                 | 1                 | N/A                   |

#### 3.4.2.2.4 GUI fields

On-line help is available on this web page which defines the meanings of each field contained on the page.

**Table 5 Output Destination Streams**

| Parameter                              | Description / List of values | Data Format      | Validation | Max Value | Max Field Size | Default Value |
|----------------------------------------|------------------------------|------------------|------------|-----------|----------------|---------------|
| Channel Id                             | 1 byte field                 | integer          | required   |           | 255            |               |
| Channel Type                           | 0 - DF<br>1 - RKS            | integer          | required   |           | 3              |               |
| Description                            | Free Form Text               | alphanumeric     | optional   |           | 32             |               |
| DF Collector / Primary RKS IP          | IP address                   | alphanumeric     | required   |           | 16             |               |
| DF Collector / Primary RKS Radius Port |                              | positive integer | required   | 65535     |                | 21            |
| Retry Limit                            | Number of retries            | integer          | required   | 9         |                | 3             |
| Retry Interval                         | in seconds                   | positive integer | required   | 9         |                | 1             |

**Table 5 Output Destination Streams**

| Parameter     | Description /<br>List of values | Data Format  | Validation | Max<br>Value | Max<br>Field<br>Size | Default<br>Value     |
|---------------|---------------------------------|--------------|------------|--------------|----------------------|----------------------|
| Shared Secret |                                 | alphanumeric | required   |              | 32                   | 00000000<br>00000000 |

**3.4.2.3 GUI name: GSP**

Global System Parameters.

**3.4.2.3.1 Functional description**

This GUI is used to configure the NE providing the Accounting messages.

Example:

The screenshot shows a web-based configuration interface titled 'Global Parameters'. It contains several input fields and controls:
 

- Packet Cable Element ID:** A text box containing 'asasa'.
- Format Version:** A dropdown menu set to 'PacketCable Multimedia'.
- Time Zone Daylight Savings Time:** An unchecked checkbox.
- Time Zone UTC Offset (h:mm:ss):** A dropdown menu.
- Accounting Message Sending Mode:** A dropdown menu set to 'FTP'.
- Event Message File Path:** A text box containing '/cbndata/00/meddata/outgoing/ftpdata/sending'.
- Buttons:** 'Reset form' and 'Save changes' buttons are located at the bottom of the form.

**3.4.2.3.2 GUI usage and implications**

No other datafill is required prior to datafill of this GUI.

**3.4.2.3.3 GUI size****Table 6 New or modified GUIs**

| Abbreviated<br>GUI name | Minimum<br>instances | Maximum<br>instances | Information on memory |
|-------------------------|----------------------|----------------------|-----------------------|
| GSP                     | 1                    | 1                    | N/A                   |

**3.4.2.3.4 GUI fields**



On-line help is available on this web page which defines the meanings of each field contained on the page.

**Table 7 Packet Cable Global Parameters**

| <b>Parameter</b>                           | <b>Description / List of Values</b>                       | <b>Data Format</b>                       | <b>Validation Description</b> | <b>Max. Value</b> | <b>Max Field Size</b> | <b>Default Value</b> |
|--------------------------------------------|-----------------------------------------------------------|------------------------------------------|-------------------------------|-------------------|-----------------------|----------------------|
| Element ID                                 | 5 digit unique Network Element ID                         | integer                                  | required                      | 99999             |                       |                      |
| Format Version                             | 1 - PktCbl 1.0<br>2 - PktCbl 1.1<br>3 - PktCbl Multimedia | positive integer                         | required                      | 3                 |                       | 1                    |
| TimeZone DST                               | 0 - Standard<br>1 - DST                                   | integer                                  | required                      | 1                 |                       |                      |
| TimeZone UTC Offset                        | +/- HHMMSS                                                | alphanumeric                             | required                      |                   | 10                    |                      |
| Sending Mode<br>for Accounting<br>Messages | 0 - RADIUS Realtime<br>1 - RADIUS Batch<br>2 - FTP        | integer                                  | required                      |                   | 1                     | 0                    |
| EM File Path                               | Unix File Path                                            | Printable<br>ASCII<br>Characters<br>Only | required                      |                   | 256                   | 0                    |

## 3.5 User interface changes

### 3.5.1 Command: `iaa_config_cli`

#### 3.5.1.1 Command type: NON-MENU

#### 3.5.1.2 Command target: CBM

#### 3.5.1.3 Command availability: RES

#### 3.5.1.4 Command description

This command is used to provide the user with a means to configure the IAA modules from the command line.

At any point during the execution of this command changes can be saved to the active configuration. If the users decide they do not want to save any changes made they can abort the program and leave the configuration unchanged.

### 3.5.1.5 Command syntax

From the command line a user in the maint group may execute this command to configure the IAA application.

**Table 8 <CommandName> command parameters and variables**

| Command    | Parameters and variables |
|------------|--------------------------|
| iaa_config | None (displays a menu)   |

1. From the main menu the user can select to configure Global system parameters or Output Destinations, which includes DFS or RKS pairs.

```

=====
Main Menu                                     Page 1 of 1
=====

1. Global Parameters
2. Output Destinations

=====
[S]ave      e[X]it      [N]extPage      [P]revPage      [Q]uit
Select: █

```

2. From the Global Parameter Screen the user can change any of the Global Parameters as described in section 3.4.2.3. The Daylight Savings field (DST) is used to populate the DST field in the Packet Cable file header when events are ftped to the RKS.

```

=====
Global Parameters                                     Page 1 of 1
=====
1. Element ID [00001]
2. Packet Cable Format Version [1]
3. Enable Daylight Saving [0]
4. UTC Offset [+000000]
5. Sending Mode [0]
* 6. Base EM File Path [/cbmdata/00/iaa/ftpout/]
7. EM File Path [ ]

Note: * Fields are not Editable
=====
[S]ave      [R]eturn    [N]extPage   [P]revPage   [Q]uit
Select: █

```

3. From the Output Destinations screen, Delivery Function or Record Keeping Server Destination configuration screens can be selected.

```

Status: None
=====
Output Destinations                                     Page 1 of 1
=====
1. Delivery Function Destinations
2. Record Keeping Server Destinations

=====
[S]ave      [R]eturn    [N]extPage   [P]revPage   [Q]uit
Select: █

```

4. From the Record Keeping Server screen the user can list the existing RKS destinations, create a new destination, copy an existing destination to a new destination, edit, view or delete an existing destination.

```

=====
Record Keeping Server Destinations                               Page 1 of 1
=====

1. List
2. New
3. Copy
4. Edit
5. View
6. Delete

=====
[Slave]      [R]eturn      [N]extPage      [P]revPage      [Q]uit
Select: █

```

5. From the new or edit selections, items described in section 3.4.2.1 can be configured.

```

Status: None
=====
RKS Destination Parameters                                     Page 1 of 3
=====

1. Channel ID           [ ]
2. Description           [ ]
3. Primary IP Address   [ ]
4. Primary RADIUS Port  [ ]
5. Secondary IP Address [ ]
6. Secondary RADIUS Port [ ]
7. Retry Limit          [3]
8. Retry Interval       [3]
9. Shared Secret        [0000000000000000]
10. Batch Interval      [3]
11. Messages In Batch   [5]

=====
[A]dd      [R]eturn      [N]extPage      [P]revPage      [Q]uit
Select: █

```

6. When the Delivery Function selection is made from the Output Destinations menu, the user is presented with the following screen. From the Delivery Function Server screen the user can list the existing DF destinations, create a new destination, copy an existing destination to a new destination, edit, view or delete an existing destination

```

=====
Status: None
=====
                        Delivery Function Destinations                Page 1 of 1
=====

1. List
2. New
3. Copy
4. Edit
5. View
6. Delete

=====
[S]ave      [R]eturn    [N]extPage    [P]revPage    [Q]uit
Select: █

```

7. From the new or edit selections, items described in section 3.4.2.2 can be configured.

```

=====
                        DF Destination Parameters                    Page 1 of 1
=====

1. Channel ID           [ ]
2. Description           [ ]
3. IP Address           [ ]
4. RADIUS Port          [ ]
5. Retry Limit          [3]
6. Retry Interval       [3]
7. Shared Secret        [0000000000000000]

=====
[A]dd      [R]eturn    [N]extPage    [P]revPage    [Q]uit
Select: █

```

### 3.5.1.6 Qualifications and warnings

Incorrect configuration of the system could result in lost event messages.

### 3.5.1.7 Responses

The program prompts the user through a menu for information to configure the IAA modules.

Host: oak > Tools Logout Help

Application Status | Viewers | View config files | SNMP Graphs | User Logins | System Administration | System Logs

---

**Event Viewer -- Settings** BCID Subquery report View report

**1 Query Start**

Start Date: 9/9/2004 Start Time: 00:00:00

**2 Query End**

End Date: 9/9/2004 End Time: 23:59:59

**3 Maximum Matches**

Max Matches: 10

**NOTE!** For best performance, limit the number of matches to display.

**4 Build Search Criteria**

|                    |   |  |
|--------------------|---|--|
| Channel ID         | = |  |
| Filename           | = |  |
| Originating Number | = |  |
| Terminating Number | = |  |
| Element ID         | = |  |
| BCID               | = |  |

This field not for use with BCID Subquery report.

View report

Host: oak > Tools Logout Help

Application Status | Viewers | View config files | SNMP Graphs | User Logins | System Administration | System Logs

---

**Event Viewer -- Results**

Report Created: Sep 9, 2004 6:45:10 PM

Date/Time Filter: Sep 8, 2004 12:00:00 AM - Sep 9, 2004 11:59:59 PM

Search Criteria: Event Message Type != NULL

|   | Processing Time     | Originating Number | Terminating Number | Event Message  | Element ID | Event Time         |
|---|---------------------|--------------------|--------------------|----------------|------------|--------------------|
| + | 09/09/2004 14:54:16 |                    |                    | CallAnswer     | 12345      | 20021114163757.805 |
| + | 09/09/2004 14:54:16 |                    |                    | CallAnswer     | 12345      | 20021114163757.815 |
| + | 09/09/2004 14:54:16 |                    |                    | CallDisconnect | 12345      | 20021114163801.987 |
| + | 09/09/2004 14:54:16 |                    |                    | SignalingStop  | 12345      | 20021114163801.987 |
| + | 09/09/2004 14:54:16 |                    |                    | SignalingStop  | 12345      | 20021114163802.114 |



### 3.6.1 Network configuration

**3.6.2** IPSec needs to be configured between the CBM and the downstream RKS pair or DF server. This is handled by the SSPSF, the IAA makes use of this feature.**Key management**

Once configured, key management is handled at the SSPSF level, the IAA makes use of this feature.

### 3.6.3 Protocol

IPSec is utilized by the IAA to send real-time events to the downstream RKS pair or DF server. SFTP can be used to send files to the RKS pair if the IAA is configured to do so.

### 3.6.4 Authentication

Access to the Web interface is controlled by the Java JAAS unix authentication method, which uses the same userid and password used to gain CLI access to the CBM. When a user attempts to log in to the Web interface, they must enter their userid and password which allows them access to the system. The user must also be in the maint group to gain access to the configuration and record viewing screens available via the web interface.

## 3.7 Configuration Walkthrough

Once installed the users is required to configure the IAA Global System Parameters, the desired DF(s) to which LI event messages will be delivered and the desired RKS pair(s) to which Accounting event messages will be delivered.

### 3.7.1 Creating Logical Volumes for use by the IAA

The following logical volumes are required before the installation of the IAA software.

1. `makelv /cbmdata/00/iaa/config 512`
2. `makelv /cbmdata/00/iaa/data 5120`
3. `makelv /cbmdata/00/iaa/ftpout 8192`
4. `makelv /cbmdata/00/iaa/kdb 17408`

### 3.7.2 Configure RKS Output Destination

1. On the Main User Interface, click on Configuration -> Output Destinations.
2. Click on Create a new RKS Destination
3. The RKS Output Destination Configuration user interface will appear, as below:



Host: [redwood](#) > [Configuration](#) [Global Parameters](#) | [Output D](#)

### RKS Output Destination Configuration

Channel ID:  Destination Type: RKS  
 Description:

FTP Direction: ☐ Inbound ☒ Outbound  
 Maximum File Length:  MB  
 Maximum File Open Time:  minutes  
 File Priority:   
 Schedule:   
 FTP Mode: ☒ FTP ☐ Secure FTP  
 Security Protocol: ☒ None ☐ IPsec

**Primary RKS**  
 IP Address:  RADIUS Port:   
 FTP Port:   
 Server username:  Server password:   
 Destination Directory:

**Secondary RKS**  
 IP Address:  RADIUS Port:   
 FTP Port:   
 Server username:  Server password:   
 Destination Directory:

Retry Limit:  Retry Interval:   
 Messages in Batch:  Batch Interval:   
 Shared Secret:

4. Enter the requested information such as Channel ID, Description, FTP Direction, Primary IP Address and Primary RADIUS Port.
5. If values other than the defaults are desired, enter them for the Maximum File Length, Maximum File Open Time, File Priority, Retry Limit, Retry Interval, Messages in Batch, Batch Interval, and Shared Secret
6. If selecting the FTP Direction as Outbound, select a Schedule, FTP Mode and the Security Protocol. Also, enter information for the Primary and Secondary FTP Port, Server username, Server password and Destination Directory if desired.
7. Click on Save Changes.

### 3.7.3 Configure DF Output Destination

1. On the Main User Interface, click on Configuration -> Output Destinations
2. Click on Create a new DF Destination

3. The DF Output Destination Configuration user interface will appear, as below:

The screenshot displays the 'DF Output Destination Configuration' page within the Nortel Networks Integrated Accounting Application. The page header includes the Nortel logo and the application name. The breadcrumb trail shows 'Host: redwood > Configuration'. The page title is 'DF Output Destination Configuration'. The form contains the following fields and values:

| Field          | Value            |
|----------------|------------------|
| Channel ID     |                  |
| Description    |                  |
| IP Address     |                  |
| RADIUS Port    |                  |
| Retry Limit    | 3                |
| Retry Interval | 3                |
| Shared Secret  | 0000000000000000 |

At the bottom of the form, there are two buttons: 'Reset form' and 'Save changes'.

4. Enter the requested information such as Channel ID, Description, IP Address and RADIUS Port
5. If values other than the defaults are desired, enter them for the Retry Limit, Retry Interval and Shared Secret
6. Click on Save Changes

### 3.7.4 Sending or Retrieving Files from the IAA

Accounting messages that are stored in files due to communication failures are automatically ftped to the RKS when communications to the destination are restored. In the event there is a need to retrieve the files before communications are restored, the following procedures can be used.

#### 3.7.4.1 Manually sending files from the IAA

1. Login into the IAA.
2. Go to the file staging directory (`cd /iaadata/ftpout/<channelID>`), where `channelID` is the channel ID of the destination, 1 to 255.
3. Transfer the file to the remote system. (`ftp remote host`).
4. Place the files on the remote host using the `ftp put` command.

#### 3.7.4.2 Manually retrieving a files from the IAA

1. From the remote host ftp into the IAA.

2. Go to the file staging directory (cd /iaadata/ftpout/<channelID>), where channelID is the channel ID of the destination, 1 to 255.
3. Using the ftp get command retrieve the requested file.
4. After the file is retrieved, copy the file to the secondary directory so that it is not sent downstream once the communication link is re-established. (cp <filename>../secondary/<ChannelID>).

### 3.7.5 Steps to Configure IPSec between the IAA and a remote RKS or DF

The following steps define the procedures to configure the IAA to communicate with a RKS, DF or GWC over a IPSec connection. The remote system must be configured in a similar fashion to allow for successful communications. The configuration files which need to be modified are found in the following directories:

| Directory        | File                                                                                                         |
|------------------|--------------------------------------------------------------------------------------------------------------|
| /etc/inet        | ipsecinit.conf (If this file does not exist copy /etc/inet/ipsecinit.sample to /etc/inet/ipsecinit.conf)     |
| /etc/inet/ike    | config (If this file does not exist copy /etc/inet/ike/config.sample to /etc/inet/ike/config)                |
| /etc/inet/secret | ike.preshared                                                                                                |
| /etc/inet/secret | ipseckeys (If this file does not exist copy /etc/inet/secret/ipseckeys.sample to /etc/inet/secret/ipseckeys) |

1. Edit the /etc/inet/ipsecinit.conf file to add an entry similar to the following: (note this is all on one line)

Sending host:

```
{ raddr 172.19.160.58 rport 1704 laddr 172.19.160.170 ulp udp dir both }
ipsec { encr_algs 3des encr_auth_algs sha1 auth_algs sha1 sa shared }
```

Receiving host:

```
{ raddr 172.19.160.170 laddr 172.19.160.58 lport 1704 ulp udp dir both } ipsec
{ encr_algs 3des encr_auth_algs sha1 auth_algs sha1 sa shared }
```

Where:

raddr is the ip address of the remote system

rport is the port number of the remote system

laddr is the ip address of the local system (if a cluster it is the cluster IP)

lport is the port number of the local system

2. Edit the /etc/inet/ike/config file so that the following values are set as described below. This only needs to be done for the first IPSec connection.

```
## Global parameters
#
## Phase 1 transform defaults
p1_lifetime_secs 604800
p1_nonce_len 40
#
## Defaults that individual rules can override.
p1_xform
{ auth_method preshared oakley_group 1 auth_alg sha encr_alg 3des }
p2_pfs 0
```

3. Also edit the `/etc/inet/ike/config` file to add an entry for each remote host as required, similar to the one below:

#### On the Sending Host:

```
{ label "cluster1-sundev3"
  local_addr 172.19.160.170
  remote_addr 172.19.160.58
  p1_xform
  { auth_method preshared oakley_group 1 auth_alg sha1 encr_alg 3des p1_lifetime_secs
    604800 }
  p2_pfs 2
}
```

#### On the Receiving Host:

```
{ label "cluster1-sundev3"
  local_addr 172.19.160.58
  remote_addr 172.19.160.170
  p1_xform
  { auth_method preshared oakley_group 1 auth_alg sha1 encr_alg 3des p1_lifetime_secs
    604800 }
  p2_pfs 2
}
```

#### Where:

label is any unique name

remote\_addr is the ip address of the remote system.

local\_addr is the ip address of the local host.

4. Edit the `/etc/inet/secret/ike.preshared` file to add an entry for each remote host as required, similar to the one below:

#### On the Sending Host:

```
{ localidtype IP
  localid 172.19.160.170
  remoteidtype IP
  remoteid 172.19.160.58
  key f1d8ab6cf3bf5f1232e1cea8cf4657e09a63b5b6b575dc3a
}
```

#### On the Receiving Host:

```
{ localidtype IP
  localid 172.19.160.58
  remoteidtype IP
  remoteid 172.19.160.170
  key f1d8ab6cf3bf5f1232e1cea8cf4657e09a63b5b6b575dc3a
}
```

#### Where:

label is any unique name

remoteid is the ip address of the remote system.

localid is the ip address of the local host.

key is a hex string.

5. After the changes to the files are made execute the following to start IpSec with the desired configuration:

```
pkill in.iked
/usr/lib/inet/in.iked
ipseckey -f /etc/inet/secret/ipseckey
ipsecconf -a /etc/inet/ipsecinit.conf
```

6. To verify the data is encrypted:  
on the receiving host:

```
snoop -v host 172.19.160.170

.
.
.
AH:  ----- Authentication Header -----
AH:
```

```

AH:  Next header = 50 (ESP)
AH:  AH length = 4 (24 bytes)
AH:  <Reserved field = 0x0>
AH:  SPI = 0xad42fdc1
AH:  Replay = 54745
AH:  ICV = 98d75a36720c3398cf18e35b
AH:
ESP:  ----- Encapsulating Security Payload -----
ESP:
ESP:  SPI = 0x70498dd0
ESP:  Replay = 54745
ESP:      ....ENCRYPTED DATA....

```

OR

```
snoop -x 0 host 172.19.160.170
```

Using device /dev/eri (promiscuous mode)

```
cluster1 -> sundev3    ESP SPI=0x70498dd0 Replay=56870
```

```

0: 0003 ba5c 454b 0000 bb71 f34e 0800 4500    ... \EK...q.N..E.
16: 0128 adcc 4000 ff33 33ca ac13 a0aa ac13    . (...@...33.....
32: a03a 3204 0000 ad42 fdc1 0000 de26 e34f    .:2....B.....&.O
48: 1672 0a50 c928 93f8 8246 7049 8dd0 0000    .r.P.(.ø.FpI....
64: de26 40ab 17fa 4bcb 9704 55a2 2c85 1bfa    .&@...úK...U.,...ú
80: 84f6 813e b7d2 75ec 5f0a 7894 0d40 0aae    ...>...u...x...@..
96: 7be6 8e93 629b 6f3b cfca 97cd b278 53bb    {...b.o;.....xS.
112: daed 33f8 bae1 3768 a171 7ef4 fcb9 6255    ..3ø..7h.q~...bU
128: 3904 bb38 73e5 d5b4 e5e0 5d11 bfee 1bbb    9..8s.....].....
144: d339 4d44 8a5f ee79 2093 9bdf 690b bcb3    .9MD...y ...i...
160: 19b2 321c 77dd 3d13 1dd3 64af 5bdc cbc5    ..2.w.=...d.[...
176: 4012 05ab a6e7 abe5 e508 9629 fedc 0876    @.....)p...v
192: 823e 1817 59eb 6109 8c41 4fa9 56b8 7a25    .>...Y.a..AO.V.z%
208: 9646 2e45 5a98 8521 3fe0 b914 a356 f074    .F.EZ...!?...V.t
224: 1450 35dc 5742 ada2 5e87 ee43 0180 1f99    .P5.WB...^..C....
240: 85ba abe0 7153 bee8 98ae d90c 3055 e413    ....qS.....0U..

```

```

256: a0df 5b03 be9e 0e8a 05b9 6da0 8ad6 4f6d    ..[.....m...Om
272: f670 eaf6 64b7 704a 567d 8e1a 89f3 87a3    .p..d.pJV}.....
288: f964 b542 7676 d089 89a0 a0b2 6d6f 7cac    ùd.Bvv.....mo|.
304: 0c4f c8e8 e675                                .O...u

```

## 3.7.6 Backing Up and Restoring Configuration Data

### 3.7.6.1 Backup Configuration Data

Configuration data can be backed up to any removable device by using the following commands:

1. Busy the IAA application modules, (IAA Accounting Event Message Processing, IAA Accounting Event Message Viewing, and IAA LI Event Message Processing).
2. Go to the configuration directory, (cd /iaadata/config).
3. Write the data to a removable media device, (tar cvf /dev/[device name] \*).
4. Restart the IAA application modules.

### 3.7.6.2 Restoring Configuration Data

Configuration data can be restored from any removable device by using the following commands:

1. Busy the IAA application modules, (IAA Accounting Event Message Processing, IAA Accounting Event Message Viewing, and IAA LI Event Message Processing).
2. Go to the configuration directory, (cd /iaadata/config).
3. Extract the data from the removable media device, (tar xvf /dev/[device name] \*).
4. Restart the IAA application modules.

## 3.7.7 Changing File Aging Parameters for the IAA

Processed and temporary files used by the IAA are removed from the system by programs run from the user maint's crontab file. This time a file resides on the system can be changed using the following procedures.

### 3.7.7.1 Record Viewing

Events which have not been delivered to the destination because of communication problems are made available for viewing for 1 day. On slower volume installations this can be set for a longer value by changing the following entry in the crontab file for the user maint.

```

30 0 * * * /usr/bin/ksh -c ". ./profile.iaa ; [ -x
/opt/nortel/cbm/21/iaa/bin/remove_aged ] &&
/opt/nortel/cbm/21/iaa/bin/remove_aged -d -a 1 -i

```

```
/cbmdata/00/iaa/data/etc/remove_dirs.include -x  
/cbmdata/00/iaa/data/etc/remove_dirs.exclude"
```

1. As the user root edit the crontab file for the maint user, (crontab -e maint).
2. Change the “-a1” to “-a X”.
3. Save the crontab file.

### 3.7.7.2 Temporary Files

Files that are used to process events are stored on the system for a period of 5 days. This can be set to a different value by changing the following entry in the crontab file for the user maint.

```
0 1 * * * /usr/bin/ksh -c ". ./profile.iaa ; [ -x  
/opt/nortel/cbm/21/iaa/bin/remove_aged ] &&  
/opt/nortel/cbm/21/iaa/bin/remove_aged -a 5 -i  
/cbmdata/00/iaa/data/etc/remove_aged.include -x  
/cbmdata/00/iaa/data/etc/remove_aged.exclude"
```

1. As the user root edit the crontab file for the maint user, (crontab -e maint).
2. Change the “-a5” to “-a X”.
3. Save the crontab file.

### 3.7.7.3 Temporary Files

Audit files are stored on the system for a period of 30 days. This can be set to a different value by changing the following entry in the crontab file for the user maint.

```
0 2 * * * /usr/bin/ksh -c ". ./profile.iaa ; [ -x  
/opt/nortel/cbm/21/iaa/bin/remove_aged ] &&  
/opt/nortel/cbm/21/iaa/bin/remove_aged -a 30 -i  
/cbmdata/00/iaa/data/etc/remove_audits.include -x  
/cbmdata/00/iaa/data/etc/remove_audits.exclude"
```

1. As the user root edit the crontab file for the maint user, (crontab -e maint).
2. Change the “-a30” to “-a X”.
3. Save the crontab file.

## 4: Performance for A00007465

### 4.1 Performance management strategy

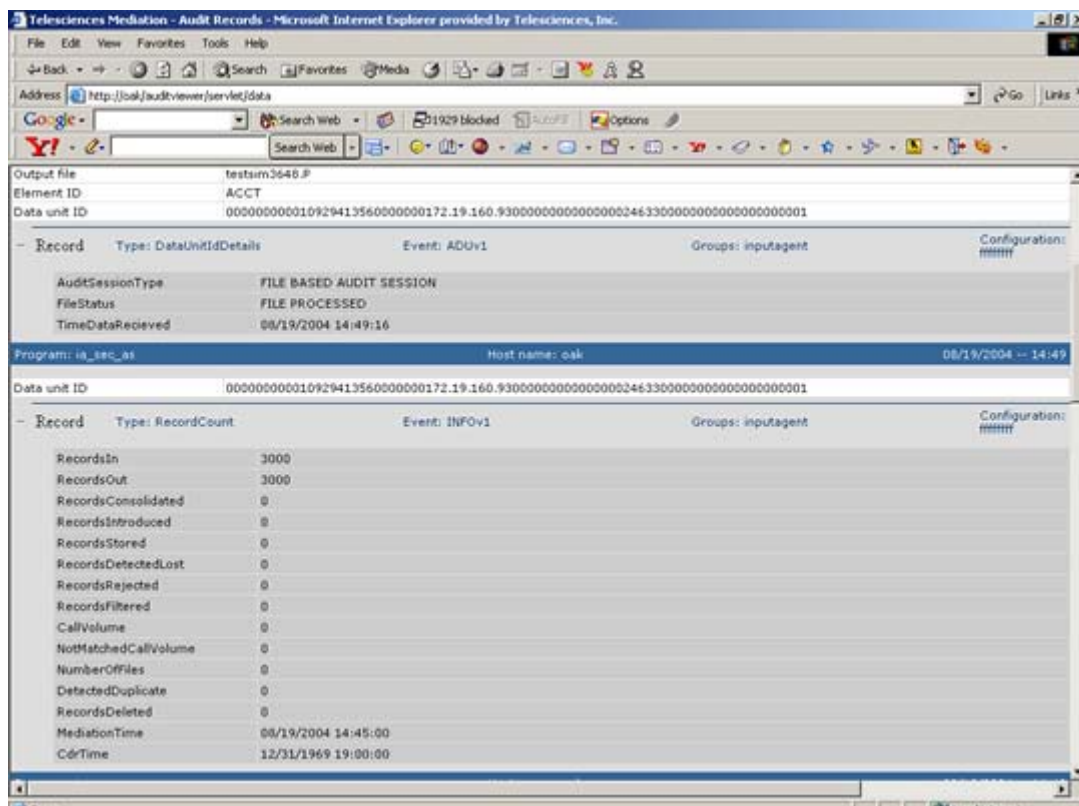
Auditing information is available for each module delivered as part of the IAA which processes Accounting and Legal Intercept Event Messages. In the case of Legal Intercept Event Messages auditing can be disabled by changing the the LI Collector's configuration file. The purpose of the auditing is to provide the end user with a summary of the number of records received and the number of records sent downstream. This serves as a way for the end user to verify that



no events were lost during processing. Audits are created in 15 minute intervals by each module, with the exception of the SBA Input agents which create audit entries per file processed.

## 4.2 Performance management tools and utilities

The audits created by the IAA modules are stored in XML files on the system and are viewable via the Web Interface provided. Each module will audit the number of records in and out of the process for each 15 minute interval, with the exception of the SBA Input agents which create audit entries per file processed. In addition to these two counts the EMDA will also provide audits for the number of records which retries were attempted and the number of records written to a file.



## 4.3 Performance Measurements (PM), Operational Measurements (OM), and stats

Each module will provide the following OMs:

- Records In
- Records Out
- Channel Type (EMDA Module Only)

- Channel ID (EMDA Module Only)
- Events Sent (EMDA Module Only)
- Acknowledgements Received (EMDA Module Only)
- Events Retransmitted (EMDA Module only)
- Events Written to File (EMDA Module only)
- Events Rejected (EMDA Module Only)
- Last Event Message Header Sequence Number (EMDA Module Only)

#### 4.3.1 PM, OM, and stats format

The OM stats (audits) are stored in an XML file, an example of which is shown below:

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<!DOCTYPE applicationinfo SYSTEM
"file:/telesci/application_home/./config/caching.dtd">
<applicationinfo applicationname="oak" hostname="oak" processid="24675"
programname="ia_pri_as" type="ST5000" version="1.0.0.0">

  <session datehex="1093034797" datestring="08/20/2004 16:46:37"
id="Session4">
    <category name="AUDITS"/>
    <appdataunit appspecname="" create="FALSE" datasourcename=""
dataunitid="00000000000109303479600000000172.19.160.9300000000000000
00
246750000000000000000000000001">
      <tableinfo infoid="InfoId4">
        <tabletype name="RecordCount"/>
        <event name="INFOv1"/>
        <grouplist>
          <group name="inputagent"/>
        </grouplist>
        <configuration id="ffffff"/>
        <fieldlist>
          <field length="10" name="RecordsIn" show="TRUE" type="INTEGER"
value="5"/>
          <field length="10" name="RecordsOut" show="TRUE"
type="INTEGER" value="5"/>
          <field length="10" name="RecordsConsolidated" show="TRUE"
type="INTEGER" value="0"/>
          <field length="10" name="RecordsIntroduced" show="TRUE"
type="INTEGER" value="0"/>
          <field length="10" name="RecordsStored" show="TRUE"
type="INTEGER" value="0"/>
        </fieldlist>
      </tableinfo>
    </appdataunit>
  </session>
</applicationinfo>
```

```

        <field length="10" name="RecordsDetectedLost" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="RecordsRejected" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="RecordsFiltered" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="CallVolume" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="NotMatchedCallVolume" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="NumberOfFiles" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="CallDuration" show="FALSE"
type="INTEGER" value="0"/>
        <field length="10" name="NotMatchedCallDuration" show="FALSE"
type="INTEGER" value="0"/>
        <field length="10" name="DetectedDuplicate" show="TRUE"
type="INTEGER" value="0"/>
        <field length="10" name="RecordsDeleted" show="TRUE"
type="INTEGER" value="0"/>
        <field length="20" name="MediationTime" show="TRUE"
type="DATE-STANDARD" value="08/20/2004 16:45:00"/>
        <field length="20" name="CdrTime" show="TRUE" type="DATE-
STANDARD" value="12/31/1969 19:00:00"/>
    </fieldlist>
</tableinfo>
</appdataunit>
</session>

</applicationinfo>
</applicationinfo>

```

***Product = CS 2000***

## **A00007483--GR740 Secure using SSH**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS

## 1.2 Description

The purpose of this feature is to provide a new scheme for securing the TCP/IP connections used for carrying GR-740<sup>1</sup> data between a CBM or SDM<sup>2</sup> and an OSS. This new scheme will ultimately replace the current DCE security scheme, but in the short term, both security schemes must co-exist. Hence, both the CBM and the OSS sides must support both schemes.

The connections shall be secured using the industry-standard SSH<sup>3</sup> security scheme, which provides transparent 128-bit encryption (and decryption), data integrity, and user and node authentication. On the CBM-side, the SSH product to be used shall be OpenSSH<sup>4</sup> version 3.8.

The connections between the CBM and the OSS will be established from the OSS-side using an SSH technique known as *local port forwarding*. Port forwarding allows forwarding of TCP/IP connections to a remote machine over an encrypted channel and allows those forwarded ports to be used securely by other TCP/IP-based applications. All data flowing through the forwarded port is automatically encrypted and authenticated. In this configuration, the OSS is the (local) client and the CBM is the (remote) server. Depending on the end office configuration, GR740 requires the setup of up to six connections from the OSS to the CBM, and for the purposes of this feature, each connection would have to be separately port-forwarded. The exact means of establishing the required port-forwarded connections is left to the discretion of each individual OSS vendor.

Local port forwarding can be accomplished using variants of the following basic command:

- `ssh -L oss_port:localhost:cbm_port cbm_ip_addr`

Where *cbm\_port* is one of the six standard GR740 ports, i.e. 9550 - 9555, *oss\_port* is any available port on the OSS node (as per vendor), and *cbm\_ip\_addr* is the IP or DNS address of the CBM node.

Connections to the remote server can be authenticated using user names and passwords or public/private key-pairs<sup>5</sup>, at the OSS vendor's or customer's discretion. Public/private key-pairs particularly simplify login with only minimal extra effort required to initially configure the keys.

---

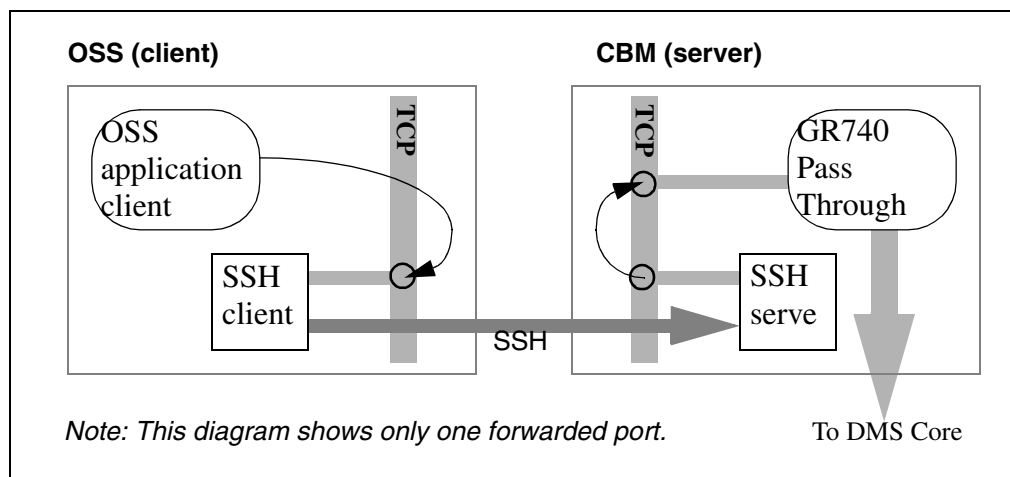
1. And GR-746 data, as applicable to the office configuration.

2. For the remainder of this document, CBM shall be used to refer to both CBM and SDM products, unless otherwise stated.

3. For more information on SSH, please refer to any applicable published text such as "SSH, The Secure Shell: The Definitive Guide" by Barrett & Silverman (O'Reilly).

4. For more information on OpenSSH, please visit <http://www.openssh.org>.

5. Following SSH upgrades on the OSS software, public/private key pairs will have to be regenerated.

**Figure 1 Local port forwarding in an OSS-CBM configuration**

Since the connections have to be established by the OSS, it must also handle the detection and re-establishment of dropped connections. If a connection is lost, the OSS will be responsible for detecting the drop and re-connecting.

To help facilitate dropped connection detection, the ssh server daemon (i.e. *sshd*) on the CBM side has been configured for KeepAlive functionality, and thus any and all SSH connections to the CBM will implicitly use the KeepAlive feature. With KeepAlive set to 'yes' (default), the CBM will periodically transmit keepalive messages to the OSS; if no response is received within the timeout period, the connection is considered to be in error and the CBM will shut the connection down. The *sshd* KeepAlive interval is the generic TCP KeepAlive interval<sup>6</sup>, which is already set to 2 minutes (120000ms) in the CBM and will not be changed. Please note that the CBM's TCP KeepAlive interval value of 2 minutes is significantly less than the default value of more than an hour for most Unix-based systems.

A similar KeepAlive feature is available for client-side SSH, and as such should be available on the OSS. As with the server (CBM) side KeepAlive, the OSS can send keepalive messages to the CBM; if no response is received within the timeout period, the connection is considered to be in error and the OSS will shut the connection down. However, it is important to note that the SSH client KeepAlive setting and the OSS TCP KeepAlive interval are set as per each vendor's discretion. The vendor may also decide to implement a separate keepalive mechanism at the OSS application level.

On the CBM side, changes are generally limited to GR740 Pass Through configuration procedures. When configuring the GR740 Pass Through feature, the options presented to the user will depend on system configuration. During GR740 Pass Through configuration on CBMs and on non-DCE-provisioned

6. Parameter name: *tcp\_keepalive\_interval*

SDMs, users will be presented with a menu consisting of two choices: *Non-secure*; and *Local (SSH) security*. For GR740PT configuration on SDMs which have the DCE installed and activated, users will first be asked if they want to enable DCE security for GR740PT. If they respond positively, then they will be prompted for the DCE userid and password. If the userid and password are valid, or if they answered ‘No’ to the original DCE security question, they will be presented with a menu listing 3 choices: *Non-secure*; *Local (SSH) security*; and *DCE security*.

By selecting the *Local (SSH) security* scheme, only SSH-secured external connections will be permitted to the GR740PT processes (and unsecured connections will not be permitted). This point implies that in order to access the GR740PT processes from another node (e.g. OSS), a port-forwarded SSH tunnel must first be established between the remote node and the CBM or SDM for each GR740PT port to which access is required. In *Local (SSH) security* mode, connections from within the CBM or SDM to the GR740PT processes (i.e. by local users already logged into the node) do not require an inter-nodal SSH tunnel.

If *DCE security* is chosen as the security scheme, then DCE security is established (as per previous software releases). Note that even if the user answered ‘No’ to the DCE security question asked prior to the displaying of the security options menu, *DCE security* can still be selected; the user will simply be prompted for the DCE userid and password at that point.

If the *Non-secure* option is chosen, unsecured connections originating from any node to GR740PT will be permitted (as per previous software releases), but SSH-secured external connections are also possible.

**Note:** The “authorized GR740 users only” requirement described above for the SSH security mode has been deferred to SN09/CBM22. The deferral is being tracked via CR.Q00990244.

## 1.3 Hardware Requirements or Dependencies

None.

## 1.4 Software Requirements or Dependencies

This feature will depend on the SN08/SDM21 software load for the SDM and CBM products.

As this feature deals with the use of OpenSSH on the CBM and SDM products, there is also a dependency on OpenSSH 3.8. Any SSH-related functionality described as part of this feature must work with OpenSSH 3.8. The SSH product used by the individual OSS vendors must also function properly with OpenSSH 3.8.

The system for indicating authorized GR740 users will be the standard user authorization system for the CBM and SDM platforms. The standard authorization mechanism in SDM/CBM is based on user groups and is being modernized as part of activities A00007492SDM “User Group Administration -- 2324” and A00007489SDM “Integration Of SDM User Authentication With IEMS -- 2189” both delivered in this release (SN08). Conformance to the new authorization framework will allow GR740 user authentication and authorization to be centrally managed.

There are no explicit Core software dependencies; Core loads which support CBM08/SDM21 are the only pre-requisite.

## 1.5 Limitations and restrictions

If, when configuring GR740 on the CBM, the user chooses the non-secure or DCE options, then this feature will have no effect.

This feature is limited to providing a security option for GR740 connections TCP/IP only. No other types of connections or applications are supported/affected by feature A00007843, although SSH is available to all TCP connections and applications which use those connections.

## 1.6 Interactions

This feature will interact with the existing GR740 functionality on the CBM. The effects of the changes will be to provide a new means of securing GR740 TCP/IP connections between the OSS and the CBM. After initial configuration, any impacts of the changes should be transparent to the users.

## 1.7 Glossary

| Term | Description               |
|------|---------------------------|
| CBM  | Core & Billing Manager    |
| DCE  | Dispatcher Control Entry  |
| OSS  | Operations Support System |
| SDM  | SuperNode Data Manager    |
| SSH  | Secure SHell              |

***Product = CS 2000***

# A00007489--Integration of SDM User Authentication with the IEMS

## *Functional Description*

### **1.1 Applicable Solution(s)**

DMS, PT-AAL2

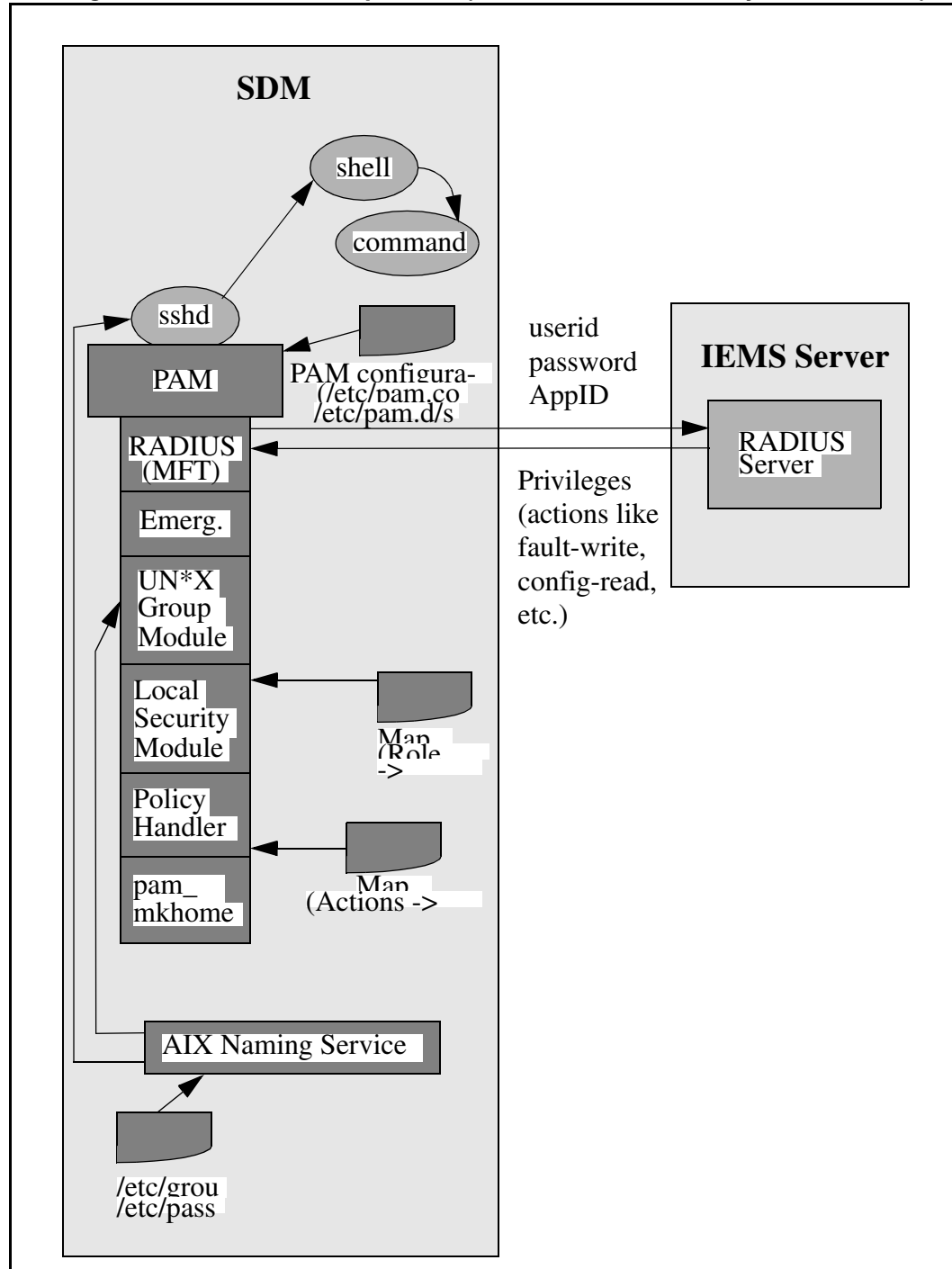
### **1.2 Description**

This feature is designed to support SDM integration with IEMS. It provides the following security functionality:

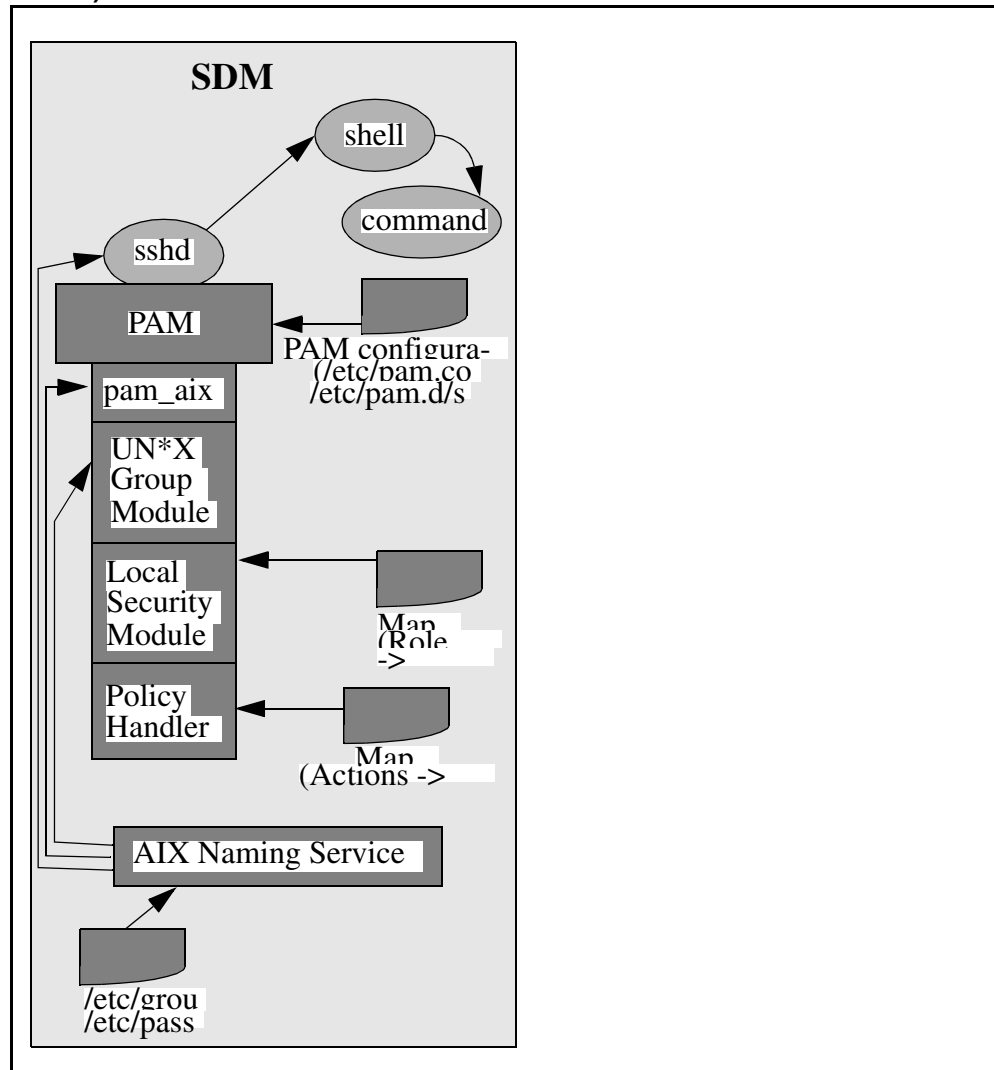
- Utilize the centralized security management of IEMS to provide Authentication, Authorization, Accounting functions.
- Support PAM on SDM to allow AAA via IEMS.
- Allow local emergency access when communication to IEMS is down.
- Support AAA through local security management when IEMS is not part of the SDM deployment.
- Enable access control based on user authorization.

The following two figures show the two deployment scenarios for user authentication/authorization.



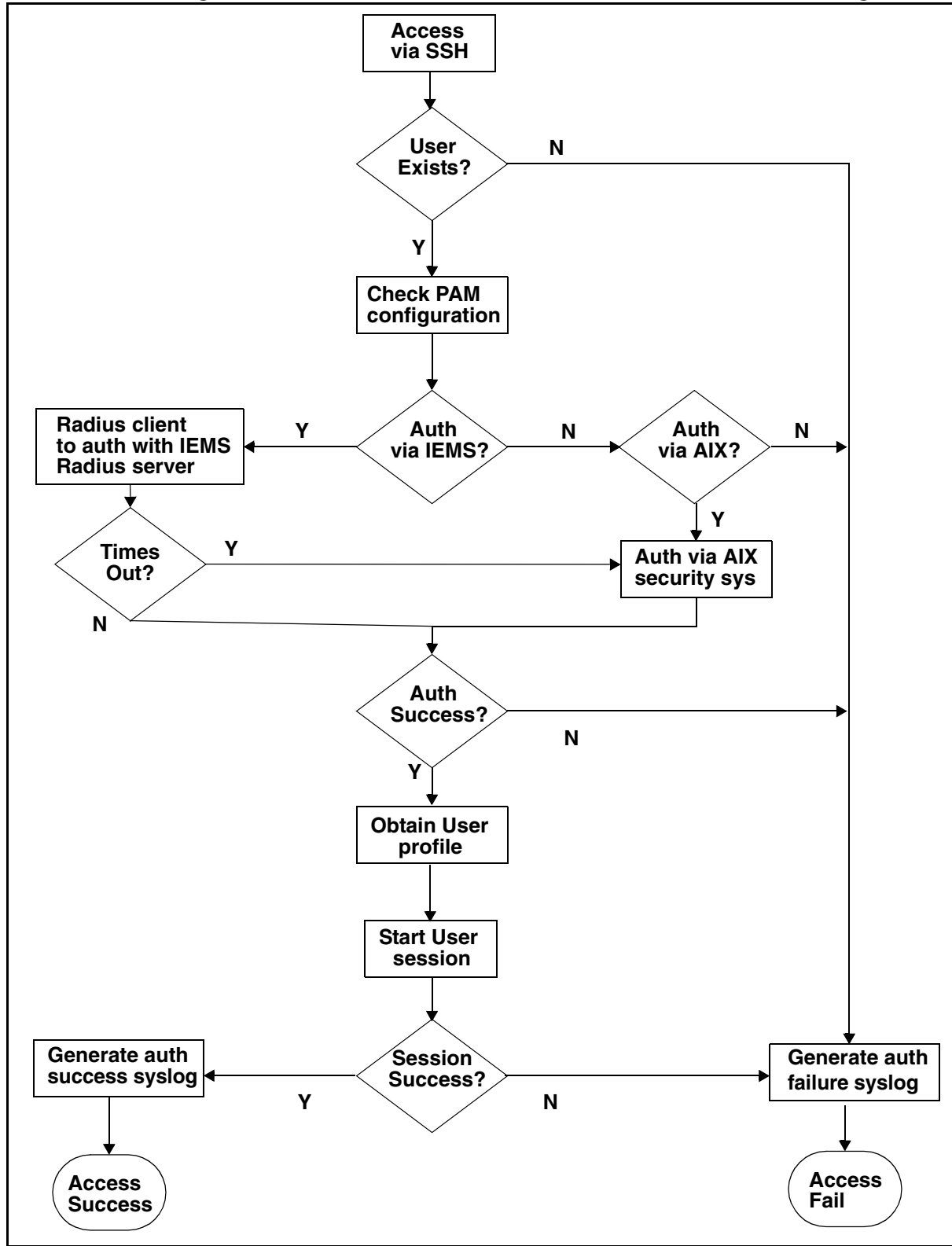
**Figure 1 Functional Components (with Centralized Security Server - IEMS)**

The above figure shows the users are authenticated remotely by a central security server (Centralized Authentication): SDM users are authenticated by a RADIUS server running on an IEMS server.

**Figure 2 Functional Components (Standalone SDM without External Security Server)**

The above figure shows users are authenticated locally on an SDM (Standalone SDM): There is no central security server. Users and their authentication/authorization information is stored locally in this case.

The following is a flow chart for user authentication and authorization through SSH.

**Figure 3 Flow chart for user authentication and authorization through SSH**

Emergency access is needed to address any system issue which impacts user authentication. Based on the different needs for emergency access, it is recommended you use local root user accounts for emergency access for both SDM deployment with IEMS and without IEMS.

The following is an example of emergency access:

- SSH demon is not available. No user will be able to access the system through SSH. The only way for a user to access the system in such a case is through console access with a local root account.

### 1.3 Hardware Requirements or Dependencies

No new hardware dependency is introduced in this feature for Standalone SDM deployment without a centralized security server.

For SDM deployment with the IEMS centralized security server, IEMS and its hardware dependencies are needed by this feature.

### 1.4 Software Requirements or Dependencies

No new software dependency is introduced in this feature for Standalone SDM deployment without a centralized security server.

For SDM deployment with the IEMS centralized security server, IEMS and its software dependencies are needed by this feature.

### 1.5 Limitations and restrictions

- When a SDM user account is created on IEMS, the user account also needs to be added on each SDM via an AIX script/command (e.g. mkuser).
- User password expiry warning is only available on IEMS.
- When a SDM is changed from a standalone configuration to a centralized IEMS security server configuration, all the exiting local user accounts on the standalone SDM need to be created on the IEMS server.
- Console/telnet login is only available for authorized user accounts that exist locally on a SDM. In addition, a user login through console/telnet will not get her/his role groups translated to command groups.
- A user can only su (change user) on a local user account. In addition, a user login through su will not get her/his role groups translated to command groups.
- SSH/SFTP login through a public key will not go through PAM authentication, as a result, an SSH/SFTP user login using a key will not get their command groups set based on the role groups she/he has, and the home directory will not be created automatically upon login. The administrator will have to set the command groups and create the home directory on every SDM for every user using key authentication.

## 1.6 Interactions

### Changes to Network Connectivity Applications

The following table shows the impact of this feature on network connectivity applications.

**Table 1 Network Connectivity Applications**

| Application          | Current Release | SN08    | Configurable - i.e. Turn On/Off (Y/N) | Support IEMS central security server (Y/N) |
|----------------------|-----------------|---------|---------------------------------------|--------------------------------------------|
| SSH (with password)  | Enable          | Enable  | N                                     | Y                                          |
| SFTP (with password) | Enable          | Enable  | N                                     | Y                                          |
| SSH (with key)       | Enable          | Enable  | N                                     | N                                          |
| SFTP (with key)      | Enable          | Enable  | N                                     | N                                          |
| Telnet               | Enable          | Disable | Y                                     | N                                          |
| FTP                  | Enable          | Disable | Y                                     | N                                          |
| Login                | Enable          | Disable | Y                                     | N                                          |
| Console access       | Enable          | Enable  | N                                     | N                                          |
| su                   | Enable          | Enable  | N                                     | N                                          |

**Note:** It is recommended that Telnet and FTP applications should not be used since SSH and SFTP are more secure tools.

By default, Telnet, FTP and Login services will be disabled after an SDM is freshly installed with SN08 software. However, these services will be kept as they were, after an SDM is upgraded to SN08 software from a previous release. It is strongly recommended that the administrators on customer sites change the configuration to turn these services OFF through sdmmtc.

When a network connectivity service is not integrated to work with a central security server, the service can only permit access to users who have accounts locally on an SDM.

## 1.7 Glossary

| Term | Description                               |
|------|-------------------------------------------|
| AAA  | Authentication, Authorization, Accounting |
| CBM  | Core and Billing Manager                  |
| IEMS | Integrated Element Manager System         |
| LDAP | Light-weight Directory Access Protocol    |
| MFT  | Management Framework Technology           |
| NE   | Network Element                           |
| OSS  | Operations Support System                 |
| PAM  | Pluggable Authentication Module           |
| SAML | Security Assertion Markup Language        |
| SDM  | SuperNode Data Manager                    |
| SSL  | Secure Sockets Layer                      |
| SSO  | Single Sign-On                            |
| VSA  | Vendor Specific Attributes                |

## 2: Fault Management for A00007489

### 2.1 Fault management strategy

The feature will log security events related to authentication and authorization. Syslog will be used for this feature to deliver the logs.

### 2.2 Fault management tools and utilities

#### 2.2.1 Faults, Alarms and Logs

Standard Syslog utilities will be used for this feature.

### 2.3 Logs

Authentication succeeded.

Log Title/Log ID: SN08 Authentication and Authorization Security Syslog

#### 2.3.1 Formats

*Note:* Only Syslog will be used for this feature.

**2.3.1.1 NTSTD**

Not applicable to this feature.

**2.3.1.2 SCC2**

Not applicable to this feature.

**2.3.1.3 Syslog**

The following is the format for the Authentication and Authorization Security log. It is based on Nortel OA&M Security IPT's Security Audit Logs Format Specification issue 1.1.

```
<PRI> "date time" "host" "program[pid]:" class_security.ver01
"Message_tag"="Message_value" ...
```

The following is an example for the Authentication and Authorization Security Syslog.

```
<157> Sep 17 15:42:40 wcary015 pam_policy_handler[15822]: class_security.ver01 DOC=SSH
Access STAT=Success SRC.USER=iemsuser EVNT.TYP=USER_ACT_Login
MID=SDM_MID_defn.security.123 SRC.OFFEND=47.1.2.3
```

**2.3.1.4 SNMP**

Not applicable to this feature.

**2.3.1.5 Integrated Element Manager GUI Fields**

Not applicable to this feature.

**2.3.2 Explanation**

Description: The Authentication and Authorization Security Syslog is generated when a security event occurs on a SDM. They are created for information purposes.

**2.3.3 Field descriptions**

**Table 2 Field descriptions**

| Field     | Value                          | Description                                                                         |
|-----------|--------------------------------|-------------------------------------------------------------------------------------|
| PRI       | 157                            | Priority value = Facility x 8<br>+ Severity = local3 (19) x 8<br>+ Notice (5) = 157 |
| Date time | Sep 17 15:42:40                | Month, day and timestamp                                                            |
| host      | wcary015                       | SDM system identifier                                                               |
| Program   | e.g. pam_policy_handler<br>RMI | The name of the SDM<br>process which generated<br>the log                           |

**Table 2 Field descriptions**

| Field                | Value                                                                                                                                                                                                                                                                                                                                                            | Description                                                                                            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| PID                  | 15822                                                                                                                                                                                                                                                                                                                                                            | The process ID of the SDM process which generated the log                                              |
| class_security.ver01 | constant value                                                                                                                                                                                                                                                                                                                                                   | Message category                                                                                       |
| DOC                  | SSH Access<br>Naming Service Change<br>PAM Config Change<br>Radius Config Change                                                                                                                                                                                                                                                                                 | Document field of the accessed resource                                                                |
| STAT                 | Success<br>Failure                                                                                                                                                                                                                                                                                                                                               | Status of the designed process                                                                         |
| SRC.USR              | e.g. iemsuser                                                                                                                                                                                                                                                                                                                                                    | Login user name or user id (not effective user name or user id).                                       |
| EVNT.TYP             | USER_ACT_Security_Login<br>USER_ACT_Security_Naming_Service_Change<br>USER_ACT_Security_PAM_Auth_Stack_change<br>USER_ACT_Security_Radius_Server_IP_Change<br>USER_ACT_Security_Radius_Secret_Change<br>USER_ACT_Security_Radius_Server_Timeout<br>USER_ACT_Security_SAML_Server_IP_Change (Post SN08)<br>USER_ACT_Security_SAML_Server_Login_Change (Post SN08) | The type of the event                                                                                  |
| MID                  | SDM_MID_defn.security.123 <sup>a</sup>                                                                                                                                                                                                                                                                                                                           | Message Identifier is a unique string to allow message text to change without affecting analysis tools |



**Table 2 Field descriptions**

| Field      | Value    | Description                       |
|------------|----------|-----------------------------------|
| SRC.OFFEND | 47.1.2.3 | Address of the originating packet |

a. SDM\_MID\_defn.security.123 is an example MID for this feature. The final MID will be provided later.

### **2.3.4 Action**

The Authentication and Authorization Security Syslog for this feature is displayed for information purpose only. No further action is needed for handling these logs.

### **2.3.5 Associated Operational Measurements or Performance Measurements**

Not applicable to this feature.

### **2.3.6 Additional information**

Not applicable to this feature.

## **2.4 Alarms**

Not applicable to this feature.

## **2.5 Related documentation**

# **3: Configuration for A00007489**

## **3.1 Hardware and Software Requirements**

SN08 SDM standard hardware and software are required.

No new hardware is needed for this feature. However, the software for this feature needs to be installed on the SDM before feature configuration can take place.

For SDM deployment with the IEMS centralized security server, IEMS and its hardware and software dependencies need to be available and configured.

## **3.2 Initial Configuration**

- No hardware initial configuration for this feature.
- The initial software configuration for this feature uses the local security server (i.e. native AIX security system) for authentication and authorization. No user input is needed for initialization.

### 3.3 Office/Subnet parameters (OP/SP) (CM & SESM)

Not applicable to this feature.

## 3.4 Upgrade Considerations

### 3.4.1 Dump and Restore (CM)

Not applicable to this feature.

### 3.4.2 Element Management Upgrade

No impact on the Element Management Upgrade when a SDM is deployed without an external security server.

When a SDM is deployed with the IEMS centralized security server in SN08, the SDM is changed from using the Pre-SN08 local security system to the external security server. In order to migrate to central authentication and authorization, some of the existing local user accounts need to be created on the external security server - IEMS.

The following are the steps for migrating SDM local user accounts to IEMS:

- Login to a SDM and determine which SDM user accounts need to be exported to IEMS. e.g. Local the SDM root account should not be exported to IEMS.
- Obtain the list of the user accounts which need to be migrated to the central server for every SDM.
- Create the accounts on the IEMS security server manually with the list of import SDM user accounts. One local user account can exist on many SDMs and it only needs to be created once on the IEMS server.

### 3.4.3 Downgrade impact

No impact on downgrade if the SDM feature installation is aborted.

### 3.5 Data schema (DS) (CM, MIBS, RDB)

Not applicable to this feature.

### 3.6 Service Orders (SO) (CM & SESM)

Not applicable to this feature.

### 3.7 Software optionality control (SOC)

Not applicable to this feature.

### 3.8 Element Management

Not applicable to this feature.

## 3.9 User interface changes

### 3.9.1 Directory: sdmmtc;SDMConfig

SDM Config level menu will not be changed by this feature. It will be used to commission the feature software.

### 3.9.2 Command: Step

Step command from the SDM Config level menu will not be changed by this feature. It will be used to commission the feature.

#### 3.9.2.1 Security Servers Configuration

A new configuration screen will be presented for selecting security servers for this feature.

**Table 3 Security Servers Configuration prompts and options**

| Configuration prompts                    | Options                                                                            |
|------------------------------------------|------------------------------------------------------------------------------------|
| Available Auth Naming Server:            | LOCAL<br><br>Note: Options that may available in the future - SAML, LDAP.          |
| Enter Authentication Naming Server?      | User Response<br><br>Enter the Auth Naming Server. e.g. LOCAL                      |
| Available Auth PAM Stack:                | LOCAL, IEMS<br><br>Note: Options that may available in the future - LDAP.          |
| Enter Authentication PAM Stack?          | User Response<br><br>Enter the Auth PAM Stack. e.g. LOCAL                          |
| Enter Radius Server IP? <sup>a</sup>     | User Response<br><br>Enter the IP address of the external Radius server.           |
| Enter Radius Port Number? <sup>b</sup>   | User Response<br><br>Enter the shared port number of the external Radius server.   |
| Enter Radius Shared Secret? <sup>c</sup> | User Response<br><br>Enter the Radius shared secret of the external Radius server. |

a. Available only when IEMS is selected for Auth PAM Stack.

b. Available only when IEMS is selected for Auth PAM Stack.

c. Available only when IEMS is selected for Auth PAM Stack.

### 3.9.2.2 Example

The following shows the example screens for configuring local authentication naming service with the local authentication PAM module. Please note this is the default security servers setting. Therefore, the customers do not need to invoke SDM Config level for the default setup.

```

SDM      CON      512      NET      APPL      SYS      HW      CLLI: SNM2
ISTb     .        . .      -        ISTb     .        .        Host: wcary2p2
                                M M                                Fault Tolerant

SDMConfig
0 Quit
2 Add      # Commissioning Step      Status / Value
3 Change  6 CLLI and Location Code SNM2: 1 A 2 3
4 Delete   7 Network Security          Commissioned
5           8 Ethernet Connectivity    Commissioned
6 Next     9 DS512 Connectivity        Commissioned
7 Prev    10 X25 Connectivity          Uncommissioned
8          11 Gateway IP Address       47.135.213.1
9 List     12 Core Communication Path  Commissioned
10 Step    13 Network Nodes            Commissioned
11          14 Edge Node Monitoring    Uncommissioned
12 Up      15 Network Time Protocol    Uncommissioned
13 Down    16 DCE                      Uncommissioned
14          17 Security Servers         LOCAL/LOCAL
15                                     Commissioning Steps: 6 to 17 of 17
16
17 Help
18 Refresh

root
Time 00:59 >

```

```

SDM      CON      512      NET      APPL      SYS      HW      CLLI: SNM2
ISTb     .        . .      -        ISTb     .        .        Host: wcary2p2
                                M M                                Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL

```

```

3 Change
4 Delete  Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14          Security Servers
15          Configure Authentication Naming Server and PAM Stack.
16          Use the Change to change the settings.
17 Help
18 Refresh  Type Next to continue with the next commissioning step, Prev to go
            root      back, or List to display a list of available commissioning steps.
Time 00:49 >

```

```

SDM      CON      512      NET      APPL      SYS      HW      CLI: SNM2
ISTb     .        . .      -        ISTb     .        .      Host: wcary2p2
                M M                                Fault Tolerant

```

```

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete  Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14          Security Servers

```

```
15          No alternative Authentication Naming Server and PAM Stack
16          is available. Please install alternative Naming Server or PAM Stack.
17 Help
18 Refresh  Press Enter to continue...
          root
Time 00:49 >
```

```
          SDM      CON      512      NET      APPL      SYS      HW      CLLI: SNM2
          ISTb     .       . .      -      ISTb     .       .      Host: wcary2p2
                                M M                                Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14          Security Servers
15          Configure Authentication Naming Server and PAM Stack.
16          Use the Change to change the settings.
17 Help
18 Refresh  Type Next to continue with the next commissioning step, Prev to go
          root back, or List to display a list of available commissioning steps.
Time 00:49 >
```

The following are example screens for configuring the local authentication naming service with the Radius authentication PAM module. The Radius PAM module option will only be shown if the PAM Radius client software for this feature is installed on the SDM. The Radius server address, port number and secret need to be entered by the users for this configuration.

```
SDM      CON      512      NET      APPL      SYS      HW      CLI: SNM2
ISTb     .        . .      -        ISTb     .        .      Host: wcary2p2
                        M M                        Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14          Change Authentication Naming Server
15          Available Auth Naming Server: LOCAL
16          Enter Authentication Naming Server: [LOCAL]
17 Help
18 Refresh
    root
Time 00:49 >
```

```
SDM      CON      512      NET      APPL      SYS      HW      CLI: SNM2
ISTb     .        . .      -        ISTb     .        .      Host: wcary2p2
                        M M                        Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
```

```
9 List
10 Step
11
12 Up
13 Down
14      Change Authentication PAM Stack
15      Available Auth PAM Stack: LOCAL, IEMS
16      Enter Authentication PAM Stack: [LOCAL]
17 Help
18 Refresh
    root
Time 00:49 >
```

|      |     |     |     |      |     |    |                |
|------|-----|-----|-----|------|-----|----|----------------|
| SDM  | CON | 512 | NET | APPL | SYS | HW | CLLI: SNM2     |
| ISTb | .   | . . | -   | ISTb | .   | .  | Host: wcary2p2 |
|      |     | M M |     |      |     |    | Fault Tolerant |

```
SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14      Configure Radius client
15      Enter Radius Server IP: [12.345.678.9]
16
17 Help
18 Refresh
    root
Time 00:49 >11.222.333.444
```



```
SDM      CON      512      NET      APPL      SYS      HW      CLLI: SNM2
ISTb     .        . .      -        ISTb     .        .        Host: wcary2p2
                        M M                                Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14          Configure Radius client
15          Enter Radius Port Number: [1812]
16
17 Help
18 Refresh
    root
Time 00:49 >
```

```
SDM      CON      512      NET      APPL      SYS      HW      CLLI: SNM2
ISTb     .        . .      -        ISTb     .        .        Host: wcary2p2
                        M M                                Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
```

```
7 Prev
8
9 List
10 Step
11
12 Up
13 Down
14      Configure Radius client
15      Enter Radius Shared Secret: [use configured value] *****7
16
17 Help
18 Refresh
    root
Time 00:49 >

SDM      CON      512      NET      APPL      SYS      HW      CLI: SNM2
ISTb     .         . .      -        ISTb     .         .      Host: wcary2p2
                M M                                Fault Tolerant

SDMConfig
0 Quit
2 Add      Auth Naming Server: LOCAL
3 Change
4 Delete   Auth PAM Stack: LOCAL
5
6 Next
7 Prev
8
9 List
10 Step
11
12 Up      Security Servers
13 Down    Values to be changed:
14          Auth Naming Server: LOCAL
15          Auth PAM Stack: IEMS
16
17 Help      Proceed with these values?
```

---

7. Stars will be shown in SN08 but will not be shown in future releases.

18 Refresh Enter Y to confirm, N to reject, or E to edit:

root

Time 01:36 > Y

|      |     |     |     |      |     |    |                |
|------|-----|-----|-----|------|-----|----|----------------|
| SDM  | CON | 512 | NET | APPL | SYS | HW | CLLI: SNM2     |
| ISTb | .   | . . | -   | ISTb | .   | .  | Host: wcary2p2 |
|      |     | M M |     |      |     |    | Fault Tolerant |

SDMConfig

0 Quit

2 Add Auth Naming Server: LOCAL

3 Change

4 Delete Auth PAM Stack: IEMS

5

6 Next

7 Prev

8

9 List

10 Step

11

12 Up

13 Down

14 Security Servers

15 Configure Authentication Naming Server and PAM Stack.

16 Use the Change to change the settings.

17 Help

18 Refresh Type Next to continue with the next commissioning step, Prev to go back, or List to display a list of available commissioning steps.

Time 00:49 >

### 3.10 OSSGate Interface Changes

Not applicable to this feature.

### 3.11 Security

The feature will change user authentication and authorization for SDM.

#### 3.11.1 Network configuration

n/a

**3.11.2 Key management**

n/a

**3.11.3 Protocol**

n/a

**3.11.4 Authentication**

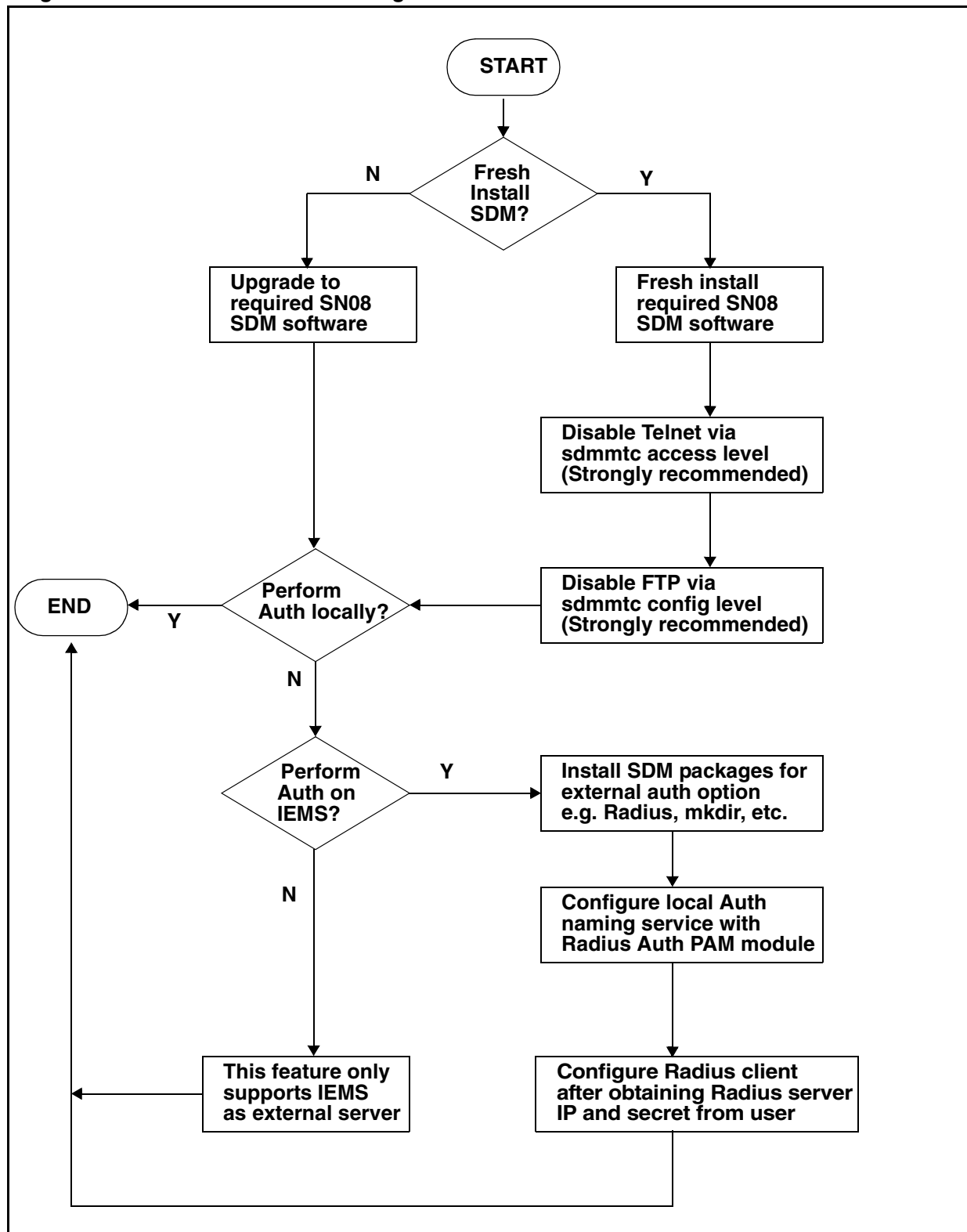
When a SDM is deployed without an external security server, user authentication and authorization will be performed locally on the SDM.

When a SDM is deployed with an external security server like IEMS, user authentication and authorization will be performed through IEMS via Radius protocol.

**3.12 Configuration Walkthrough**

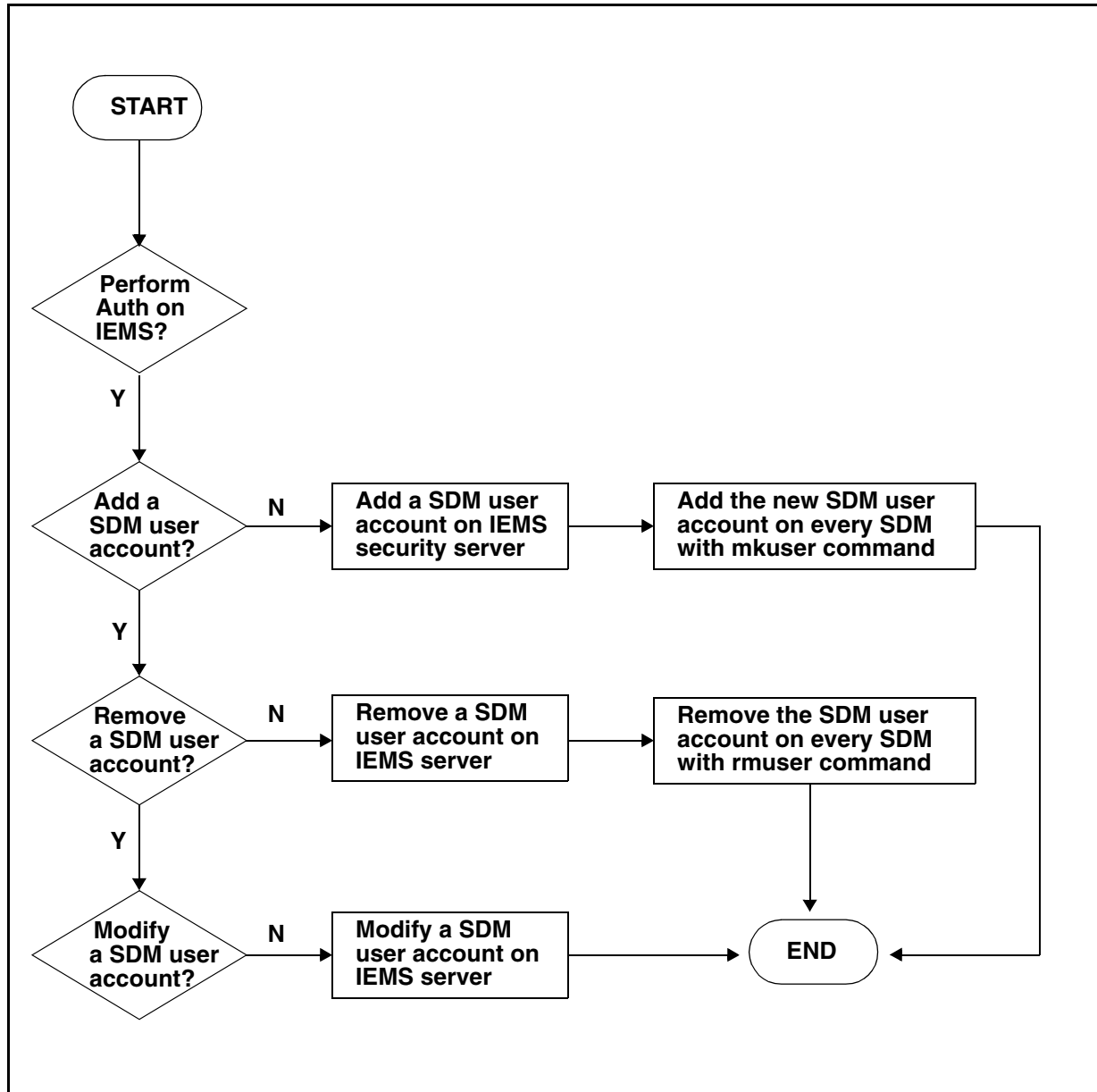
The following figure shows the configuration steps for this feature.

Figure 4 Flow chart for feature configuration

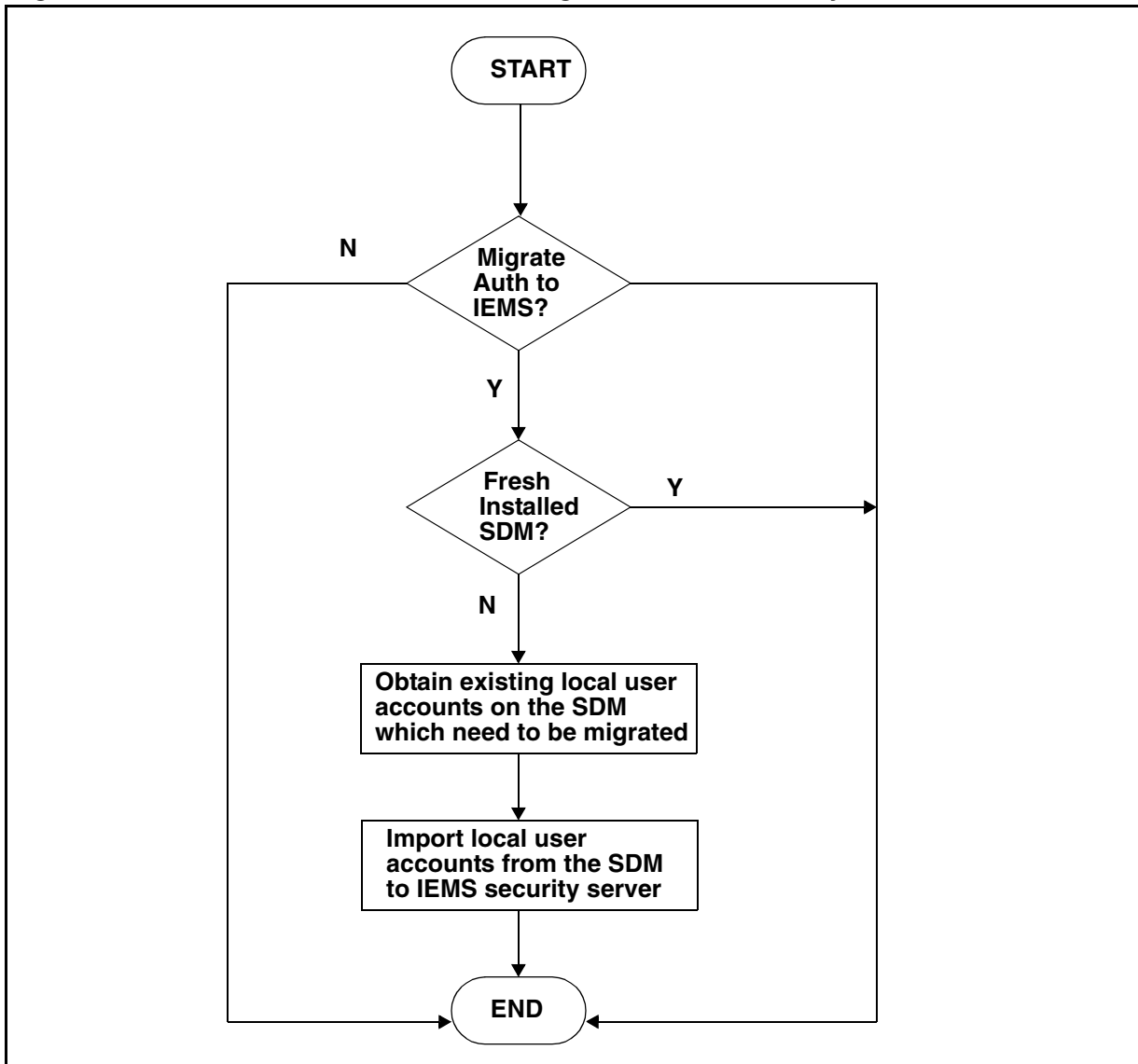


The following figure shows the user account administration steps for this feature when deployed with IEMS as the external security server.

**Figure 5** Flow chart for user account admin with IEMS as security server



The following figure shows the steps for migrating SDM local user accounts on an existing system to the IEMS security server. These steps are needed to support central authentication and authorization.

**Figure 6** Flow chart for local user account migration to IEMS security server

***Product = CS 2000***

**A00007491--SDM File Integrity Audit**  
***Functional Description***

## 1.1 Applicable Solution(s)

DMS, PT-AAL2

## 1.2 Description

This feature monitors the files on the SDM and records file change events to log files. File change events will be logged to one of two log files, auditlog, and securitylog. File changes resulting from regular configuration changes will be recorded in the auditlog file. File changes which are abnormal will be recorded in the securitylog file.

Examples of abnormal file changes would include:

- changes to executable files, not as a result of software delivery
- changes to configuration files, not done by the appropriate SDM configuration tools/commands.
- file changes by the root user.

Changes to files resulting from the application of an authenticated software delivery (patch or fileset) will not result in an audit or security log per file. One audit log will be created indicating the name of authenticated patch or package which was applied.

Each audit or security log will contain the following information:

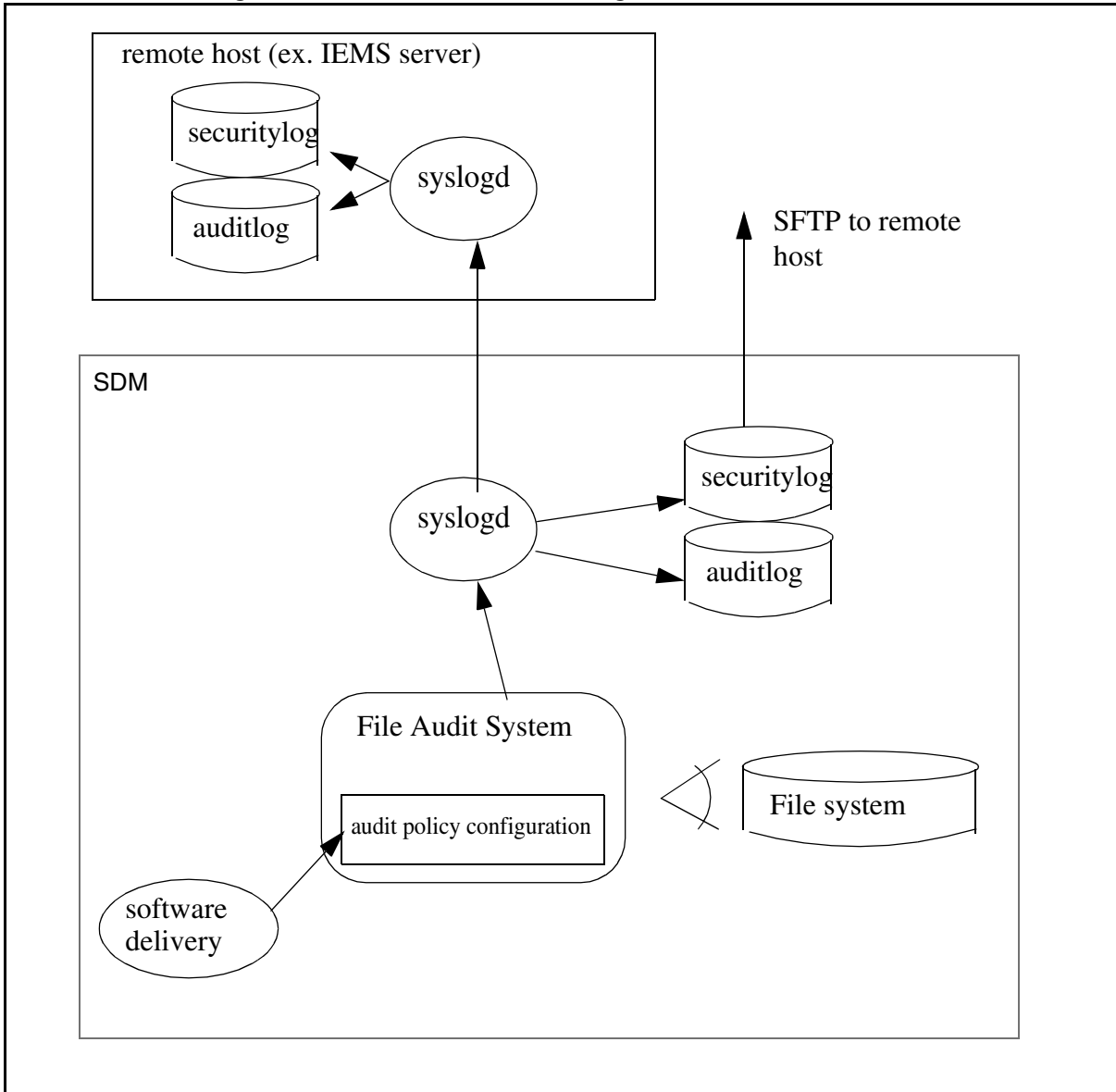
- time of event
- event name (file change)
- login username of the person who changed the file
- complete file name, included the full path

The SDM file audit system utilizes the native AIX audit system, which is a part of the operating system. File change events are detected in real time, not as a result of a periodic comparison.

The audit and security log files will be rotated daily, and kept for one week. The disk storage space for the audit and security logs is monitored, and is alarmed if it exceeds a 70% full threshold. If desired, the files can be securely transferred to a remote host using SFTP (secure file transfer protocol).

In addition to the auditlog and security log files, the logs can also be forwarded in real time to a remote host which supports the UNIX syslog system.



**Figure 1 Functional Behavior Diagram**

### 1.3 Hardware Requirements or Dependencies

None.

### 1.4 Software Requirements or Dependencies

This feature will be distributed in the SN08 release.

## 1.5 Limitations and restrictions

The set files which are monitored are specified in the SDM software load. While this list will be updated as part of software delivery (patch etc.), there is no tool provided to manually update the list of monitored files. It is not expected that the customer will add files to the SDM outside the application of authenticated Nortel software updates. Although it would be possible for a user with security administration privileges to change the audit system configuration by editing a configuration file with “vi”, the practice should not be encouraged.

The mechanism to send audit and security logs to a remote host in real-time (syslogd) does not encrypt the log stream, therefore it cannot be considered secure.

## 1.6 Interactions

This feature does not impact other SDM features.

## 1.7 Applicable customer facing sections

### Fault Management

Logs ☒ X ☐

Alarms ☐ N/A ☐

### Configuration

Data Schema ☐ N/A ☐

User Interface ☒ X ☐

Element Management ☐ N/A ☐

Security ☒ X ☐

Service Order ☐ N/A ☐

Office Parameters ☐ N/A ☐

Accounting (includes AMA billing) ☐ N/A ☐

Performance (includes operational measurements) ☐ N/A ☐

## 1.8 Glossary

| Term   | Description                              |
|--------|------------------------------------------|
| syslog | logging system present on UNIX platforms |

## ***Product = CS 2000***

### **A00007492--SDM User Group Improvements**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS, PT-AAL2

#### **1.2 Description**

A number of SDM maintenance commands require *root* (superuser) privileges. This is a security concern because it results in the wide distribution of the *root* password. This feature will eliminate the requirement to be the *root* user in order to do SDM maintenance procedures<sup>8</sup>, except for procedures which require console access<sup>9</sup>.

Currently there are only two authorization levels on the SDM: 1) the *root* user and 2) users belonging to the *maint* group. In SN08 two new user groups will be created to eliminate the requirement for the *root* user and enable increased authorization granularity. The new groups are **emsadm** for system administration and **secadm** for security administration. While just these two groups will be added in SN08, it will be possible to extend this feature in future releases and add additional groups.

The following table has a general summary of the SDM maintenance functions and the required authorization level.

**Table: 1 Summary of Authorization Levels**

| Function                     | Root | emsadm | secadmin | maint |
|------------------------------|------|--------|----------|-------|
| Initial system installation  | *    |        |          |       |
| Application software install | *    | *      |          |       |
| Application software upgrade | *    | *      | *        | *     |
| System upgrade               | *    |        |          |       |

---

8. Initial installation of an SDM will still require the use of the root account

9. This restriction is documented in the companion feature A00007489. The new user groups are available via ssh access only and are not supported via the console or telnet.

**Table: 1 Summary of Authorization Levels**

| Function                                                            | Root | emsadm | secadmin | maint |
|---------------------------------------------------------------------|------|--------|----------|-------|
| User Administration<br>(create users, add users to groups,<br>etc.) | *    |        | *        |       |
| Application Configuration<br>(effect out of service)                | *    | *      |          |       |
| Application Configuration<br>(no service effect)                    | *    | *      | *        | *     |
| Application State Change                                            | *    | *      | *        | *     |
| Data Access                                                         | *    | *      | *        | *     |
| view security logs                                                  | *    |        | *        |       |
| Backup                                                              | *    | *      | *        | *     |

This feature will extend the SDM maintenance MAP screens for user administration, including additional screens to:

- display list of groups and the users in a group
- display list of users and the groups they belong too
- create / remove users
- add/delete user to group.

**Figure 2 Example Screen: SDM user administration**

```
***      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..   .   ISTb  ISTb  ISTb Host: wcary2p3
          ..                               Fault Tolerant

User
0 Quit
2
3 PassThru  Role Groups          Users
4           maint                joe, bradly,...
5           secadm               Joe, patrick
6           emsadm               bradly, mark, brenda,...
7
8
9
10
11                      Role Groups: 1 to 3 of 3
12 Up
13 Down
14
15
16
17 Help
18 Refresh .
   root
Time 16:28 >
```

**Figure 3 Example Screen: SDM user display**

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb Host: hostname
                        Fault Tolerant
User
0 Quit
2
3 PassThru  Users                Groups
4           Bob                  secadmin
5           Brad                 secadmin, emsadm, maint
6           Brenda               emsadm, maint
7           joe                  maint
8           mark                 maint
9           patrick              maint
10
11                      Users: 1 to 6 of 6
12 Up
13 Down
14
15
16
17 Help
18 Refresh .
  root
Time 16:28 >

```

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level         | Commands | Description                               | Old auth. level | New auth. level |
|----------|---------------|----------|-------------------------------------------|-----------------|-----------------|
| sdmmtc   |               |          |                                           | maint           | maint           |
|          | Mtc           |          | Enter the maintenance level               | maint           | maint           |
|          | Mtc>Con       |          | Enter the SDM connectivity status levels. | maint           | maint           |
|          | Mtc>Con>DS512 |          | Go to the DS512 connectivity level.       | maint           | maint           |
|          | Mtc>Con>DS512 | Logs     | Display the last DS512 event reported.    | maint           | maint           |
|          | Mtc>Con>DS512 | Tst      | Test the service DS512 link(s)            | maint           | maint           |
|          | Mtc>Con>DS512 | Change   | Change DS512 connectivity options         | root            | emsadm          |
|          | Mtc>Con>X25   |          | Go to the X25 connectivity level.         | main            | maint           |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level         | Commands | Description                                                                                   | Old auth. level | New auth. level |
|----------|---------------|----------|-----------------------------------------------------------------------------------------------|-----------------|-----------------|
|          | Mtc>Con>X25   | Logs     | Display the last X.25 event reported                                                          | main            | maint           |
|          | Mtc>Con>X25   | Daemon   | Control X.25 daemon.                                                                          | root            | emsadm          |
|          | Mtc>Con>Eth   |          | Go to the Ethernet connectivity level.                                                        | maint           | maint           |
|          | Mtc>Con>Eth   | Logs     | Display the last event reported on each of the Ethernet connection status indicators.         | maint           | maint           |
|          | Mtc>Con>Eth   | Change   | Change an ethernet interface.                                                                 | root            | emsadm          |
|          | Mtc>Con>Eth   | Add      | Add a new ethernet interface or monitored node.                                               | root            | emsadm          |
|          | Mtc>Con>Eth   | Delete   | Delete an ethernet interface or monitored node.                                               | root            | emsadm          |
|          | Mtc>Con>Eth   | Period   | Display or change the default ping period.                                                    | root            | emsadm          |
|          | Mtc>Con>Eth   | Failures | Display or change the max number of ping failures before the ethernet switches active domain. | root            | emsadm          |
|          | Mtc>Con>Eth   | Timeout  | Display or change the max timeout before ping failure.                                        | root            | emsadm          |
|          | Mtc>Net       |          | Enter the Network connectivity status level.                                                  | maint           | maint           |
|          | Mtc>Net>Core  |          | Go to the Core level.                                                                         | maint           | maint           |
|          | Mtc>Net>Core  | Add      | Add a communication path to the Core.                                                         | root            | emsadm          |
|          | Mtc>Net>Core  | Change   | Change the values for the given communication path to the Core.                               | root            | emsadm          |
|          | Mtc>Net>Core  | Delete   | Delete the given communication path to the Core.                                              | root            | emsadm          |
|          | Mtc>Net>Nodes |          | Go to the Nodes level.                                                                        | maint           | maint           |
|          | Mtc>Net>Nodes | Add      | Add a node.                                                                                   | root            | emsadm          |
|          | Mtc>Net>Nodes | Change   | Change a node.                                                                                | root            | emsadm          |
|          | Mtc>Net>Nodes | Delete   | Delete a node.                                                                                | root            | emsadm          |
|          | Mtc>Net>Nodes | Primary  | Configure the primary node.                                                                   | root            | emsadm          |
|          | Mtc>Net>Nodes | Monitor  | Toggle monitoring of a node.                                                                  | root            | emsadm          |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level           | Commands | Description                                                                            | Old auth. level | New auth. level |
|----------|-----------------|----------|----------------------------------------------------------------------------------------|-----------------|-----------------|
|          | Mtc>Net>DCE     |          | Go to the DCE level.                                                                   | maint           | maint           |
|          | Mtc>Net>DCE     | Add      | Add DCE component(s)                                                                   | root            | emsadm          |
|          | Mtc>Net>DCE     | Delete   | Delete DCE components(s)                                                               | root            | emsadm          |
|          | Mtc>Net>DCE     | Logs     | Display the last DCE event reported (if any).                                          | root            | emsadm          |
|          | Mtc>Net>NTP     |          | Go to the NTP level.                                                                   | maint           | maint           |
|          | Mtc>Net>NTP     | Query    | Display the details of an NTP server.                                                  | maint           | maint           |
|          | Mtc>Net>NTP     | Logs     | Display the last NTP event reported (if any).                                          | maint           | maint           |
|          | Mtc>Net>NTP     | Add      | Add NTP server(s) and peer(s)                                                          | root            | emsadm          |
|          | Mtc>Net>NTP     | Change   | Change NTP server/peer.                                                                | root            | emsadm          |
|          | Mtc>Net>NTP     | Delete   | Delete NTP server(s) and peer(s)                                                       | root            | emsadm          |
|          | Mtc>Appl        |          | Enter the software applications status level.                                          | maint           | maint           |
|          | Mtc>Appl        | logs     | Display the last event reported (if any) on each of the application status indicators. | maint           | maint           |
|          | Mtc>Appl        | Bsy      | Busy an application.                                                                   | maint           | maint           |
|          | Mtc>Appl        | RTS      | Return an application to service.                                                      | maint           | maint           |
|          | Mtc>Appl        | OffL     | Offline an application.                                                                | maint           | maint           |
|          | Mtc>Sys         |          | Enter the operating system software status level.                                      | maint           | maint           |
|          | Mtc>Sys>Storage |          | Enter the STORAGE system status level.                                                 | maint           | maint           |
|          | Mtc>Sys>Storage | ESDAdd   | Add the /swd/sdm/esd logical volume for upgrades from disk.                            | root            | emsadm          |
|          | Mtc>Sys>Storage | ESDDel   | Remove the /swd/sdm/esd logical volume and all its contents.                           | root            | emsadm          |
|          | Mtc>Sys>Storage | Add      | Add new disks to the datavg volume group, OR add a new logical volume.                 | root            | emsadm          |



**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level                | Commands | Description                                                                                                          | Old auth. level | New auth. level |
|----------|----------------------|----------|----------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|
|          | Mtc>Sys>Storage      | Change   | Change the alarm threshold for a system software status indicator, OR expand the size of an existing logical volume. | maint           | maint           |
|          | Mtc>Sys>Backup Clear |          | Clears the Backup Status and alarm.                                                                                  | maint           | maint           |
|          | Mtc>Sys>Audit Clear  |          | Clears the System Audit Status and alarm.                                                                            | maint           | maint           |
|          | Mtc>Hw               |          | Enter the hardware status level.                                                                                     | maint           | maint           |
|          | Mtc>Hw               | logs     | Display the last event reported (if any) on each of the hardware status indicators.                                  | maint           | maint           |
|          | Mtc>Hw               | Bsy      | Busy a hardware device.                                                                                              | maint           | maint           |
|          | Mtc>Hw               | RTS      | Return a hardware device to service.                                                                                 | maint           | maint           |
|          | Mtc>Hw               | Add      | Add a new hardware module to the system.                                                                             | root            | emsadm          |
|          | Mtc>Hw               | Delete   | Delete a hardware module from the system.                                                                            | root            | emsadm          |
|          | Mtc>Hw               | Upgrade  | Upgrade an MFIO.                                                                                                     | root            | emsadm          |
|          | Mtc                  | Quit     | Quit the current level or exit the SDM maintenance interface.                                                        | maint           | maint           |
|          | Mtc                  | Bsy      | Busy the SDM.                                                                                                        | maint           | maint           |
|          | Mtc                  | RTS      | Return the SDM to service.                                                                                           | maint           | maint           |
|          | Mtc                  | OffL     | Offline the SDM.                                                                                                     | maint           | maint           |
|          | Mtc                  | QuerySDM | Query information about the SDM.                                                                                     | maint           | maint           |
|          | Mtc                  | Locate   | Determine location of SDM modules and devices                                                                        | maint           | maint           |
|          | Mtc                  | Help     | Displays help for a single command or all valid                                                                      | maint           | maint           |
|          | Mtc                  | Refresh  | Refresh the current screen.                                                                                          | maint           | maint           |
|          | Admin                |          | Enter the system administration level.                                                                               | maint           | maint           |
|          | Admin>User           |          | Enter the user administration level.                                                                                 | maint           | maint           |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level               | Commands  | Description                                                          | Old auth. level | New auth. level |
|----------|---------------------|-----------|----------------------------------------------------------------------|-----------------|-----------------|
|          | Admin>User>PassThru |           | Go to PassThru level.                                                | maint           | maint           |
|          | Admin>User>PassThru | Change    | Change a PassThru user.                                              | root            | secadm          |
|          | Admin>User>PassThru | Add       | Add a new PassThru user.                                             | root            | secadm          |
|          | Admin>User>PassThru | Delete    | Delete a PassThru user.                                              | root            | secadm          |
|          | Admin>User          | Add       | Add a new maintenance class user id.                                 | root            | secadm          |
|          | Admin>User          | Delete    | Delete a maintenance class user id.                                  | root            | secadm          |
|          | Admin>User          | Change    | Change the password for the user specified.                          | root            | secadm          |
|          | Admin>Backup        |           | Enter the tape backup and restore level.                             | root            | maint           |
|          | Admin>Restore       |           | Begin a full system restore.                                         | root            | root            |
|          | Admin>SWIM          |           | Enter the software inventory management level.                       | maint           | maint           |
|          | Admin>SWIM>Apply    |           | Enter the apply SDM software updates level.                          | root            | emsadm          |
|          | Admin>SWIM>Apply    | Reload    | Reload the list of filesets from the current source.                 | root            | emsadm          |
|          | Admin>SWIM>Apply    | Source    | Choose a source tape drive or directory from which to load filesets. | root            | emsadm          |
|          | Admin>SWIM>Apply    | Eject     | Ejects the tape in the current tape drive or the given tape drive.   | root            | emsadm          |
|          | Admin>SWIM>Apply    | Select    | Selects a fileset.                                                   | root            | emsadm          |
|          | Admin>SWIM>Apply    | Apply     | Apply filesets on this SDM.                                          | root            | emsadm          |
|          | Admin>SWIM>Apply    | Upgrade   | Upgrade all filesets to the latest versions available on the source. | root            | emsadm          |
|          | Admin>SWIM>Apply    | QueryTape | Query the SDM release information from the tape.                     | root            | emsadm          |
|          | Admin>SWIM>Apply    | Search    | Search the list for the given text                                   | root            | emsadm          |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level              | Commands | Description                                                                    | Old auth. level | New auth. level |
|----------|--------------------|----------|--------------------------------------------------------------------------------|-----------------|-----------------|
|          | Admin>SWIM>Apply   | Filter   | Toggle between showing the software description and the software fileset name. | root            | emsadm          |
|          | Admin>SWIM>Apply   | CD:      | Change to the given directory.                                                 | root            | emsadm          |
|          | Admin>SWIM>Apply   | View     | Toggle between showing the software description and the software fileset name. | root            | emsadm          |
|          | Admin>SWIM>Details |          | Enter the software details level.                                              | maint           | maint           |
|          | Admin>SWIM>Details | Select   | Selects a fileset.                                                             | maint           | maint           |
|          | Admin>SWIM>Details | Remove   | Remove software.                                                               | root            | emsadm          |
|          | Admin>SWIM>Details | Search   | Search the list for the given text                                             | maint           | maint           |
|          | Admin>SWIM>Details | Filter   | Filter the list of software.                                                   | maint           | maint           |
|          | Admin>SWIM>Details | View     | Toggle between showing the software description and the software fileset name. | maint           | maint           |
|          | Admin>SWIM>Fixes   |          | Enter the software fixes level.                                                | root            | emsadm          |
|          | Admin>SWIM>Fixes   | Reload   | Reload the list of filesets from the current source.                           | root            | emsadm          |
|          | Admin>SWIM>Fixes   | Source   | Choose a directory from which to load filesets.                                | root            | emsadm          |
|          | Admin>SWIM>Fixes   | Sched    | Set up a scheduled time in which the Fix Auto Apply would execute.             | root            | emsadm          |
|          | Admin>SWIM>Fixes   | Apply    | Apply filesets on this SDM.                                                    | root            | emsadm          |
|          | Admin>SWIM>Fixes   | Filter   | Filter the list of software.                                                   | root            | emsadm          |
|          | Admin>SWIM>Fixes   | View     | Toggle between showing the software description and the software fileset name. | root            | emsadm          |

**Table 2: SDM Command Authorization Summary**

| SDM Tool  | Level                 | Commands | Description                                                                    | Old auth. level | New auth. level |
|-----------|-----------------------|----------|--------------------------------------------------------------------------------|-----------------|-----------------|
|           | Admin>SWIM>Config     |          | Enter the software configuration level.                                        | maint           | maint           |
|           | Admin>SWIM>Config     | Select   | Selects a fileset.                                                             | maint           | maint           |
|           | Admin>SWIM>Config     | Config   | Configure filesets.                                                            | root            | emsadm          |
|           | Admin>SWIM>Config     | Filter   | Filter the list of software.                                                   | maint           | maint           |
|           | Admin>SWIM>Config     | View     | Toggle between showing the software description and the software fileset name. | maint           | maint           |
|           | Admin>SWIM>Options    |          | Enter the options level.                                                       | maint           | maint           |
|           | Admin>SWIM>Options    | Change   | Change default values for SWIM.                                                | root            | emsadm          |
|           | Admin>SWIM>History    |          | Enter the software history level.                                              | maint           | maint           |
|           | Admin>SWIM>History    | ViewLog  | View the log for the given history entry.                                      | maint           | maint           |
|           | Admin>SWIM>Query Tape |          | Select the tape drive you wish to query                                        | maint           | maint           |
|           | Admin>Access          |          | Enter the Telnet access control level.                                         | maint           | maint           |
|           | Admin>Access          | Change   | Change SDM access settings                                                     | root            | emsadm          |
|           | Admin>Time            |          | Display & modify the date and time.                                            | maint/root      | maint           |
|           | Admin>TimeZone        |          | Adjust Daylight Savings Time values.                                           | maint           | maint           |
|           | Admin>TimeZone        | Change   | Change the Time Zone.                                                          | root            | emsadm          |
| sdmconfig | sdmconfig             |          | Enter the system commissioning level.                                          | maint           | maint           |
|           | sdmconfig             | Add      | Add an entry for this commissioning step.                                      | root            | emsadm          |
|           | sdmconfig             | Change   | Change an entry or the commissioned values for the current commissioning step. | root            | emsadm          |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level               | Commands | Description                                    | Old auth. level | New auth. level |
|----------|---------------------|----------|------------------------------------------------|-----------------|-----------------|
|          | sdmconfig           | Delete   | Delete an entry for this commissioning step.   | root            | emsadm          |
|          | sdmconfig           | Step     | Jump to the given commissioning step number.   | maint           | maint           |
|          | sdmconfig           | List     | List all of the available commissioning steps. | maint           | maint           |
|          | sdmconfig           | Next     | Go to the next commissioning step.             | maint           | maint           |
|          | sdmconfig           | Prev     | Go to the previous commissioning step.         | maint           | maint           |
|          | sdmconfig           | Up       | Scroll up through the list.                    | maint           | maint           |
|          | sdmconfig           | Down     | Scroll down through the list.                  | maint           | maint           |
|          | sdmconfig           | LogQuery | Invoke the logquery tool to browse DMS logs.   | maint           | maint           |
| billmtc  |                     |          | Enter billing maintenance level.               | maint           | maint           |
|          | CONFSTRM            |          | Enters CONFSTRM level                          | maint           | maint           |
|          | CONFSTRM            | Add      | Configures a new stream                        | maint           | maint           |
|          | CONFSTRM            | Change   | Changes an existing stream configuration       | maint           | maint           |
|          | CONFSTRM            | Delete   | Deletes a stream                               | maint           | maint           |
|          | CONFSTRM            | List     | Lists configuration of a (or all) stream(s)    | maint           | maint           |
|          | CONFSTRM            | Act      | Activates a filtered stream                    | maint           | maint           |
|          | CONFSTRM            | Deact    | Deactivates a filtered stream                  | maint           | maint           |
|          | CONFSTRM            | Update   | Updates a filtered stream's criteria.          | maint           | maint           |
|          | CONFSTRM            | Start    | Resume receiving records on a filtered stream. | maint           | maint           |
|          | CONFSTRM            | Stop     | Stop receiving records on a filtered stream.   | maint           | maint           |
|          | APPL                |          | Enters the APPL level                          | maint           | maint           |
|          | APPL>AFT            |          | Enters AFT level                               | maint           | maint           |
|          | APPL>AFT>AFT-CONFIG |          | Enters AFT Session configuration level         | maint           | maint           |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level               | Commands | Description                                        | Old auth. level | New auth. level |
|----------|---------------------|----------|----------------------------------------------------|-----------------|-----------------|
|          | APPL>AFT>AFT-CONFIG | Add      | Add AFT tuples to the MIB.                         | maint           | maint           |
|          | APPL>AFT>AFT-CONFIG | Delete   | Delete AFT tuples from the MIB.                    | maint           | maint           |
|          | APPL>AFT>AFT-CONFIG | Change   | Change number of retry attempts for a session.     | maint           | maint           |
|          | APPL>AFT>AFT-CONFIG | List     | List AFT tuples in the MIB.                        | maint           | maint           |
|          | APPL>AFT>           | Query    | Query info on file transfer lists for sessions.    | maint           | maint           |
|          | APPL>AFT>           | Setfile  | Set an override file, delete a file from the list. | maint           | maint           |
|          | APPL>AFT>           | Rsetfile | Reset a file from partial to pending.              | maint           | maint           |
|          | APPL>AFT>           | AFTRESND | Enters AFT resend level                            | maint           | maint           |
|          | APPL>AFT>           | Start    | Start an AFT session that was stopped.             | maint           | maint           |
|          | APPL>AFT>           | Stop     | Stop an AFT session file transfer.                 | maint           | maint           |
|          | APPL>AFT>           | Alarm    | Query or cancel AFT session alarms.                | maint           | maint           |
|          | APPL>AFT>SFP        |          | Enters SFP level                                   | maint           | maint           |
|          | APPL>AFT>SFP        | Query    | Queries the SFP status                             | maint           | maint           |
|          | APPL>AFT>SFP        | Act      | Activates SFP                                      | maint           | maint           |
|          | APPL>AFT>SFP        | Deact    | De-activates SFP                                   | maint           | maint           |
|          | FILESYS             |          | Enters FILESYS level                               | maint           | maint           |
|          | FILESYS             | Sendfile | Sends billing file(s) per stream to downstream     | maint           | maint           |
|          | FILESYS             | Listfile | Lists stored billing file(s) per stream            | maint           | maint           |
|          | FILESYS             | Closec   | Closes currently open billing file(s) per stream   | maint           | maint           |
|          | SCHEDULE            |          | Enters SCHEDULE level                              | maint           | maint           |
|          | SCHEDULE            | Add      | Adds a tuple to the schedule                       | maint           | maint           |
|          | SCHEDULE            | Change   | Changes a tuple in the schedule                    | maint           | maint           |

**Table 2: SDM Command Authorization Summary**

| SDM Tool | Level        | Commands | Description                                    | Old auth. level | New auth. level |
|----------|--------------|----------|------------------------------------------------|-----------------|-----------------|
|          | SCHEDULE     | Delete   | Deletes tuple(s) from the schedule             | maint           | maint           |
|          | SCHEDULE     | List     | Lists tuple(s) in the schedule                 | maint           | maint           |
|          | SCHEDULE>RTB |          | Enters RTB level                               | maint           | maint           |
|          | SCHEDULE>RTB | Rts      | Returns RTB to service for a stream.           | maint           | maint           |
|          | SCHEDULE>RTB | Bsy      | Busies RTB for a stream.                       | maint           | maint           |
|          | SCHEDULE>RTB | Offl     | Offlines RTB for a stream.                     | maint           | maint           |
|          | SCHEDULE>RTB | Query    | Queries the state of RTB for a stream.         | maint           | maint           |
|          | SCHEDULE>RTB | IPTest   | Tests the IP address used by RTB for a stream. | maint           | maint           |
|          | SCHEDULE>RTB | CONFRTB  | Enters the RTB configuration level.            | maint           | maint           |
|          | TOOLS        |          | Enters TOOLS level                             | maint           | maint           |
|          | TOOLS        | Amadump  | Displays record information                    | maint           | maint           |
|          | TAPE         |          | Enters TAPE level                              | maint           | maint           |
|          | TAPE         | Write    | Write billing files to DAT tape                | maint           | maint           |
|          | TAPE         | List     | List billings files on a DAT tape              | maint           | maint           |
|          | TAPE         | Send     | FTP billings files from a DAT tape             | maint           | maint           |
|          | billmtc      | Set      | Sets context                                   | maint           | maint           |
|          | billmtc      | Query    | Displays current state of streams              | maint           | maint           |
|          | billmtc      | Clli     | Displays core CLLI                             | maint           | maint           |
|          | billmtc      | Mib      | Sets and gets MIB objects                      | maint           | maint           |
|          | billmtc      | Dispal   | Displays all current SDM alarms                | maint           | maint           |
|          | billmtc      | Displots | Displays logs not yet sent to CM               | maint           | maint           |

### 1.3 Hardware Requirements or Dependencies

There are no hardware requirements for this feature.

### 1.4 Software Requirements or Dependencies

This feature is dependent on feature A00007489 (IEMS Integration).

## 1.5 Limitations and restrictions

No user interface is provided to create additional authorization levels.

## 1.6 Interactions

This feature will change the RMI for user creation.

## 1.7 Glossary

| Term  | Description                       |
|-------|-----------------------------------|
| CBM   | Core and Billing Manage           |
| IEMS  | Integrated Element Manager System |
| MS    | Management System                 |
| NE    | Network Element                   |
| NE/MS | NE or MS                          |
| RMI   | Resource Manager Interface        |
| SDM   | Super Node Data Manager           |

## 2.1 Configuration for A00007492

## 2.2 Hardware and Software Requirements

## 2.3 Initial Configuration

## 2.4 Office/Subnet parameters (OP/SP) (CM & SESM)

## 2.5 Upgrade Considerations

## 2.6 Data schema (DS) (CM, MIBS, RDB)

## 2.7 Service Orders (SO) (CM & SESM)

## 2.8 Software optionality control (SOC)



## 2.9 Element Management

### 2.10 User interface changes

#### 2.10.1 Directory: <SDM user level>

##### 2.10.1.1 Directory description

The user level of the SDM user interface has been changed. New commands have been added. “Dispusr” enables the operator to display all the users on the system or information about a specific user. “Dispgrp” allows the operator to display all the role groups, the user in a specific role group and the actions that a specific role group can do. The add and change commands of the user interface have also been changed. These commands now prompt the user for each piece of information needed to create a user. The information asked for include primary groups, groups, shell and password.

##### 2.10.1.2 Accessing directory: <sdmmtc; user>

Access to directory or MAP level and return to CI

The user level of the SDMMTC is accessed the same as before.

```
>sdmmtc
```

```
>user
```

#### 2.10.2 Command: <Dispgrp>

##### 2.10.2.1 Command type: < Listed MENU>

##### 2.10.2.2 Command target: <SDM>

##### 2.10.2.3 Command availability: <ALL>

##### 2.10.2.4 Command description

Enables the operator to display all the role groups on the system or the users in a specific user or the activities that a specific role group can perform.

##### 2.10.2.5 Command syntax

Table 1 <CommandName> command parameters and variables

| Command | Parameters and variables |
|---------|--------------------------|
|         |                          |

**Table 1** <CommandName> command parameters and variables

| Command                  | Parameters and variables                                                                                                     |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------|
| dispusr                  | all                                                                                                                          |
|                          | group                                                                                                                        |
|                          | group act                                                                                                                    |
| Parameters and variables | Description                                                                                                                  |
| All                      | Displays all role groups defined on the system. The role group name is displayed along with what users belong to that group. |
| Group                    | Displays the users that belong to the specified group.                                                                       |
| Group Act                | Displays the actions the specified group is allowed to perform.                                                              |

**2.10.2.6 Qualifications and warnings**

Only role groups can be displayed.

**2.10.2.7 Responses****2.10.2.7.1 <errors>****Table 2** MAP outputs with associated meanings and actions

| Command                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dispgrp junk                                                                                                                                                  |
| Cannot execute command. Only Role groups can be displayed.                                                                                                    |
| <b>Meaning:</b> This happens when the group specified is not a role group.                                                                                    |
| <b>System or user actions:</b> User should type a group that is a role group. This command with no parameters or with “all” will display all the role groups. |
| dispusr maint junk                                                                                                                                            |
| Command failed. The third parameter can only be ACT.                                                                                                          |
| <b>Meaning:</b> The third parameter must be the reserved word “ACT”.                                                                                          |
| <b>System or user actions:</b> User should type “act” as the third parameter.                                                                                 |

**Table 2** MAP outputs with associated meanings and actions

| Command                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dispusr junk junk junk                                                                                                                                        |
| DispUsr junk junk - EITHER incorrect optional parameter(s) OR too many parameters.                                                                            |
| <b>Meaning:</b> This happens when too many parameters are given.                                                                                              |
| <b>System or user actions:</b> User should type a group that is a role group. This command with no parameters or with “all” will display all the role groups. |

### 2.10.2.8 Examples

**Figure 1** Example Screen: SDM user dispgrp all

|            |           |                                              |     |      |      |      |                          |
|------------|-----------|----------------------------------------------|-----|------|------|------|--------------------------|
| SDM        | CON       | 512                                          | NET | APPL | SYS  | HW   | CLLI: SNM0               |
| ISTb       | .         | ..                                           | .   | ISTb | ISTb | ISTb | Host: hostname           |
|            | ..        |                                              |     |      |      |      | Fault Tolerant           |
| User       |           |                                              |     |      |      |      |                          |
| 0 Quit     |           |                                              |     |      |      |      |                          |
| 2          |           |                                              |     |      |      |      |                          |
| 3 PassThru | 1 emsadm  | dvsE,bn_ems,dvsE2,dvsE3,bnemsadm,jean        |     |      |      |      |                          |
| 4          | 2 maint   | dvsS3,maint,ftp,anonymou,limaint,dvsM,dvs... |     |      |      |      |                          |
| 5          | 3 secuadm | dvsS2,dvsS3,dvsS,bn_sec,jean                 |     |      |      |      |                          |
| 6          |           |                                              |     |      |      |      | Role Groups: 1 to 3 of 3 |
| 7          |           |                                              |     |      |      |      |                          |
| 8          |           |                                              |     |      |      |      |                          |
| 9          |           |                                              |     |      |      |      |                          |
| 10 Dispgrp |           |                                              |     |      |      |      |                          |
| 11 DispUsr |           |                                              |     |      |      |      |                          |
| 12 Up      |           |                                              |     |      |      |      |                          |
| 13 Down    |           |                                              |     |      |      |      |                          |
| 14         |           |                                              |     |      |      |      |                          |
| 15         |           |                                              |     |      |      |      |                          |
| 16         |           |                                              |     |      |      |      |                          |
| 17 Help    |           |                                              |     |      |      |      |                          |
| 18 Refresh | .         |                                              |     |      |      |      |                          |
| root       |           |                                              |     |      |      |      |                          |
| Time 16:28 |           |                                              |     |      |      |      | >                        |

Figure 2 Example Screen: SDM user display

```
SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb Host: hostname
                               Fault Tolerant
User
0 Quit
2      maint Users
3 PassThru  1 bob
4           2 fred
5           3 maint
6           4 dvsM
7           5 dvsM2
8
9
10 Dispgrp
11 Dispusr
12 Up
13 Down
14
15
16
17 Help
18 Refresh .
  root
Time 16:28 >

Lines: 1 to 5 of 5
```

**Figure 3 Example Screen: SDM user display**

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                               Fault Tolerant
User
0 Quit
2
3 PassThru      Allowed actions for role group secuadm:.
4                security-admin
5                security-manage
6                security-view
7
8
9
10 Dispgrp
11 Dispusr
12 Up
13 Down
14
15
16
17 Help
18 Refresh .
   root
Time 16:28 >

```

Lines: 1 to 3 of 3

**Table 3 Usage examples for DispUsr command**

|                      |                                                                       |
|----------------------|-----------------------------------------------------------------------|
| Description of task: |                                                                       |
| Description of task  | Display all role group                                                |
| Command:             | dispgrp all                                                           |
| MAP response:        | display of all role groups (see figure 3)                             |
| Description of task  | Display a specific role group                                         |
| Command:             | dispgrp maint                                                         |
| MAP response:        | display all the users in the specified group (see figure 4)           |
| Description of task  | Display a specific role group's actions                               |
| Command:             | dispusr secuadm act                                                   |
| MAP response:        | display of the actions the specified group can perform (see figure 5) |

### 2.10.3 Command: <Dispusr>

#### 2.10.3.1 Command type: <NON-MENU, Listed MENU, Unlisted MENU>

#### 2.10.3.2 Command target: <SDM>

#### 2.10.3.3 Command availability: <ALL>

#### 2.10.3.4 Command description

Enables the operator to display all the users on the system or information about a specific user.

#### 2.10.3.5 Command syntax

**Table 4** <CommandName> command parameters and variables

| Command                  | Parameters and variables                                                                                                                           |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| dispusr                  | All<br>User                                                                                                                                        |
| Parameters and variables | Description                                                                                                                                        |
| All                      | Displays all users defined on the system that belong to one of the role groups. The user name is displayed along with what groups it is a part of. |
| User                     | Displays the primary groups, groups, home directory and shell for the user specified.                                                              |

#### 2.10.3.6 Qualifications and warnings

Only users that are a members or a role group may be displayed.

#### 2.10.3.7 Responses

##### 2.10.3.7.1 <errors>

**Table 5** MAP outputs with associated meanings and actions

| Command                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dispusr junk                                                                                                                                                         |
| Command failed. User junk does not exist.                                                                                                                            |
| <b>Meaning:</b> This happens when a user name does not exist                                                                                                         |
| <b>System or user actions:</b> User should type a user that is in a role group. This command with no parameters or with “all” will display all users in role groups. |

**Table 5 MAP outputs with associated meanings and actions**

| Command                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dispusr root                                                                                                                                                         |
| Command failed. User root is not a role group user.                                                                                                                  |
| <b>Meaning:</b> This happens when the user is not in a role group.                                                                                                   |
| <b>System or user actions:</b> User should type a user that is in a role group. This command with no parameters or with “all” will display all users in role groups. |
| dispusr junk junk                                                                                                                                                    |
| DispUsr junk junk - EITHER incorrect optional parameter(s) OR too many parameters.                                                                                   |
| <b>Meaning:</b> This happens when too many parameters are given.                                                                                                     |
| <b>System or user actions:</b> User should type a user that is in a role group. This command with no parameters or with “all” will display all users in role groups. |

### 2.10.3.8 Examples

**Figure 4 Example Screen: SDM user display**

|            |     |     |     |      |      |      |                    |
|------------|-----|-----|-----|------|------|------|--------------------|
| SDM        | CON | 512 | NET | APPL | SYS  | HW   | CLLI: SNM0         |
| ISTb       | .   | ..  | .   | ISTb | ISTb | ISTb | Host: hostname     |
|            | ..  |     |     |      |      |      | Fault Tolerant     |
| User       |     |     |     |      |      |      |                    |
| 0 Quit     |     |     |     |      |      |      |                    |
| 2          |     |     |     |      |      |      |                    |
| 3 PassThru |     |     |     |      |      |      |                    |
| 4          |     |     |     |      |      |      |                    |
| 5          |     |     |     |      |      |      |                    |
| 6          |     |     |     |      |      |      |                    |
| 7          |     |     |     |      |      |      |                    |
| 8          |     |     |     |      |      |      |                    |
| 9          |     |     |     |      |      |      |                    |
| 10 Dispgrp |     |     |     |      |      |      |                    |
| 11 DispUsr |     |     |     |      |      |      | Users: 1 to 6 of 6 |
| 12 Up      |     |     |     |      |      |      |                    |
| 13 Down    |     |     |     |      |      |      |                    |
| 14         |     |     |     |      |      |      |                    |
| 15         |     |     |     |      |      |      |                    |
| 16         |     |     |     |      |      |      |                    |
| 17 Help    |     |     |     |      |      |      |                    |
| 18 Refresh |     |     |     |      |      |      |                    |
| root       |     |     |     |      |      |      |                    |
| Time 16:28 |     |     |     |      |      |      | >                  |

**Figure 5 Example Screen: SDM user display**

|            |               |              |     |             |      |      |                    |
|------------|---------------|--------------|-----|-------------|------|------|--------------------|
| SDM        | CON           | 512          | NET | APPL        | SYS  | HW   | CLLI: SNM0         |
| ISTb       | .             | ..           | .   | ISTb        | ISTb | ISTb | Host: hostname     |
|            | ..            |              |     |             |      |      | Fault Tolerant     |
| User       |               |              |     |             |      |      |                    |
| 0 Quit     |               |              |     |             |      |      |                    |
| 2          |               | <u>maint</u> |     |             |      |      |                    |
| 3 PassThru | <b>pgrp</b>   |              |     | maint       |      |      |                    |
| 4          | <b>groups</b> |              |     |             |      |      |                    |
| 5          |               |              |     | maint       |      |      |                    |
| 6          | <b>home</b>   |              |     | /home/maint |      |      |                    |
| 7          | <b>shell</b>  |              |     | /bin/rash   |      |      |                    |
| 8          |               |              |     |             |      |      | Lines: 1 to 5 of 5 |
| 9          |               |              |     |             |      |      |                    |
| 10 Dispgrp |               |              |     |             |      |      |                    |
| 11 Dispusr |               |              |     |             |      |      |                    |
| 12 Up      |               |              |     |             |      |      |                    |
| 13 Down    |               |              |     |             |      |      |                    |
| 14         |               |              |     |             |      |      |                    |
| 15         |               |              |     |             |      |      |                    |
| 16         |               |              |     |             |      |      |                    |
| 17 Help    |               |              |     |             |      |      |                    |
| 18 Refresh | .             |              |     |             |      |      |                    |
| root       |               |              |     |             |      |      |                    |
| Time 16:28 | >             |              |     |             |      |      |                    |

**Table 6 Usage examples for DispUsr command**

|                      |                                                  |
|----------------------|--------------------------------------------------|
| Description of task: |                                                  |
| Description of task  | Display all role group users                     |
| Command:             | dispusr all                                      |
| MAP response:        | display of all users (see figure 6)              |
| Description of task  | Display a specific role group user               |
| Command:             | dispusr maint                                    |
| MAP response:        | display of the user's information (see figure 7) |



**2.10.4 Command: <Add>****2.10.5 Command type: < Unlisted MENU>****2.10.6 Command target: <SDM>****2.10.7 Command availability: <Secuadm users>****2.10.8 Command description**

Enables the operator to create a new user.

**2.10.8.1 Command syntax****Table 7 <CommandName> command parameters and variables**

| Command                  | Parameters and variables                                                                                                                                 |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| add                      | User                                                                                                                                                     |
| Parameters and variables | Description                                                                                                                                              |
| User                     | Add a user with the name that was specified.                                                                                                             |
| Pgrp                     | Set the primary group to the value specified. Allowed values are maint, emsadm or secuadm.                                                               |
| Groups                   | Add the group list for this user. Allowed values are maint, emsadm and secuadm. One or more groups may be added. List them separated by blanks or commas |
| Shell                    | Set the shell of the user. Allowed values are rash for a restricted shell, fash for a full shell and nash for no shell.                                  |
| password                 | Set the password for the user.                                                                                                                           |

**2.10.8.2 Qualifications and warnings**

None.

### 2.10.8.3 Responses

#### 2.10.8.3.1 <errors>

**Table 8** MAP outputs with associated meanings and actions

| Command                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>add maint</p> <p>Command failed. User 'maint' already exists.</p> <p><b>Meaning:</b> This happens when a user name is already in use</p> <p><b>System or user actions:</b> User should type a different name</p>                                                                                                                                                 |
| <p>add toobigname</p> <p>Cannot execute command. USERID cannot exceed 8 characters.</p> <p><b>Meaning:</b> This happens when the user name is greater than 8 characters.</p> <p><b>System or user actions:</b> User should type a user name less than or equal to 8 characters long.</p>                                                                            |
| <p>add</p> <p>or</p> <p>add junk junk</p> <p>EITHER incorrect optional parameter(s) OR too many parameters.</p> <p><b>Meaning:</b> This happens when too many or not enough parameters are given.</p> <p><b>System or user actions:</b> User should type a user name.</p>                                                                                           |
| <p>add User - Primary Group</p> <p>Enter the new Primary Group for user bn_ems: [maint]</p> <p>&gt;junk</p> <p>Group 'junk' is not a Role Group.</p> <p><b>Meaning:</b> This happens when a non role group is entered</p> <p><b>System or user actions:</b> User should type a valid role group (maint, emsadm or secuadm) or type enter to accept the default.</p> |

**Table 8 MAP outputs with associated meanings and actions**

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>add User - Groups</p> <p>Enter the new Group List for user bn_ems: [maint]</p> <p>&gt;junk</p> <p>Group 'junk' is not a Role Group.</p> <p>Type list of role groups separated by commas.</p> <p><b>Meaning:</b> This happens when a non role group is entered</p> <p><b>System or user actions:</b> User should type a valid role group (maint, emsadm or secuadm) or type enter to accept the default.</p> <p>add User - Shell</p> <p>Enter the new Shell for user bn_ems: [rash]</p> <p>&gt;junk</p> <p>'junk' is not a valid shell.</p> <p>Allowed values are 'rash', 'fash' or 'nash'.</p> <p><b>Meaning:</b> This happens when a non-valid shell is typed.</p> <p><b>System or user actions:</b> User should type a valid shell (rash, fash or nash) or type enter to accept the default.</p> <p>add User - Change Password?</p> <p>Do you wish to change the password for user bn_ems?</p> <p>Please confirm ("YES", "Y", "NO", or "N"):</p> <p>&gt;jmaybe</p> <p>Invalid input: Please try again.</p> <p><b>Meaning:</b> Allowed answers are yes or no.</p> <p><b>System or user actions:</b> User must reply yes or no.</p> |

## 2.10.8.4 Examples

Figure 6 Example Screen: SDM user display

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..   .    ISTb  ISTb  ISTb  Host: hostname
                        Fault Tolerant
User
0 Quit
2          Role Group  Users
3 PassThru  1 emsadm  bn_ems
4           2 maint   maint,ftp,anonymou,limaint
5           3 secuadm No users defined in this group
6                                Role Groups: 1 to 3 of 3
7
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16
17 Help    Add User - Primary Group
18 Refresh Enter the new Primary Group for user bn_sec: [maint]
root
Time 16:28 >

```

Figure 7 Example Screen: SDM user display

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                               Fault Tolerant
User
0 Quit
2
3 PassThru  Role Group  Users
4           1 emsadm  bn_ems
5           2 maint   maint,ftp,anonymou,limaint
6           3 secuadm No users defined in this group
7                               Role Groups: 1 to 3 of 3
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16
17 Help    Add User - Groups
18 Refresh Enter the new Group List for user bn_sec: [maint]
root
Time 16:28 >

```

Figure 8 Example Screen: SDM user display

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                               Fault Tolerant
User
0 Quit
2
3 PassThru   Role Group  Users
4             1 emsadm   bn_ems
5             2 maint    maint,ftp,anonymou,limaint
6             3 secuadm  No users defined in this group
7                                     Role Groups: 1 to 3 of 3
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16
17 Help      Add User - Shell
18 Refresh   Enter the new Shell for user bn_sec: [rash]
            root
Time 16:28 >

```

**Figure 9 Example Screen: SDM user display**

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                               Fault Tolerant
User
0 Quit
2          Role Group  Users
3 PassThru  1 emsadm  bn_ems
4           2 maint   maint,ftp,anonymou,limaint
5           3 secuadm No users defined in this group
6                               Role Groups: 1 to 3 of 3
7
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16          Add User - Change Password?
17 Help      Do you wish to change the password for user bn_sec?
18 Refresh   Please confirm ("YES", "Y", "NO", or "N"):
root
Time 16:28 >

```

**2.10.9 Command: <Change>****2.10.9.1 Command type: < Unlisted MENU>****2.10.9.2 Command target: <SDM>****2.10.9.3 Command availability: <Secuadm users>****2.10.9.4 Command description**

Enables the operator to change an existing user.

**2.10.9.5 Command syntax****Table 9 <CommandName> command parameters and variables**

| Command                  | Parameters and variables |
|--------------------------|--------------------------|
| Change                   | User                     |
| Parameters and variables | Description              |

**Table 9** <CommandName> command parameters and variables

| Command  | Parameters and variables                                                                                                                                    |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| User     | change a user with the name that was specified.                                                                                                             |
| Pgrp     | change the primary group to the value specified. Allowed values are maint, emsadm or secuadm.                                                               |
| Groups   | change the group list for this user. Allowed values are maint, emsadm and secuadm. One or more groups may be added. List them separated by blanks or commas |
| Shell    | change the shell of the user. Allowed values are rash for a restricted shell, fash for a full shell and nash for no shell.                                  |
| password | Change the password for the user.                                                                                                                           |

**2.10.9.6 Qualifications and warnings**

None.

**2.10.9.7 Responses****2.10.9.7.1 <errors>****Table 10** MAP outputs with associated meanings and actions

| Command                                                                                              |
|------------------------------------------------------------------------------------------------------|
| change junk                                                                                          |
| Command failed. 3004-687 User "junk" does not exist.                                                 |
| <b>Meaning:</b> This happens when a user name does not exist.                                        |
| <b>System or user actions:</b> User should type a user that already has been created.                |
| change toobigname                                                                                    |
| Cannot execute command. USERID cannot exceed 8 characters.                                           |
| <b>Meaning:</b> This happens when the user name is greater than 8 characters.                        |
| <b>System or user actions:</b> User should type a user name less than or equal to 8 characters long. |
| change junk junk                                                                                     |
| EITHER incorrect optional parameter(s) OR too many parameters.                                       |
| <b>Meaning:</b> This happens when too many or not enough parameters are given.                       |
| <b>System or user actions:</b> User should type a user name.                                         |



**Table 10** MAP outputs with associated meanings and actions

| Command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>change User - Primary Group</p> <p>Enter the new Primary Group for user bn_ems: [maint]</p> <p>&gt;junk</p> <p>Group 'junk' is not a Role Group.</p> <p><b>Meaning:</b> This happens when a non role group is entered</p> <p><b>System or user actions:</b> User should type a valid role group (maint, emsadm or secuadm) or type enter to accept the default.</p> <p>change User - Groups</p> <p>Enter the new Group List for user bn_ems: [maint]</p> <p>&gt;junk</p> <p>Group 'junk' is not a Role Group.</p> <p>Type list of role groups separated by commas.</p> <p><b>Meaning:</b> This happens when a non role group is entered</p> <p><b>System or user actions:</b> User should type a valid role group (maint, emsadm or secuadm) or type enter to accept the default.</p> <p>change User - Shell</p> <p>Enter the new Shell for user bn_ems: [rash]</p> <p>&gt;junk</p> <p>'junk' is not a valid shell.</p> <p>Allowed values are 'rash', 'fash' or 'nash'.</p> <p><b>Meaning:</b> This happens when a non-valid shell is typed.</p> <p><b>System or user actions:</b> User should type a valid shell (rash, fash or nash) or type enter to accept the default.</p> |

**Table 10** MAP outputs with associated meanings and actions

| Command                                                   |
|-----------------------------------------------------------|
| change User - Change Password?                            |
| Do you wish to change the password for user bn_ems?       |
| Please confirm ("YES", "Y", "NO", or "N"):                |
| >jmaybe                                                   |
| Invalid input: Please try again.                          |
| <b>Meaning:</b> Allowed answers are yes or no.            |
| <b>System or user actions:</b> User must reply yes or no. |

### 2.10.9.8 Examples

**Figure 10** Example Screen: SDM user display

|            |     |     |     |      |      |      |                |
|------------|-----|-----|-----|------|------|------|----------------|
| SDM        | CON | 512 | NET | APPL | SYS  | HW   | CLLI: SNM0     |
| ISTb       | .   | ..  | .   | ISTb | ISTb | ISTb | Host: hostname |
|            | ..  |     |     |      |      |      | Fault Tolerant |
| User       |     |     |     |      |      |      |                |
| 0 Quit     |     |     |     |      |      |      |                |
| 2          |     |     |     |      |      |      |                |
| 3 PassThru |     |     |     |      |      |      |                |
| 4          |     |     |     |      |      |      |                |
| 5          |     |     |     |      |      |      |                |
| 6          |     |     |     |      |      |      |                |
| 7          |     |     |     |      |      |      |                |
| 8          |     |     |     |      |      |      |                |
| 9          |     |     |     |      |      |      |                |
| 10 Dispgrp |     |     |     |      |      |      |                |
| 11 DispUsr |     |     |     |      |      |      |                |
| 12 Up      |     |     |     |      |      |      |                |
| 13 Down    |     |     |     |      |      |      |                |
| 14         |     |     |     |      |      |      |                |
| 15         |     |     |     |      |      |      |                |
| 16         |     |     |     |      |      |      |                |
| 17 Help    |     |     |     |      |      |      |                |
| 18 Refresh |     |     |     |      |      |      |                |
| root       |     |     |     |      |      |      |                |
| Time 16:28 |     |     |     |      |      |      |                |
| >          |     |     |     |      |      |      |                |

Figure 11 Example Screen: SDM user display

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                        Fault Tolerant
User
0 Quit
2
3 PassThru  Role Group  Users
4           1 emsadm   bn_ems
5           2 maint    maint,ftp,anonymou,limaint
6           3 secuadm  No users defined in this group
7                                     Role Groups: 1 to 3 of 3
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16
17 Help     Change User - Groups
18 Refresh  Enter the new Group List for user bn_sec: [maint]
root
Time 16:28 >

```

Figure 12 Example Screen: SDM user display

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                               Fault Tolerant
User
0 Quit
2
3 PassThru   Role Group  Users
               1 emsadm bn_ems
4               2 maint  maint,ftp,anonymou,limaint
5               3 secuadm No users defined in this group
6                               Role Groups: 1 to 3 of 3
7
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16
17 Help      Change User - Shell
18 Refresh   Enter the new Shell for user bn_sec: [rash]
             root
Time 16:28 >

```

Figure 13 Example Screen: SDM user display

```

SDM      CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb     .    ..    .    ISTb  ISTb  ISTb  Host: hostname
                               Fault Tolerant
User
0 Quit
2
3 PassThru  Role Group  Users
                1 emsadm  bn_ems
4                2 maint  maint,ftp,anonymou,limaint
5                3 secuadm No users defined in this group
6                                Role Groups: 1 to 3 of 3
7
8
9
10 Dispgrp
11 DispUsr
12 Up
13 Down
14
15
16          Add User - Change Password?
17 Help      Do you wish to change the password for user bn_sec?
18 Refresh   Please confirm ("YES", "Y", "NO", or "N"):
root
Time 16:28 >

```

Change can also be typed with no parameters. In this case the command can be run by any user and the user is only allowed to change their own password.

## 2.11 OSSGate Interface Changes

## 2.12 Security

## 2.13 Configuration Walkthrough

*Product = CS 2000*

**A00007548--SN08 Packet Cable Electronic Surveillance**

## ***Functional Description***

### **1.1 Applicable Solution(s)**

IAC

### **1.2 Description**

#### **1.2.1 Background**

CableLabs is a consortium of cable operators and cable equipment vendors that creates specifications for cable access VoIP. CableLabs' PacketCable project promotes vendor inter-operability. In order to provide a billing capability, PacketCable has defined a specification for an event reporting mechanism that called "PacketCable Event Messaging" (PCEM). PCEM uses RADIUS accounting (RFC 2866) to deliver event messages to a record keeping server (RKS). Activity A00007196 (Packet Cable Event Messaging For Accounting SN08) provides an implementation of PCEM for the Succession Cable Solution.

PacketCable has also defined a specification for a lawful interception mechanism called "PacketCable Electronic Surveillance" (PCES). PCES and PCEM use an overlapping set of event messages, and use Radius accounting to send event messages.

*This* feature delivers a PacketCable-compliant Lawful Interception solution for the Call Server 2000 (CS2K) Cable VoIP Solution. It implements PacketCable surveillances, which consist of Call Data and if required Call Content for monitored calls.

This development activity is one component of Nortel's development effort to support "Packet Cable 1.5" compliance in the Succession Cable Solution.

This activity provides CMS PacketCable 1.5 compliance with PCES for PacketCable. Specifically for the Lawful Interception component of event messaging CableLabs specification PKT-SP-EM-I10. The interface to the LEA is provided by the third-party DF component (as described below). The DF must be compliant to PacketCable specification PKT-SP-ESP-I03-040113.

#### **1.2.2 Electronic Surveillance Implementation**

Figure 1 illustrates PCES with respect to the components of the CS2k PacketCable solution. For PCES events which are detected by the CS2K, event notifications are sent to the Event Message Delivery Interface (EMDI), which sends PCES Event Messages (PCES EMs) to the DF, which in turn multicasts it to the LEA collection functions as required.

The CMTS sends PCES event messages directly to the DF. Call Content is sent directly to the DF by the Trunk GW and CMTS.

The EMDI (Event Messaging Delivery Interface) encapsulates the capability of formatting event messages with RADIUS headers and sending to the RKS (including retries). For this activity, the EMDI is provided by the IAA (Integrated Accounting Application) on the CBM. The IAA may also receive event messages from the GWC for ES (Electronic Surveillance).

The DF (Delivery Function) is third-party equipment provided by any DF vendor. The DF receives event messages from the EMDI, the CMTS, and the trunk gateway.

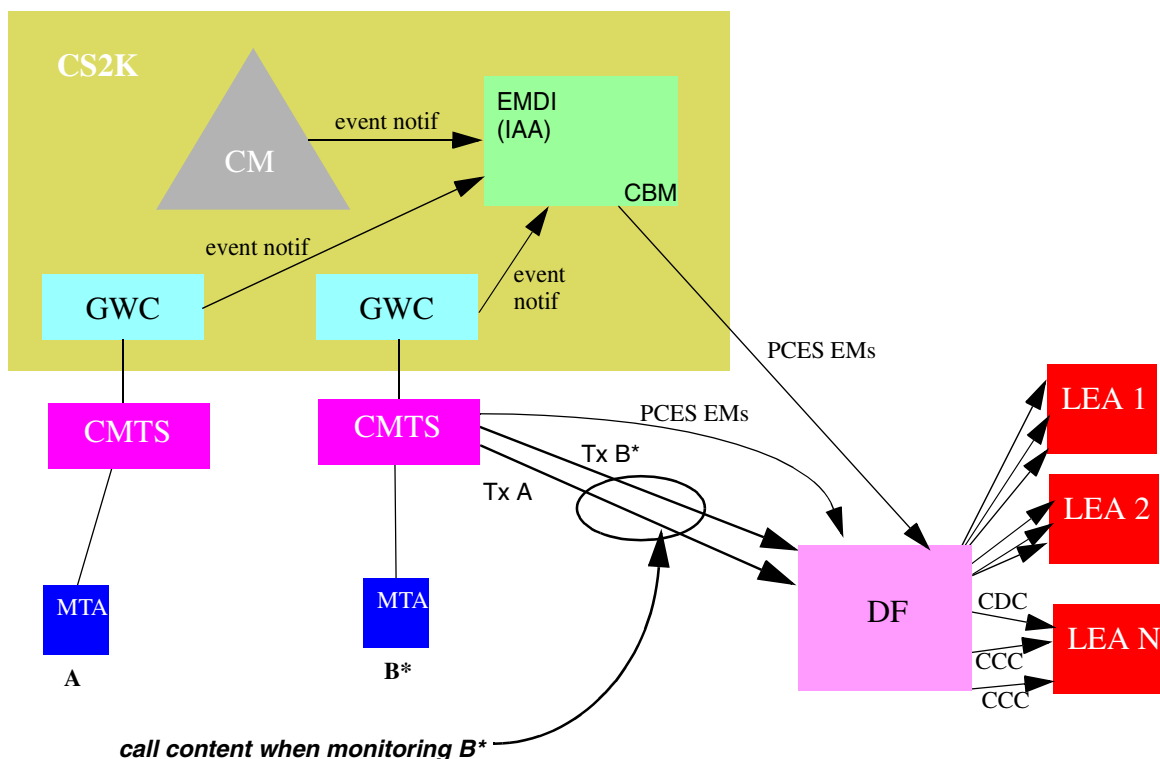
The PacketCable architecture refers to two network elements that are not labeled in Figure 1: the CMS and the MGC. The CMS, or call management server, is PacketCable's line solution. Nortel implements the CMS by using functionality in the CM and small-lines GWCs. The MGC, or media gateway controller (not to be confused with our GWC), is PacketCable's trunk solution. Nortel implements the MGC using the CM and trunk GWCs controlling TGCP trunk gateways.

USNBD is an existing CS2K Cable Solution lawful interception feature. PCES shares much functionality with USNBD, and in order to avoid duplication, the reader is referred to the USNBD NTPs for a description of certain functionality.

**Table 1 Existing USNBD documentation**

| Number      | Title                                                                 |
|-------------|-----------------------------------------------------------------------|
| NN10264-709 | Lawful Intercept                                                      |
| NN10190-113 | Succession Performance Management: Operational Measurements Reference |
| NN10345-501 | Configuration Management: Lawful Intercept Service                    |
| NN10300-100 | IP Solutions Basics                                                   |
| NN10188-511 | Communication Server 2000 Configuration Management                    |

PCES has some common functionality with USNBD, and the existing USNBD documentation may be useful. ("Table 1 Existing USNBD documentation") PCES can not be used in the CM concurrently with USNBD, so the logs apply to the surveillance feature which is currently active in the CS2K. In order to avoid duplication, the reader is referred to the USNBD NTPs for a description of these logs.

**Figure 1 PCES Architecture – subject monitoring**

## 1.3 PCES call monitoring

### 1.3.1 Event Messages (call data)

Event Messages (PCES EMs) are generated at different points in the call and they contain information which can be used for surveillance purposes and for the purpose of interpreting call content. For example: a signaling\_start event message contains the calling and called DNs.

Event messages are generated for each half call. Therefore, separate event messages are generated for the originating and terminating call halves.

#### 1.3.1.1 Message Structure

Refer to the Packet Cable specification PKT-SP-EM-I10 for details regarding the individual components in the Packet Cable event messages.



### 1.3.1.2 Message Types

**Table 2 PacketCable Event Messages**

| Name                                                                      | Description                                                                                                            |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Signaling_Start                                                           | Start of signaling for originating or terminating half of the call                                                     |
| Signaling_Stop                                                            | End of signaling for originating or terminating half of the call                                                       |
| Database_Query                                                            | An inquiry into an external database; for example 800, LNP                                                             |
| QoS_Reserve*                                                              | Reservation of QoS bandwidth for originating or terminating half of the call                                           |
| QoS_Commit*                                                               | Commitment of QoS bandwidth for originating or terminating half of the call                                            |
| QoS_Release*                                                              | Release of QoS bandwidth for originating or terminating half of the call                                               |
| Service_Activation                                                        | Indicates a subscriber has activated a service                                                                         |
| Service_Instance                                                          | Indicates an occurrence of a service                                                                                   |
| Service_Deactivation                                                      | Indicates a subscriber has deactivated a service                                                                       |
| Call_Answer                                                               | Indicates that all network resources have been allocated for originating or terminating half of the call               |
| Media_Alive                                                               | Indicates if the call is still active (Not supported in SN08)                                                          |
| Call_Disconnect                                                           | Indicates that all network resources have been released for originating or terminating half of the call                |
| Media_Report                                                              | Indicates a change in media session information. (PCES only)                                                           |
| Signal_Instance                                                           | Indicates an NCS signal sent from the subject or from the network. (PCES only)                                         |
| Interconnect_Start                                                        | Start of network interconnect signaling (between PacketCable and PSTN) for originating or terminating half of the call |
| Interconnect_Stop                                                         | Stop of network interconnect signaling (between PacketCable and PSTN) for originating or terminating part of the call  |
| Time_Change                                                               | Indicates time change on a network element.                                                                            |
| *QOS_XXXX messages are generated by the CMTS and sent directly to the DF. |                                                                                                                        |

### 1.3.2 Call Content

When a surveillance requires call content, the transmit of both agents in the connection is provided to Law Enforcement.

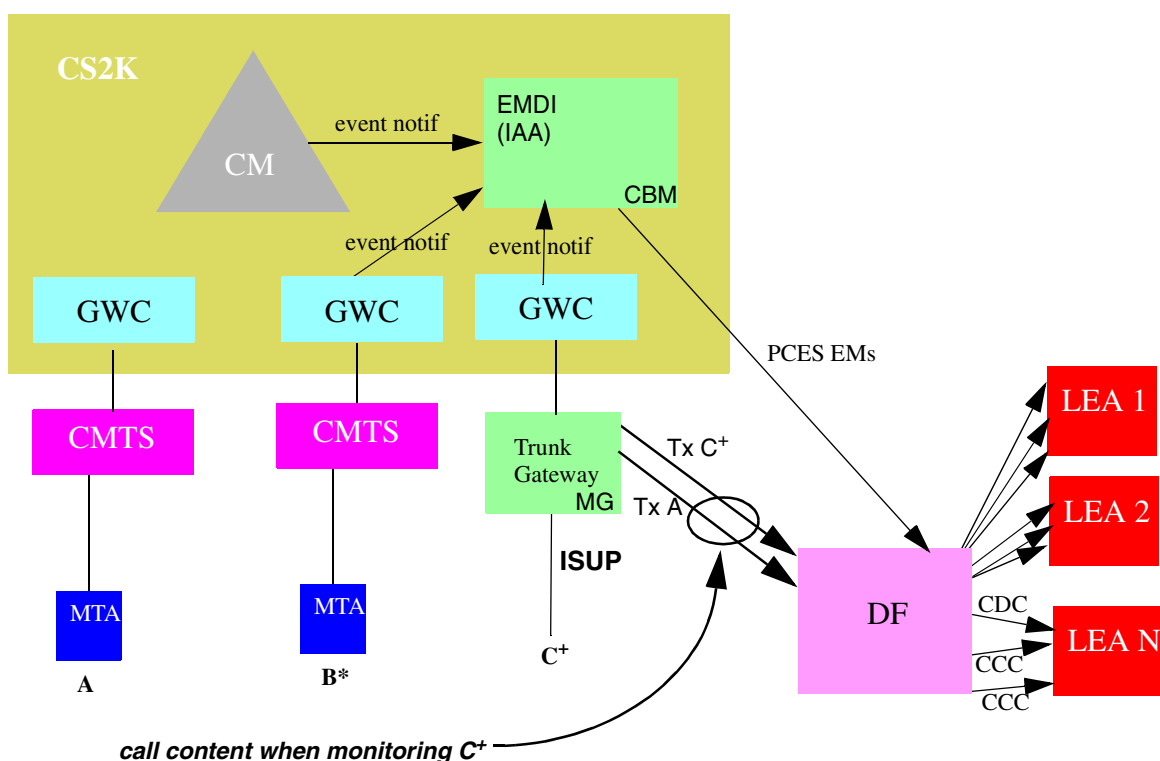
The call content (for both parties) is sent directly from the CMTS or MG to the DF. That is, if the subject B\*, hosted on a CMTS, is talking to associate A, the

transmit paths of both the subject  $B^*$  and associate A are sent directly from the CMTS hosting  $B^*$  to the DF (as shown in Figure 1).

If the subject redirects a call on-net, the call content IAP will be the CMTS of the redirected-to party.

On the other hand, if the call is redirected by the subject to the PSTN and the replacement party (or *observed party*) is  $C^+$ , hosted on a trunk MG, the content (or transmit paths) for  $C^+$  and the associate (A) are sent directly from the MG to the DF. This only occurs when a call is redirected by the subject to the PSTN, so neither  $C^+$  nor A is an actual subject.  $C^+$  is a *monitored replacement party*, or MRP.<sup>10</sup> Figure 2 illustrates the case where A calls subject  $B^*$  who forwards the call off-net to  $C^+$ , and the call content IAP is at the trunk MG.

**Figure 2 PCES Architecture – MRP monitoring (subject redirects off-net)**



Since content multicasting to multiple LEAs is done by the DF, PCES will provide a single call content stream if there is at least one PCES surveillance on an agent in a connection which requires call content.

10. A Monitored Replacement Party (MRP) is a party which replaces the subject through a redirection feature controlled by the subject. This could be caused by F calling subject  $A^*$ , and  $A^*$  either forwarding or transferring the call to C, which routes through the MG to the PSTN.

### 1.3.3 Multiple surveillances on a connection

PCES provides call content for a single agent in a connection. If a subject redirects a call to another subject, the resulting call will be monitored for only a single subject. The DF provides multicasting of the content and data to the appropriate LEA Collection Functions.

Consider the following example: Associate A calls subject B\* which has call forwarding to subject C\*. The resulting call is A – C<sup>+</sup>, where C<sup>+</sup> is the terminating party.

If either B or C is subject to a call content surveillance, the resulting call will be monitored for content, regardless whether the other surveillance was data-only. Since at least one surveillance requires call content, the resulting call will be monitored for call content.

It is possible to configure a CS2K to support multiple DFs, and it is also possible to provision different surveillances to use different DFs. If B\* and C\* have surveillances provisioned to use different DFs, the resulting A – C<sup>+</sup> call will be monitored to use C's DF.

In the future PacketCable architecture may require DFs to communicate with each other so that the surveillance data can be multicast by the DF not only to LEA Collection Functions, but also to other DFs (for example, B's). In the current release of the PacketCable architecture, the mechanisms to permit inter-DF communication are not yet specified. Therefore, it is recommended that only a single DF be provisioned for all surveillances on a CS2K.

If multiple DFs are configured on a CS2K, for purposes of redundancy, it is recommended that only one DF be used at any given time, and all surveillances be provisioned to use it.

## 1.4 Configuration

PCES requires PCEM to be configured and active, as described in the documentation for activity A00007196 (PacketCable Event Messaging for SN08). However, where PCEM requires an RKS to receive accounting event messages and forward them to billing systems, PCES requires a DF to Electronic Surveillance event messages and call content, and to forward them to LEA Collection Functions (CFs).

In addition to the PCEM configuration, PCES also requires

### 1.4.0.1 Add DF tuple entries

PCES requires one or more DFs to be provisioned on the CM.

```
> table pcementt
> add DF <df_index> DF <CDC_IP> <CDC_PORT> <CCC_IP> <CCC_PORT>
  <ASSOC_EMDI>
```

For example, to provision a DF using CDC address and port 47.135.41.107:4000, and CCC address and port 47.135.41.107:5000

```
> add DF 3    DF 47 135 41 107 4000 47 135 41 107 5000 0
```

In this example 0 is the index in Table PCEMENTT of the record for the EMDI which will be used to send the event messages to the DF.

## 1.5 Hardware requirements

The PCES solution requires a PacketCable 1.1 certified network (CMTS, Trunk GW, DF, MTAs).

## 1.6 Limitations and restrictions

There is no support for PCES and USNBD interworking. USNBD is a CS2K Lawful Interception application.

Either USNBD is the active LI application or PCES is the active LI application. Both cannot be active at the same time.

A maximum of 5 surveillances may be provisioned against a subject. However only a single surveillance can be activate on a subject at any time.

When there is a change to the Line Class Code (LCC) of a DN (*e.g.*, from POTS to RES or *vice versa*), if that DN is the subject of an active surveillance, the surveillance will be deleted. An inactive surveillance will not be deleted.

PCES surveillance will fail if the DF is either not in service or not properly configured on the CS2K.

DOCSIS requires that connections between two endpoints having the same IP address (and hence hosted on the same MTA) must not be routed to the CMTS. Therefore PCES does not provide call content for a connection between two lines on the same MTA. This due to the fact that the voice stream for intra-MTA calls is locally routed and does not pass through the CMTS (the call content IAP).

## 1.7 Dependencies

The SOC state of USNBD must be set to ON for PCES SOC to be assigned state ON.

PacketCable Event Messaging (PEM) must be active on the switch.

## 1.8 Logs (LG)

All the UNB 300 logs are generated by PCES as they are by USNBD, with the exception of UNB301 (CDC), UNB303 (CCR), and UNB306, which are not generated by PCES. Access to UNB logs is only provided to PCES users through LOGUTIL's OPENSECRET command (no password is required).

LOGUTIL  
OPENSECRET UNB

USNBD log reports

- UNB300 - Reports problems with USNBD shared resources used by PCES
- UNB302 - Reports problems with USNBD processes used by PCES
- UNB304 - reports success and failure of surveillance activation and deactivation, and problems with surveillance activation.

The following is a sample surveillance activation log generated when a surveillance is activated.

```
COMIT_I07CU    UNB304 AUG20 14:15:53 3300 INFO
SURV ACT COMMAND SUCCESSFULLY PROCESSED
SURVEILLANCE HAS BEEN ACTIVATED
SIN: NYPD654
COMMAND ENTERED BY: USERJOE
```

When the line class code of a line changes, an active surveillance on the line will be removed. A UNB304 log will be generated as follows:

```
COMIT_I08AV    UNB304 NOV02 15:20:52 5100 INFO
SUBJECT HAS BEEN DELETED
SURVEILLANCE HAS BEEN DELETED
SIN: 9194303602
AGENCY:
SURV. DEFN.: DN 9194303602 9194303602 N Y N
```

- UNB305- reports problems that affect PCES administration data and reports all user creations and deletions
- UNB306 - Not used by PCES

## 1.9 Operational Measurements (OM)

Lawful Intercept OMs for group UNBCDC are not used by PCES.

Lawful Intercept OMs for group UNBMISC are used by PCES.

RELCPCY - Register RELCPCTY counts the number of monitored calls for which monitoring was stopped because monitoring capacity is exceeded.

RELNMON - Register RELNMON counts the number of calls for which monitoring was stopped because of non-monitorable features. **All features supported by the CS2K PacketCable solution are monitorable.**

UNBMCALL - Register UNBMCALL counts the number of calls monitored by USNBD. Register UNBMCALL determines the real-time impact monitored calls make on the CM.

## **1.10 Some differences between PCES and USNBD**

### **1.10.1 Performance management**

PCES differs from USNBD functionality described in NN10264-709 (I)SN07 Preliminary 01.01 September, 2004 Succession Performance Management Operational Measurements Reference.

The USNBD feature uses the registers in OM group CF3P to monitor usage of 3-way conference bridges used for combined call content resources (Combined CCRs). As PCES does not provide combined call content, this OM group is never incremented by PCES.

### **1.10.2 Private Network Interception**

USNBD can be configured to provide Private Network Interception, as described in NN10190-113 (Lawful Intercept). PCES cannot be configured to provide call content for connections which reside behind a private NAT.

### **1.10.3 User classes**

USNBD distinguishes between Regular users and Administrative users, who in addition to all Regular operations have the privilege to add and delete USNBD users. PCES does not have separate user classes, and any PCES user can add or delete PCES users.

### **1.10.4 Agency separation**

PCES does not support agency separation. All PCES surveillances are visible to all PCES users.

### **1.10.5 Bearer Channel Tandeming**

PCES does not perform call content interception using Bearer Channel Tandeming (BCT), hence all references to BCT and configuring a UAS for BCT do not apply.

### **1.10.6 Call Content delivery via CCRs**

PCES does not deliver call content to the LEA. Instead, Call Content is delivered by the CMTS or MG to the DF, which forwards call content to the LEAs as required. Consequently there is no provisioning of CCCs, or CCRs for PCES, nor is there any associating CCRs with or disassociating CCRs from a surveillance.

USNBD supports a test call capability in order to test CCRs. Since PCES does not provide the call content delivery directly to the LEA, it does not have CCRs and does not have the capability to test CCR call setup.

### **1.10.7 Call Data delivery via CDCs**

PCES does not deliver call data to the LEA. Instead, Call Data is delivered by the CMTS, and EMDI to the DF, which forwards call data to the LEAs as required. Consequently there is no provisioning of CDCs for PCES, nor is there any associating CDCs with or disassociating CDCs from a surveillance.

### **1.10.8 In-Band Digit Collection**

A USNBD surveillance can be provisioned to provide in-band digit collection. PCES does not provide this capability. In the PacketCable architecture in-band digit collection can be provided by the DF. In order to allow the DF to perform in-band digit collection it is necessary to provide the DF with the call content by provisioning the PCES surveillance as data\_content. A properly configured DF can then provide call content or call data to law enforcement as required.

### **1.10.9 In-band CCC\_ID tagging**

A USNBD surveillance can be provisioned to provide the CCC\_ID tag in-band on the call content channel. PCES does not provide call content directly to the LEA. This functionality could be provided by the DF, but is not discussed in the PacketCable specifications.

### **1.10.10 Provisioning surveillance**

NN10188-511 notes that lawful interception is provisioned on a line using the USNBD feature. This should also reflect that PacketCable-compliant Lawful Interception should be provisioned using PCES instead of USNBD.

## **1.11 Data schema (DS)**

No existing tables are modified and no new tables are introduced by this feature. The DF IP address and port, and the CBM application IP address and port, should be entered in Table PCEMENTT prior to defining surveillances.

## **1.12 Office parameters (OP)**

No new office parameters are introduced as part of this functionality.

## **1.13 Service orders (SO)**

No changes to Service Orders are required by this feature.

## **1.14 Alarms (AL)**

No new Alarms are introduced as part of this functionality.

## **1.15 Command interface (CI)**

### **1.15.1 New/modified commands**

This feature introduces a new CI which is used to provision PacketCable surveillances. Table 3 lists the set of PCES user commands.

**Table 3 PCES Commands**

| CI Command                                                                                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| >PCES                                                                                                                    | Enter the PacketCable Electronic Surveillance CI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| >SURV ADD DN <10-digit DN><br><Case ID><br><br><SIN><br><br><Monitor Type><br><br><MRP><br><br><Delivery Function Index> | <p>Add a PCES surveillance by DN.</p> <p>The case ID is an arbitrary character string (up to 10 characters) which may be used for administrative purposes.</p> <p>The SIN is an alphanumeric string Surveillance Identification Name (up to 10 digits) which is used to uniquely identify a surveillance, and must be unique across all surveillances.</p> <p>The Monitor Type specifies whether it is a data-only surveillance (data) or a data-plus-content surveillance (data_content).</p> <p>The MRP field specifies whether Monitored Replacement Party functionality should be assigned to the surveillance. A Replacement Party is a party which the subject redirects his or her calls to, for example by Call Forwarding. The MRP field must be set to 'Y' since PacketCable 1.1 requires Replacement Parties to be monitored.</p> <p>The Delivery Function Index (or DF Index) is the index of the DF associated with the surveillance. This is the index which was assigned to the DF when it was entered in Table PCEMENTT.</p> |
| >SURV DEL <sin>                                                                                                          | Delete a PCES surveillance by SIN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| >SURV LIST <option>; option = {all   act  <br>inact   dn   sin}                                                          | List PCES surveillance(s)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| >SURV ACT <sin>                                                                                                          | Activate a PCES surveillance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| >SURV DEACT <sin>                                                                                                        | Deactivate a PCES surveillance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| >USER ADD <user_id>                                                                                                      | Define a new PCES user. The user_ID must already be defined as a valid login ID for the CS2K CM (e.g., using the PERMIT command)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| >USER DEL <user_id>                                                                                                      | Delete a PCES user                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| >USER LIST ALL                                                                                                           | List all PCES users                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| >HELP <option>; option = {help   surv   quit<br>  user}                                                                  | PCES CI help                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



### 1.15.2 Process of configuring PCES

1. Activate PCEM event messaging
2. SOC on PCES
3. Configure the EMDI in Table PCEMENTT
4. Bring the EMDI into service
5. Configure the DF in Table PCEMENTT

### 1.15.3 Process of setting up a PCES surveillance

1. Define the surveillance using the SURV ADD command

Example of adding a surveillance:

```
>surv add dn 9194303602 fbi sin123 data_content Y 4
```

Note that in PacketCable terminology the term Surveillance means call data only (data) and Intercept means call data plus call content (data\_content).

2. Activate the surveillance using the SURV ACT command

Example of activating a surveillance:

```
>surv act sin123
```

No monitoring is provided for any calls the subject is involved in when the surveillance is activated. Monitoring of calls will begin after the subject line becomes idle.

### 1.15.4 Process of removing a PCES surveillance

1. Deactivate the surveillance using the SURV DEACT command

Example of deactivating a surveillance:

```
>surv deact sin123
```

Note that when a surveillance is deactivated, any monitored calls in progress will continue to be monitored until completion. The DF may provide the capability to terminate monitoring at any time.

2. Delete the surveillance using the SURV DEL command

Example of deleting a surveillance:

```
>surv del sin123
```

## 1.16 Operational measurements (OM)

No new OMs are introduced as part of this functionality.

OM group PCEM pegs success or failure for every PCEM event message generated by the CM. PCES event messages are PCEM messages cause these registers to be incremented.

The register names and definitions are shown in Table 4 below.

**Table 4 PCEM OM Group Register Definitions**

| <b>PCEM Register Name</b> | <b>Definition</b>                    |
|---------------------------|--------------------------------------|
| EMSENT                    | Event message successfully generated |
| EMFAIL                    | Failed to build event message.       |
| EMSYSFL                   | System unable to send event message. |
| EMSENT2                   | Overflow register for EMSENT         |
| EMFAIL 2                  | Overflow register for EMFAIL         |
| EMSYSFL2                  | Overflow register for EMSYSFL        |

### 1.17 AMA/Billing information (AM)

PCES functionality requires the CS2K to be configured with PacketCable Event Messaging active. It does not require PacketCable event messaging Accounting to be active.

### 1.18 Software optionality control (SOC)

A new SOC code (NBD00005) has been implemented to support PCES and it has been added into the NBD SOC group.

NBD00005 requires NBD00003 (USNBD) to have SOC state ON. USNBD and PCES interworking is not supported and the two features cannot be used simultaneously on the same CS2K. Figure 5 lists the combinations of SOC codes that determine which application is active.

**Table 5 PCES/USNBD SOC states combinations**

| <b>NBD00003 USNBD SOC state</b> | <b>NBD00005 PCES SOC state</b> | <b>Active Application</b> |
|---------------------------------|--------------------------------|---------------------------|
| OFF                             | OFF                            | -none-                    |
| ON                              | OFF                            | USNBD                     |
| ON                              | ON                             | PCES                      |

## 1.19 Glossary

**Table 6 Terminology**

| Term | Definition                          |
|------|-------------------------------------|
| BCT  | Bearer Channel Tandeming            |
| CBM  | Core Billing Manager                |
| CCR  | Call Content Resource               |
| CDC  | Call Data Channel                   |
| CF   | Collection Function                 |
| CM   | Computing Module                    |
| CMS  | Call Management Server              |
| CMTS | Cable Modem Termination System      |
| CS2K | Call Server 2000                    |
| DF   | Delivery Function                   |
| EM   | Event Message                       |
| EMDI | Event Message Delivery Interface    |
| EMS  | Event Message Sender                |
| GW   | Gateway                             |
| GWC  | Gateway Controller                  |
| IAP  | Intercept Access Point              |
| IAA  | Integrated Accounting Application   |
| LEA  | Law Enforcement Agency              |
| LNP  | Local Number Portability            |
| MGC  | Media Gateway Controller            |
| MRP  | Monitored Replacement Party         |
| MTA  | Multimedia Terminal Adapter         |
| PC   | PacketCable                         |
| PCEM | PacketCable Event Messaging         |
| PCES | PacketCable Electronic Surveillance |
| RKS  | Record Keeping Server               |
| SDM  | Supernode Data Manager              |
| SIN  | Surveillance Identification Number  |

**Table 6 Terminology**

| Term  | Definition                        |
|-------|-----------------------------------|
| SOC   | Software Optionality Control      |
| TGCP  | Trunking Gateway Control Protocol |
| USNBD | US Network Broadcast Delivery     |
| VoIP  | Voice over IP                     |

***Product = CS 2000***

## **A00007602--SDM Software Authenticity**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS, PT-AAL2

#### **1.2 Description**

The intent of this feature is to add more security to the SDM software delivery (patches and ESD loads), and guarantee that the SDM deliverable sent to the field is authenticated by Nortel.

Without this authentication a third party could deliver rogue software to a customer and there would be no way of detecting it. This feature will implement a method of digitally signing any software created by the SDM development team. The SDM deliverable would then be signature checked prior to being applied on the customer system.

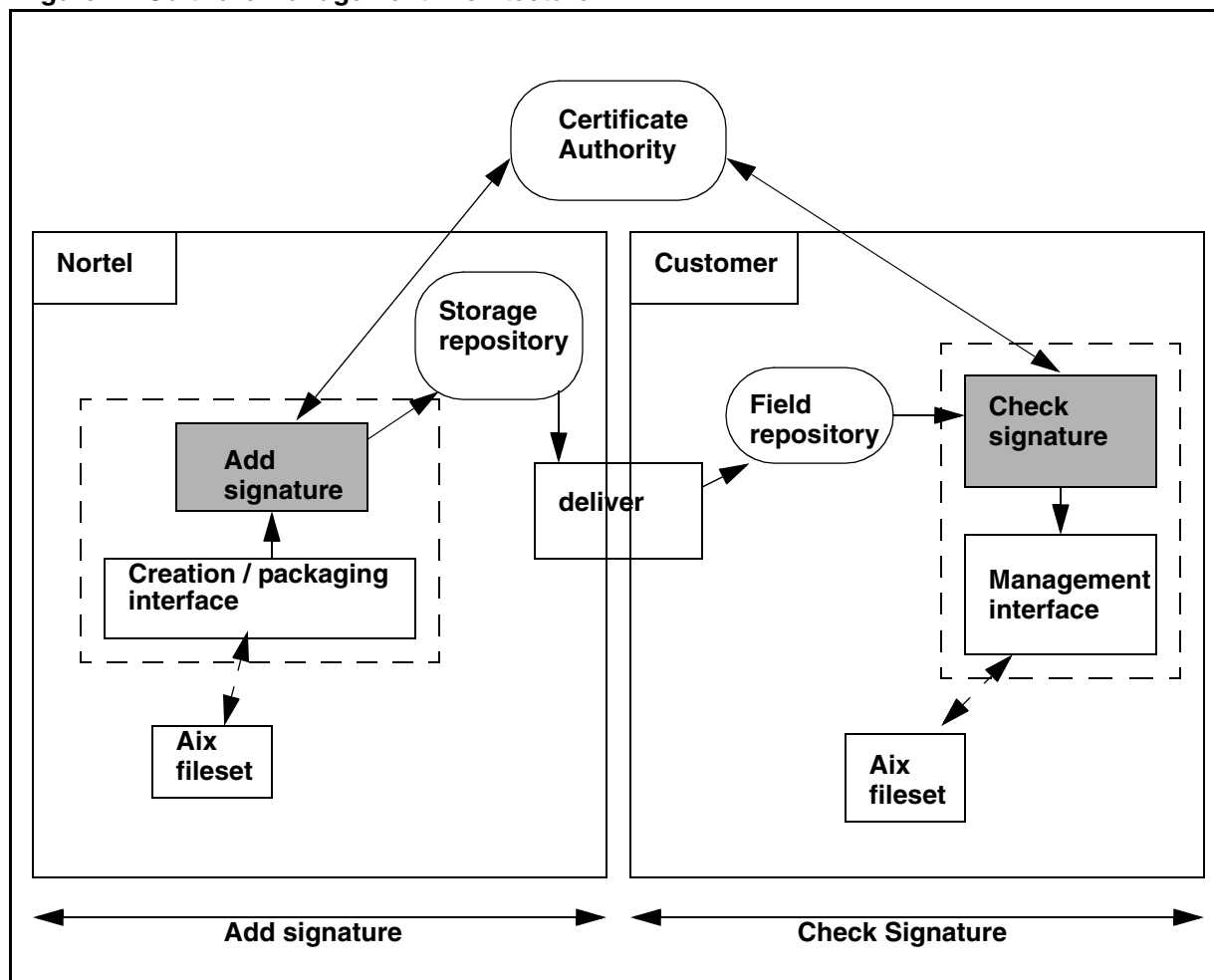
This FN document describes the new procedures for the following software delivery applications, using software authentication:

- Patch Apply: New alarms and security logs are created to reflect patch signature check failures. An alarm clearing mechanism is also available to manually clear alarms after detecting bad software. Please refer to section 1.6.1 “Patch Apply” on page 1394 for the full details.
- ESD Load Upgrade: A signature check for the ESD load is done manually prior to the load upgrade. Descriptive messages are displayed to reflect software signature check failures. Please refer to section 1.6.2 “ESD load Upgrade” on page 1401 for the full details.

In SN08, this feature is primarily concerned with Electronic Software Delivery (ESD) and does not provide a solution to authenticate physical media (i.e. tapes).

Figure 1 “Software Management Architecture” on page 1393, provides a high level overview of the SDM software management architecture in SN08.

**Figure 1 Software Management Architecture**



### 1.3 Hardware Requirements or Dependencies

SDM system equipped with the SN08 hardware base line configuration.

### 1.4 Software Requirements or Dependencies

SDM system installed with the SN08 software.

### 1.5 Limitations and restrictions

- This feature supports software authentication only on the SDM platform in SN08, and does not support the CBM platform.

- The software authentication feature is not enabled on the SDM by default. In order to enable this functionality, the user needs to manually install the “SDM software Authentication services” package which will be part of the SDM SN08 load. Please refer to the SN08 SDM SW upgrade customer documentation (Upgrading the SDM - NN10059-461) for full details on how to install a SDM package.
- The software authentication functionality is only supported on patches and ESD loads, and does not support physical media (i.e. tapes). Applying software from physical media will succeed, but will not be authenticated.
- Customer documentation and release notes are not authenticated in SN08.
- Software loads that are serviced by the SDM’s bootp server, packaged through RPM (Redhat Package Manager), will not be authenticated in SN08. These packages are:
  - MG9K0070 (MG9K)
  - GWCC0070 (NA-GWC)
  - GWCW0070 (INTL-GWC)
  - SAM20070 (SAM21)
  - 3PC00070 (3PC)

## 1.6 Interactions

### 1.6.1 Patch Apply

The patch apply procedure (customer documentation) in SN08 is exactly the same as in SN07. In SN08, all patches are digitally signed during packaging, and a signature check is applied on each patch prior to patch apply. This signature check procedure is completely transparent to the user.

Signature check failures are reported as follows:

- A new “SDM Patch Check Status” indicator is introduced under the “sdmmtc sys” level. This state will reflect “Failed”, once a single patch fails signature checking. Please refer to 1.6.1.1 “Minor alarm to reflect patch signature check failure” on page 1395 for more details.
- A new minor alarm is generated under the “sdmmtc sys” level. Please refer to 1.6.1.1 “Minor alarm to reflect patch signature check failure” on page 1395 for more details.
- New security logs are generated to report patch signature check failures and manual alarm clearing. Please refer to 1.6.1.3 “Security logs to reflect Patch signature check failure” on page 1401 for more details.

All patches that fail signature checking will be moved to the following directory on the SDM:

/swd/sdm/fixes/rejected

A manual alarm clearing mechanism is provided to clear the alarm after detecting bad patches. Please refer to 1.6.1.2 “Manual alarm clearing” on page 1397 for more details.

#### 1.6.1.1 Minor alarm to reflect patch signature check failure

A new “SDM Patch Check Status” indicator is introduced under the “sdmmtc sys” level, to reflect the state of patch signature checking. By default this status indicator is set to “.” (in-service), to indicate that no patch failed through signature checking prior to patch apply. Figure 2 “SDM Patch Check Status indicator” on page 1396 reflects the new patch check status indicator.

The user will receive no indication of successful patch checking/apply. Once a single patch fails signature checking, the “SDM Patch Check Status” indicator will reflect a “Failed” indication, and a minor alarm will be generated under the “sdmmtc sys” level. Figure 3 “Patch signature check failure indication” on page 1397 reflects a failure with the patch signature checking.

A security log is generated to reflect the signature check failure (associated with the minor alarm). Please refer to 1.6.1.3 “Security logs to reflect Patch signature check failure” on page 1401.

**Note:** Patches that fail signature checking will not be listed under “sdmmtc swim apply” level once the source command is invoked. The failed patches will be moved to the /swd/sdm/fixes/rejected directory. It is expected that the user detects the minor alarm, reads the security log, and checks the rejected directory for the failed patches.

**Figure 2 SDM Patch Check Status indicator**

|             |     |     |     |      |     |    |                                       |
|-------------|-----|-----|-----|------|-----|----|---------------------------------------|
| SDM         | CON | 512 | NET | APPL | SYS | HW | CLLI: SNM0                            |
| .           | .   | ..  | .   | .    | .   | .  | Host: wcary2p3                        |
|             |     | ..  |     |      |     |    | Fault Tolerant                        |
| Sys         |     |     |     |      |     |    |                                       |
| 0 Quit      |     |     |     |      |     |    | SDM Storage State: .                  |
| 2           |     |     |     |      |     |    | SDM Backup Status: .                  |
| 3           |     |     |     |      |     |    | SDM Configuration State: .            |
| 4 Logs      |     |     |     |      |     |    | SDM System Audit Status: .            |
| 5 Storage   |     |     |     |      |     |    | <b>SDM Patch Check Status: .</b>      |
| 6           |     |     |     |      |     |    | # Description                         |
|             |     |     |     |      |     |    | Current / Threshold                   |
| 7           |     |     |     |      |     |    | 1 CPU (run queue entries): 0 / 5      |
| 8           |     |     |     |      |     |    | 2 Number of Processes: 81 / 250       |
| 9           |     |     |     |      |     |    | 3 Number of Zombies: 0 / 3            |
| 10          |     |     |     |      |     |    | 4 Number of Swap Queue Entries: 0 / 2 |
| 11          |     |     |     |      |     |    |                                       |
| 12          |     |     |     |      |     |    |                                       |
| 13          |     |     |     |      |     |    |                                       |
| 14 QuerySDM |     |     |     |      |     |    |                                       |
| 15 Locate   |     |     |     |      |     |    |                                       |
| 16          |     |     |     |      |     |    |                                       |
| 17 Help     |     |     |     |      |     |    |                                       |
| 18 Refresh  |     |     |     |      |     |    |                                       |
| root        |     |     |     |      |     |    |                                       |
| Time 12:42  |     |     |     |      |     |    | >                                     |



**Figure 3 Patch signature check failure indication**

|             |     |     |     |      |      |    |                                       |
|-------------|-----|-----|-----|------|------|----|---------------------------------------|
| SDM         | CON | 512 | NET | APPL | SYS  | HW | CLLI: SNM0                            |
| ISTb        | .   | ..  | .   | .    | ISTb | .  | Host: wcary2p3                        |
|             |     | ..  |     |      |      |    | Fault Tolerant                        |
| Sys         |     |     |     |      |      |    |                                       |
| 0 Quit      |     |     |     |      |      |    | SDM Storage State: .                  |
| 2           |     |     |     |      |      |    | SDM Backup Status: .                  |
| 3           |     |     |     |      |      |    | SDM Configuration State: .            |
| 4 Logs      |     |     |     |      |      |    | SDM System Audit Status: .            |
| 5 Storage   |     |     |     |      |      |    | <b>SDM Patch Check Status: Failed</b> |
| 6           |     |     |     |      |      |    | # Description                         |
|             |     |     |     |      |      |    | Current / Threshold                   |
| 7           |     |     |     |      |      |    | 1 CPU (run queue entries): 0 / 5      |
| 8           |     |     |     |      |      |    | 2 Number of Processes: 81 / 250       |
| 9           |     |     |     |      |      |    | 3 Number of Zombies: 0 / 3            |
| 10          |     |     |     |      |      |    | 4 Number of Swap Queue Entries: 0 / 2 |
| 11          |     |     |     |      |      |    |                                       |
| 12          |     |     |     |      |      |    |                                       |
| 13          |     |     |     |      |      |    |                                       |
| 14 QuerySDM |     |     |     |      |      |    |                                       |
| 15 Locate   |     |     |     |      |      |    |                                       |
| 16          |     |     |     |      |      |    |                                       |
| 17 Help     |     |     |     |      |      |    |                                       |
| 18 Refresh  |     |     |     |      |      |    |                                       |
| root        |     |     |     |      |      |    |                                       |
| Time 12:42  |     |     |     |      |      |    | >                                     |

**1.6.1.2 Manual alarm clearing**

A manual alarm clearing mechanism is provided to clear the minor alarm generated by the patch signature check failure. Once the failure is detected, the user can clear the minor alarm manually by executing the “patch clear” command from the “sdmmtc sys” level. Please refer to Figure 4 “Manual alarm clearing” on page 1399 for the actual command invocation and system responses.

Once the alarm is manually cleared, the “SDM Patch Check Status” indicator is set to “.” as shown in Figure 2 “SDM Patch Check Status indicator” on page 1396.

A security log is generated to reflect alarm clearing. Please refer to 1.6.1.3 “Security logs to reflect Patch signature check failure” on page 1401 for the actual log generated.

**Figure 4    Manual alarm clearing**

```

SDM   CON  512  NET  APPL  SYS  HW  CLI: SNM0
ISTb   .    . .    .    .    ISTb   .    Host: weary2p3
      . .                               Fault Tolerant

Sys
0 Quit          SDM Storage State: .
2              SDM Backup Status: .
3              SDM Configuration State: .
4 Logs         SDM System Audit Status: .
5 Storage      SDM Patch Check Status: Failed
6              # Description                      Current / Threshold
7              1 CPU (run queue entries):         0 / 5
8              2 Number of Processes:             81 / 250
9              3 Number of Zombies:               0 / 3
10             4 Number of Swap Queue Entries:     0 / 2
11
12
13
14 QuerySDM
15 Locate
16
17 Help
18 Refresh
   root
Time 12:42 > patch clear

=====

14 QuerySDM
15 Locate      This will clear the Patch Check status and alarm. Please insure
16             that the failed patch is removed from the system.
17 Help        Do you wish to proceed?
18 Refresh     Please confirm ("YES", "Y", "NO", or "N")
   root
Time 14:35 > y

=====

14 QuerySDM
15 Locate
16
17 Help
18 Refresh     Patch clear - Command complete.
   root
Time 14:36 >

```

### 1.6.1.3 Security logs to reflect Patch signature check failure

Security logs are generated to reflect patch signature check failure and alarm clearing. Examples of the security logs are shown in Figure 5 “Security logs” on page 1401.

**Figure 5 Security logs**

#### **Signature check failure:**

Aug 24 14:58:02 wcary2p4 syslog: SDM337 MINOR TBL SDM Base Maintenance  
Patch NT\_SIM.tools-21.35.6.2.patch failed signature checking.

#### **Alarm clearing:**

Aug 24 15:05:32 wcary2p4 syslog: SDM637 NONE INFO SDM Base Maintenance  
Patch check status is cleared by user.

## 1.6.2 ESD load Upgrade

An extra step is required to the ESD load upgrade procedure in SN08. A signature check is applied on all of the filesets included in the ESD load. A successful signature check is required on all of the filesets, for the ESD load to pass signature checking. If at least one fileset fails signature checking, the whole load must be rejected.

In summary, the following steps are required for an ESD load upgrade:

- Create a filesystem on the SDM (ex: /load), to hold the ESD load.
- Download the ESD load into the SDM (under the created filesystem).
- Extract the load (unzip/untar the load).
- Invoke signature checking (new step introduced in SN08). Please refer to 1.6.2.1 “ESD Load signature checking” on page 1401 for full details.
- Upgrade the SDM to the new load, provided that a successful signature check is achieved.

Please refer to the SN08 SDM SW upgrade customer documentation (Upgrading the SDM - NN10059-461) for full details of the ESD load upgrade. This section will only address the new introduced ESD load signature checking step.

### 1.6.2.1 ESD Load signature checking

A new command “verifyload” is introduced in SN08 to perform a signature check on the ESD load. This command is packaged within the ESD load. Once the load is extracted on the SDM, the user is expected to invoke the

“verifyload” command manually from the command line before starting the upgrade.

No alarms and security logs are generated in case the ESD load fails signature checking. Instead, a message is displayed on the screen indicating the result of the signature check. It is the responsibility of the user to reject the load and contact “Nortel next level of support” in case of a signature check failure.

Figure 6 “ESD load signature check” on page 1402 show the actual command to perform the signature check on ESD load, and the different expected return messages (success and failure). The “verifyload” command is located under the same directory as the ESD load (the filesystem that holds the load).

**Figure 6 ESD load signature check**

```
# ./verifyload
```

Checking the integrity of the load, please wait....

**Successful return message:**

Integrity and signature check completed successfully.  
Please continue with the upgrade.

**Failure return messages (could be either one of the following messages):**

This load include missing packages.  
Please contact your next level of support.

This load include zero size packages.  
Please contact your next level of support.

This load failed signature checking.  
Please contact your next level of support.

Signature check cannot not be completed.  
Please contact your next level of support.

Integrity check failed, unknown failure.  
Please contact your next level of support.

## 1.7 Glossary

| Term     | Description                       |
|----------|-----------------------------------|
| ESD load | Electronic Software Delivery load |

| Term | Description            |
|------|------------------------|
| SDM  | SuperNode Data Manager |
| CBM  | Core Billing Manager   |
| ISTb | In Service Trouble     |
| SW   | Software               |

## 1.8 References

[1] Upgrading the SDM - NN10059-461

## *Product = CS 2000*

## **A00007635--CBM Upgrades**

### *Functional Description*

#### **1.1 Applicable Solution(s)**

PT-IP, DMS, PT-AAL2

#### **1.2 Description**

The purpose of this feature is to provide a mechanism to upgrade the CBM 850 product from release CBM07 to release CBM08. The CBM 800 product is not being released for CBM08 and will not be discussed within this document.

The CBM upgrade procedure will involve the upgrade of the SSPFS platform and the upgrade of the CBM applications. The upgrade of the SSPFS platform will not be discussed within this document as it will be discussed within the “SSPFS Upgrades For SN08, A0000817” feature FN. It is important to note that the CBM upgrade procedure will be automatically initiated by the SSPFS platform upgrade.

Another important note is that the CBM07 applications will still reside on the CBM after a successfully completed upgrade. These applications will be dormant however. A separate procedure outside of the upgrade will allow the customer to remove “older” versions of software that are dormant on the system and will not be discussed within this document.

The CBM 850 product is a High Availability cluster made up of an active node and an inactive node. To ensure that the CBM will remain within an HA configuration, a separate boot environment (BE) on the inactive node is

created in which the application upgrade will actually take place. This means that inactive node is still running the CBM07 release in standby mode. This process is actually performed using the Sun Solaris LiveUpgrade suite. The creation of this separate BE will be performed within the SSPFS platform upgrade procedure.

For CBMs in wireless market, the CBM Upgrade will automatically initiate the Wireless upgrade procedure after the required packages, value added packages and patches are applied to the system.

A successful CBM upgrade procedure is as follows:

**Note:** The creation of the separate boot environment and the upgrade of the operating system and other platform software within this separate environment would have been completed by the SSPFS platform upgrade. The CBM procedure starts when the platform upgrade initiates the CBM upgrade.

**Note:** Once the “clone” has been initiated at the end of a successful upgrade, NO fallback to CBM07 will be possible. In order to return the CBM to the CBM07 release, a restore or a fresh install would be required.

- Load the CBM08 software media (CDROM or ESD image file)
- Perform pre-upgrade checks
- Upgrade all CBM08 850 required packages
- Upgrade all value added CBM08 packages
- Apply patches, if any, for the CBM08 load
- Initiate Wireless Upgrade (if necessary)
- Perform post-upgrade checks
- Activate CBM08 load and reboot the CBM08 Inactive node (automatically done by SSPFS upgrade script)
- Perform SWACT from CBM07 node to the CBM08 node (manually initiated by the user)
- Clone the CBM08 node onto the CBM07 node (manually initiated by the user)

### 1.2.1 Logs

Upgrade logs for the CBM will be located within the /var/adm/ directory of the CBM07 environment in a file called cbm\_upgrade\_<from>\_to\_<to>.log where “from” and “to” are the release numbers involved. This log will be transferred to the CBM08 environment before the SWACT.



A customer log will be generated for any CBM upgrade failure. The log will identify the upgrade stage at which failure occurred, the upgrade log.

## 1.2.2 Failures

If a failure occurs during the upgrade, a message will be displayed to the user describing the failure and informing the user to contact next level support. The user will be provided a prompt to 1) Enter a maintenance shell where command could be executed in an attempt to correct the error. Exiting the maintenance shell will re-execute the step that failed. 2) Perform a fallback. This will send a signal back to the SSPFS upgrade for SSPFS to initiate a fallback. Both the Maintenance Shell and the Fallback have a yes/no user confirmation, answering no will re-execute the failed step.

### 1.2.2.1 Fallbacks

Fallbacks during the CBM upgrade would depend on which CBM load, 07 or 08, has been Activated on the inactive node at the time. A fallback will mean that the CBM inactive node will be put back into its original configuration of CBM07 inactive.

If a failure occurs before the “Activate CBM08 load and reboot the Inactive” step then,

- The user would have requested a fallback at a fallback prompt
- The CBM08 separate environment will be deleted

If a failure occurs after the “Activate CBM08 load and reboot the Inactive” upgrade step, but before the SWACT, then,

- The user would execute the SSPFS fallback command
- The CBM07 load will be “Activated” on the inactive node
- The Inactive node will be rebooted
- The CBM08 separate environment will be deleted

If a failure occurs after the SWACT from the CBM07 active node to the CBM08 inactive node then,

- The user would execute the SSPFS fallback command
- A SWACT is performed back to the CBM07 node
- The CBM07 load will be “Activated” on the inactive node
- The Inactive node will be rebooted
- The CBM08 separate environment will be deleted

### 1.3 Hardware Requirements or Dependencies

- CBM850 HA dual node Cluster hardware baseline
- HA Cluster must be fully in-service
- HA cluster must have no alarms

### 1.4 Software Requirements or Dependencies

- CBM must have a patch current CBM07 release.
- All CBM applications must not be in the Fail or Sysb state

### 1.5 Limitations and restrictions

- The CBM08 upgrades will not include the CBM800 product. Only the CBM850 HA configuration will be supported.
- The CBM08 media (CD or ESD) must have been delivered to the customer site prior to the commencement of the upgrade
- The ESD image must be located within the /swd/sdm directory.
- There is no upgrade support for single server CBM 850. A single server 850 must be converted into a dual node HA cluster configuration running CBM07 before being upgraded to CBM08.

### 1.6 Interactions

The CBM upgrade process involves the initial execution of the SSPFS platform upgrade procedure from which the CBM upgrade procedure will be automatically initiated.

#### 1.6.1 Load the CBM08 software media (CDROM or ESD image file)

The CBM load is available on CDROM and via an ESD image (Electronic Software Delivery).

The user will be asked which media type they will be using (CDROM or ESD)

For CDROM, the user will be asked to place the CBM CD disk into the CDROM drive on the Inactive Node. The user will be prompted to “Start” the upgrade once the CDROM has been placed into the drive.

For ESD, the ESD image will be prepared for use and the CBM upgrade will be started automatically. The user will be notified if the ESD image has not been found in the proper location or if there is a problem extracting and preparing the ESD image for use.

In the event of any failure, the user will be prompted to

- 1) Enter a maintenance shell to suspend the upgrade and correct the failure,
- 2) perform a fallback to cancel the upgrade.

### **1.6.2 Perform Pre-upgrade checks**

The prechecks for the CBM upgrade will be performed before any software is upgraded.

#### **1.6.2.1 Examine CBM alarm and Node states**

The CBM should have no major alarms before attempting to perform the CBM upgrade. If an alarm does exist, the user will be notified to contact next level support and is provided a prompt to 1) Suspend the upgrade and enter a maintenance shell to investigate the alarms, 2) perform a fallback to cancel the upgrade and 3) Continue with the upgrade, ignore the alarms.

#### **1.6.2.2 Verify separate upgrade environment**

If the separate boot environment does not exist the user will be notified that the separate boot environment does not exist and that the CBM upgrade cannot be executed.

The only way for a user to obtain this message would be if the `cbm_setup` upgrade script was being executed manually for an upgrade and the `sspf` platform had not been performed.

#### **1.6.2.3 Verify the CBM base directory**

All CBM packages have what is called a BASE Directory or BASEDIR. The directory must exist before attempting to apply the CBM packages.

The platform upgrade will create this directory because there is a CBM package that gets applied during their upgrade procedure. In the event that the directory does not exist, it will be created automatically.

If the directory does not exist, the user will be notified that the CBM Base directory does not exist and that it will be created.

#### **1.6.2.4 Examine installed software**

In order to apply the common packages, a list of the applications that are currently installed within the separate boot environment is generated. This list is required for future steps of the upgrade.

In the event that the software list cannot be created, the user will be notified that there appears to be a problem with the separate boot environment and that the CBM upgrade cannot continue.

### **1.6.3 Upgrade all CBM08 850 required packages**

Required packages are the core applications on the CBM that provide base and service level support.

In the event of a failure to apply any one of the packages the user will be notified of the failure, where the log can be obtained and that they should contact next level support and is provided a prompt to 1) Suspend the upgrade and enter a maintenance shell to correct the failure, 2) perform a fallback to cancel the upgrade.

#### **1.6.4 Upgrade all value added CBM08 packages**

Value added packages are applications that do not make up the required list of applications. The separate boot environment is examined for CBM07 applications. All CBM07 applications that exist within the separate environment and have not yet been upgraded to the CBM08 load are automatically “selected” and applied. A list of the “selected” packages is displayed and then the status of applying each package is displayed.

In the event the CBM does not have any “value added” packages, this step will not be executed.

The actual apply of the value added packages is performed using the command line version of the well known SDM/CBM SWIM application. The output of the swim command line is the same as the output of the SWIM applications within the sdmmtc/cbmmtc interface.

Value added packages may have a “configuration” script that needs to be executed after installation. The scripts will prompt the user for information that will be used later on when the application is turned on or RTS'd.

In the event that there are configuration scripts to apply, the user will be notified that the scripts will be executed in which the user will be requested to press ‘return’ to start the execution of the scripts.

In the event of a failure to apply any one of the packages the user will be notified of the failure, where the log can be obtained and that they should contact next level support and is provided a prompt to  
1) Suspend the upgrade and enter a maintenance shell to correct the failure,  
2) perform a fallback to cancel the upgrade.

#### **1.6.5 Apply patches, if any, for the CBM08 load**

Once all the CBM08 packages have been applied into the separate boot environment, any patches that have been delivered with the CBM media are automatically applied, making the CBM08 load patch current.

The output of the patch apply is the same output as the current CBM patchctrl command.

In the event of a failure to apply any one of the patches the user will be notified of the failure, where the log can be obtained and that they should contact next level support and is provided a prompt to

- 1) Suspend the upgrade and enter a maintenance shell to correct the failure,
- 2) perform a fallback to cancel the upgrade.

### 1.6.6 Initiate Wireless Upgrade

For CBMs within the wireless market, there are additional packages that need to be upgraded. These packages reside on a different media than the CBM product.

If the CBM is a wireless CBM, the wireless upgrade start script will automatically be executed.

### 1.6.7 Perform post-upgrade checks

To ensure that the CBM is still in a healthy state before we perform the reboot and swact upgrade stages, the following checks will be performed.

The CBM should have no major alarms before attempting to perform reboot and swact portion of the upgrade. If an alarm does exist, the user will be notified to contact next level support to investigate the alarm and is provided a prompt to 1) Enter a maintenance shell to investigate the alarms, 2) perform a fallback to cancel the upgrade and 3) Continue with the upgrade, ignore the alarms.

### 1.6.8 Activate CBM08 load and reboot the inactive node

The separate boot environment is automatically “activated” which prepares the system to have the CBM08 load upon a reboot. The activation and reboot of the inactive node is done by the SSPFS upgrade script once the CBM portion of the upgrade is successfully completed.

*Note:* Only the inactive node will be rebooted. The Active node running the CBM07 release will still be providing service.

### 1.6.9 Perform SWACT from CBM07 node to the CBM08 node

Since the CBM upgrade script is no longer running, this step will be a documented procedure. Within documentation, the user will be requested to log into the CBM07 active node as the root user once the CBM08 inactive node has successfully rebooted. For the command line on the CBM07 active node, the user will be documented to execute the “init 0” command to force a swact and prepare the CBM07 active node for the clone operation if the upgrade is successful.

Executing the “init 0” will make the CBM08 inactive node the CBM08 active node, meaning that the new CBM08 software is now running. The CBM07 node is now the inactive node.

This process would be described in more detail within the “SSPFS Upgrades For SN08, A0000817” feature FN.

### 1.6.10 Clone the CBM08 node onto the CBM07 node

If the CBM08 active node applications are all INSV and operational, the documentation will inform the user to initiate the “clone” sequence to change the CBM07 inactive node into a CBM08 inactive node.

This process would be described in more detail within the “SSPFS Upgrades For SN08, A0000817” feature FN.

Fallbacks are no longer possible once this stage of the upgrade is initiated. A restore from backup or a fresh install would be required to go back to the CBM HA cluster running the CBM07 load.

## 1.7 Glossary

| Term        | Description                                    |
|-------------|------------------------------------------------|
| BE          | Boot Environment                               |
| SSPFS       | Succession Server Platform Foundation Software |
| LiveUpgrade | Sun Solaris LiveUpgrade tool suite             |

***Product = CS 2000***

## **A00007709--MCS CD Phase 2 Support**

### ***Functional Description***

### **1.1 Applicable Solution(s)**

DMS

### **1.2 Description**

MCS Converged Desktop Phase 2 is a MCS feature that has a dependency on switch-based functionality in order to provide the presence-indication and call logging services for non-MCS (i.e., switch-based) subscribers.

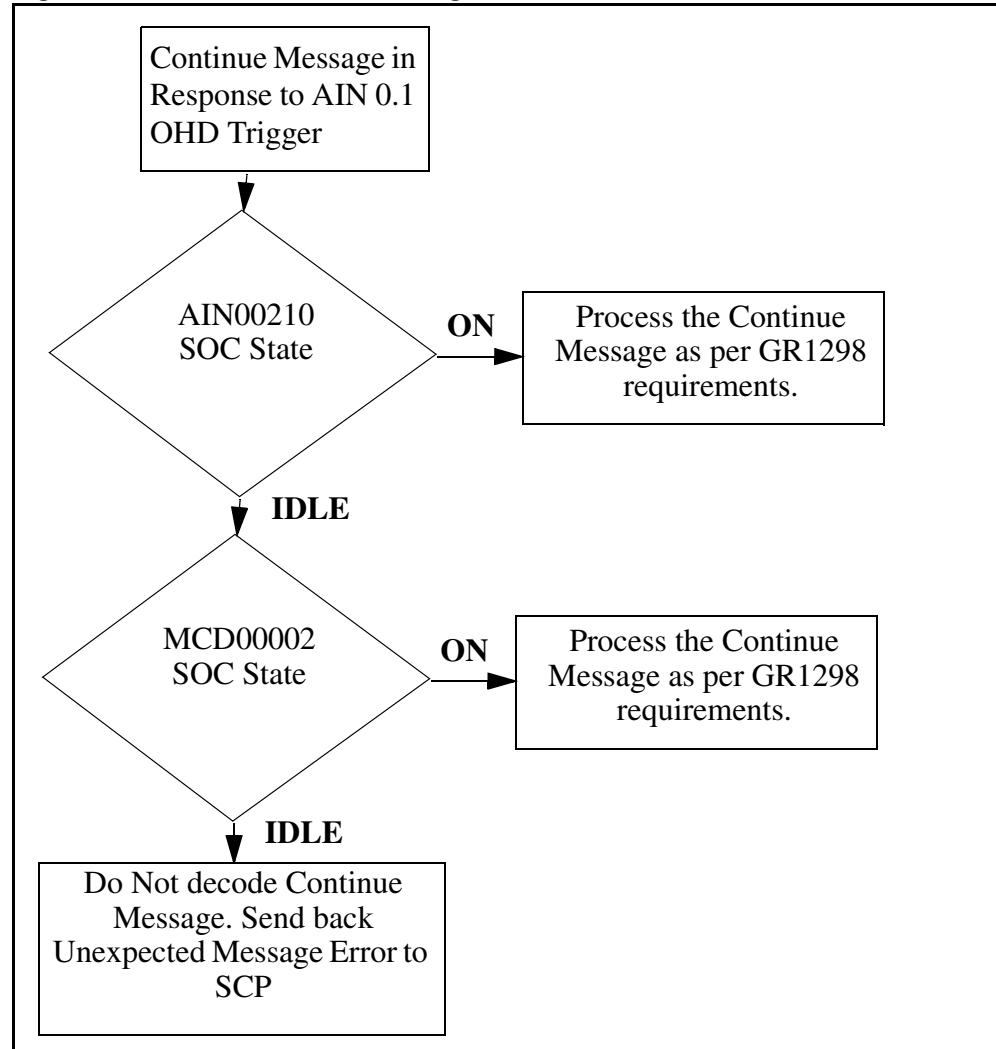
This switch-based functionality is controlled by a new Software Order Code (SOC) MCD00002 in SN08. This new order code implemented by this activity replaces ACT patches SBB44 for SN04/SN06/SN07 releases and TWH36 for SN06/SN07 releases.

This feature, when enabled via the SOC MCD00002 along with AIN 0.1 (AIN Essentials) software, will enable the MCS Converged Desktop Phase 2 feature to operate correctly. It does so by adding incremental AIN support for CONTINUE response to the AIN 0.1 Off Hook Delay (OHD) trigger query message.

The SOC option MCD00002 is dependent on AIN Essentials software; order code AIN00006. It may only be enabled and used in conjunction with MCS Converged Desktop and is not supported for any other application.

When a MCS CD office with patch TWH36/SBB44 activated on SN06/SN07 upgrades to SN08 or higher release, the SOC option MCD00002 will be automatically turned ON during ONP.

Please refer to figure 1 “Functional Behavior Diagram” on page 1412 for an overview of how SOC MCD00002 and AIN00210 control the AIN Continue message functionality for OHD trigger.

**Figure 1 Functional Behavior Diagram**

### 1.3 Hardware Requirements or Dependencies

None.

### 1.4 Software Requirements or Dependencies

AIN Essentials.

### 1.5 Limitations and restrictions

None.

### 1.6 Interactions

No new AIN feature interactions are introduced by this feature.



## 1.7 Glossary

| Term | Description                  |
|------|------------------------------|
| AIN  | Advanced Intelligent Network |
| CONT | Continue                     |
| SCP  | Service Control Point        |
| SOC  | Software Optionality Control |
| SSP  | Service Switching Point      |

***Product = CS 2000***

## **A00007752--Universal Billing Correlation ID**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS

#### **1.2 Description**

This activity will start the ground work for creating, storing and formatting a universal billing correlation id (UBCID). Currently the MCS generates its own BCID. The CS2K and GWC generate their own BCID for AMA/QOS correlation. With the various agents creating their own correlation id's, it is impossible to correlate the various records which can be produced during a call. Future activity work will provide correlation of these records from end to end.

PacketCable event messaging defines a billing correlation id which is currently used for the cable solution, since this correlation id is an accepted standard we will use the format defined by PCEM for our UBCID. The UBCID will be formatted for the following billing types: Bellcore AMA format (BAF), UCS Flex CDR and AT&T CDR2BAF format. There are currently other activities which are creating billing correlation id's for MCS and NGSS, future activity work will attempt to merge all of these billing correlation id into one format.

#### **1.3 Required Datafill Changes to activate this feature:**

The following sections describe the datafill changes required to activate this feature for both the BC AMA format and CDR billing formats.

### 1.3.1 BC AMA: Table AMAOPTS

To allow the recording of the UBCID for BC format AMA a new option “**CORRID**” is introduced into table AMAOPTS. This is an ON/OFF option. When “**CORRID**” is set to “**ON**”, a module code 613 will be appended to the base billing record which requires the collection of the UBCID.

| Table   | Desc                                                                                           |
|---------|------------------------------------------------------------------------------------------------|
| AMAOPTS | New option <b>CORRID</b> is added to the AMAOPTS table to capture the UBCID for BC AMA format. |

Sample datafill for table **AMAOPTS** (new field in bold).

| OPTION | SCHEDULE |
|--------|----------|
|--------|----------|

-----

|               |     |
|---------------|-----|
| CMCORIG       | ON  |
| CMCTERM       | ON  |
| COIN          | ON  |
| <b>CORRID</b> | ON  |
| CRSEQNUM      | OFF |
| CRT_BILLING   | OFF |

### 1.3.2 CDR: Table CDRTMPLT

To allow the capture and recording of the UBCID for CDR, new parameter “**CORRID**” is added to the list of parameters which can be datafilled in table CDRTMPLT.

| Table    | Desc                                                                                                         |
|----------|--------------------------------------------------------------------------------------------------------------|
| CDRTMPLT | A new parameter for the FIELDS and REORIGCP subfields of table CDRTMPLT is added to record the UBCID for CDR |

Sample datafill for table **CDRTMPLT** (new fields in bold):

NAME ACTIVE PRIMARY FIELDS REORIGCP

```
-----
CORRID_TMPLT Y N (SEQNUM) (CIC) (ORIGTIME) (ORIGDATE)
(ANSTYPE) (TIMECHNG) (ORIGAMPM) (INCINTL) (DISCTIME)
(DISCDATE) (ANISUFF) (DISCAMPM) (INCBILL) (FILL1) (CALLDUR)
(PINDIGS) (ANISP) (INFODIG) (BILLNUM) (ACCTCD) (CLGPTYNO)
(RLTCDR) (ACCTV) (UNIVACC) (DIALEDNO) (CALLEDNO)
(OUTPULNO) (FILL4) (ORIGOPRT) (PREDIG) (CNPREDIG) (OPART)
(TPART) (QUEUED) (FILL3) (FILL3) (FILL4) (RTENO) (NETSEC)
(OPCHOICE) (COLLTIME) (ADIN) (LNPCHECK) (NUMWBCKT)
(WBCKTS) (FINSID) (BILLTYPE) (ORIGGRP) (DISCTYPE) (ORIGMEM)
(PASSTHRU) (TERMGRP) (PRESIND) (TERMMEM) (OSRASSOC)
(DIGDATA) (FINTKGRP) (TRAP) (COSOVE) (FINTKMEM) (SCPBILL)
(FILL3) (FILL3) (FILL3) (FILL2) (FILL3) (FILL2) (TRTMTCD)
(COMPCODE) (CRID) (DNIS) (ORIGPVN) (TERMPVN) (ORIGLRN)
(PORTEDNO) (CAINCT) (ACG) (DNISNOA) (FILL1) (MLTCOSID)
(FILL4) (FILL1) (COSINDEX) (FILL2) (CARRSEL) (CORRID) (FILL8) $
$
```

## 1.4 Billing record layout and logs

### 1.4.1 BC format AMA - Module code 613

The option CORRID in table AMAOPTS triggers the additional module code 613 with context id 800xx for calls requiring the capture of the UBCID. The format of the module code 613 with the context id of 800xx is as follows:

- The context id 800xx is a 45 digit register.
- The first 8digits are the NTP timestamp.
- The next 5 digits is the Element\_id.
- The next 8 digits is the Time Zone.
- The next 10 digits is the Event counter
- These 35 digits combine to make up the UBCID
- The remaining 12 digits are padded with zeroes and a 'C' delimiter.

Below is a sample of the module code 613 which will be appended to the base billing record.

**Figure 2 Example of module code 613 With Context ID 800xx**

|                             |                  |                                |
|-----------------------------|------------------|--------------------------------|
| MODULE CODE:                | 613C             | GENERIC MOD: THREE DGT STR FMT |
| GENERIC CONTEXT ID:         |                  |                                |
| PARSE RULES                 | 800xx            | Universal Billing Corr ID      |
| SIGNIFICANT DIGITS          | 31C              |                                |
| GENERIC DIGIT STRING ONE:   | 132431017712391C |                                |
| GENERIC DIGIT STRING TWO:   | 345678123456781C |                                |
| GENERIC DIGIT STRING THREE: | 100000000000000C |                                |

**1.4.2 CDR: New Field Description**

The new data captured by this activity will be formatted into the CDR record using the following layout:

| Field Name | Chars | CDR Field Description                          |
|------------|-------|------------------------------------------------|
| CORRID     | 27    | Contains the Universal billing correlation id. |
|            |       |                                                |

Sample CDR Log (new fields in bold):

```

RTPC_B115BH    CDR273 FEB04 21:44:14 4200 INFO
CDR_CALL_ENTRY
250X15AY      CDR273 FEB09 13:44:20 0800 INFO CDR_CALL_ENTRY

RECCD      F0          TEMPLID    016
ACTIDX      6          TOOLGEN     Y
USEEDIT     N          VARLNGTH    N
SEQNUM      00001      CIC          5676
ORIGTIME    34992      ORIGDATE   035
ANSTYPE     03         TIMECHNG    N
ORIGAMPM    1          INCINTL     N
DISCTIME    35052      DISCDATE   035
ANISUFF     1          DISCAMPM    1
INCBILL     1          CALLDUR     00013107
PINDIGS     6987      ANISP      5124599628
INFODIG     1          BILLNUM     508543214997790000001234
ACCTCD      802000012345 CLGPTYNO    214684552900000
RLTCDR      Y          ACCTV       3
UNIVACC     8007654321 DIALEDNO    508345214997799
CALLEDNO    508543214997790 OUTPULNO    508345129479970
ORIGOPRT    501        PREDIG      1
CNPREDIG    1          OPART       511
TPART       31         QUEUED      Y
OPCHOICE    232        COLLTIME    060
ADIN        12         LNPNCHECK   7
NUMWBCKT    16         WBCKTS      10000000 10000000 00000000
FINSID      111        BILLTYPE    35
ORIGGRP     0353       DISCTYPE    1
ORIGMEM     0101       PASSTHRU    2
TERMGRP     0355       PRESIND     1
TERMMEM     0101       OSRASSOC    N

```

|          |                                 |          |                 |
|----------|---------------------------------|----------|-----------------|
| DIGDATA  | Y                               | FINTKGRP | 09999           |
| TRAP     | N                               | COSOVE   | Y               |
| FINTKMEM | 62843                           | SCPBILL  | FE17700B        |
| TRTMTCD  | 010                             | COMPCODE | 3               |
| CRID     | 684149400                       | DNIS     | 214684149400000 |
| ORIGPVN  | 214684149400000                 | TERMPVN  | 214684466200000 |
| ORIGLRN  | 2146841494                      | PORTEDNO | 2146844662      |
| CAINCT   | 1                               | ACG      | Y               |
| DNISNOA  | 103                             | MLTCOSID | 0001            |
| COSINDEX | 0001                            | CARRSEL  | 02              |
| CORRID   | 1324310177123913456781234567811 |          |                 |

## 1.5 Hardware Requirements or Dependencies

No special H/W requirements or dependencies.

## 1.6 Software Requirements or Dependencies

No special S/W requirements or dependencies.

## 1.7 Limitations and restrictions

This feature will not apply to MWC (MCI) or SSR (Sprint) loads.

## 1.8 Interactions

N/A

## 1.9 Applicable customer facing sections

Fault Management

Logs ☐ N/A

Alarms ☐ N/A

Configuration

Data Schema ☐ N/A

User Interface ☐ N/A

Element Management ☐ N/A

Security ☐ N/A

Service Order ☐ N/A

Office Parameters ☐ N/A

Accounting (includes AMA billing) ☐ X

Performance (includes operational measurements) ☐ N/A

## 1.10 Glossary

| Term   | Description                           |
|--------|---------------------------------------|
| BC AMA | Bellcore Automatic Message Accounting |
| CDR    | Call Detail Recording                 |
| MCS    | Multimedia Communications Server      |
| NGSS   | Next Generation Session Server        |
| SBA    | SuperNode Billing Application         |
| SDM    | SuperNode Data Manager                |
| UBCID  | Universal Billing Correlation ID      |
| PCEM   | Packet Cable Event Messaging          |

***Product = CS 2000***

## **A00007790--P-phone expansion for CICM lines**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP, DMS

#### **1.2 Description**

This feature will increase the number of Meridian Business Sets (such as M5216) which can be provisioned in Succession offices from the current limit of 31,743 to a new limit of 150,000. The same increase will apply to the number of add-on modules (such as M518 and M536) which can be assigned to these sets.

This activity will only impact the number of tuples which can be provisioned in table KSETINV. Other than that there are no customer visible changes to any of the Key-set provisioning tables nor is there any impact on Servord. There are also no customer visible changes to any of the functionality currently provided by Meridian Business Sets.

#### **1.3 Hardware Requirements or Dependencies**

Not applicable.

## 1.4 Software Requirements or Dependencies

None.

## 1.5 Limitations and restrictions

Although this feature is being done mainly to support Centrex IP clients which are provisioned as M5216 sets, the new limit will apply across all types of business sets which can be provisioned in table KSETINV.

It should also be noted that this feature does not increase the number of equivalent DN appearances (or virtual lines<sup>11</sup>) which can be supported on these Business Sets. Please see Section 1.6, “Interactions”, on page 1419 for further details.

## 1.6 Interactions

Every P-phone provisioned in table KSETINV takes up one line card slot on the line peripheral (or node). In the case of IP Clients, the line peripheral is represented by a Logical Group that is provisioned in table LGRPINV.

Each peripheral or Logical Group maps to a single node which can support up to 1024 lines. In addition, virtual nodes are required to support the DN appearances provisioned on Business Sets in table KSETLINE as well as certain features provisioned in table KSETFEAT. These virtual nodes can support up to 2050 equivalent DN appearances (or virtual lines). The number of virtual nodes required therefore depends on the configuration of the business sets.

As an example, 150 thousand IP Clients provisioned in table KSETINV would require at least 150 Logical Group nodes. Assuming an average of 4 equivalent DN appearances per Business Set, then an additional 300 virtual nodes would be required ( $150K \times 4 = 300 \times 2K$ ).

Strictly from a node perspective these numbers can be supported without any additional development in the Core. Up to 1024 line peripherals (or Logical Groups) can be defined in an office of which up to 944 can be virtual. The 150 thousand IP Clients would therefore require 150 Logical Groups, leaving 874 nodes available for virtual lines.

---

11. One virtual lines is required for each DN appearance as well as services such as Call Waiting, Ring Again and certain programming features.

## 1.7 Glossary

| Term    | Description               |
|---------|---------------------------|
| CICM    | Centrex IP Client Manager |
| KSETINV | Key-set Inventory         |

## 2: Configuration for A00007790

### 2.1 Hardware and Software Requirements

Not applicable.

### 2.2 Initial Configuration

Not applicable.

### 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

Not applicable.

### 2.4 Upgrade Considerations

Not applicable.

### 2.5 Data schema (DS) (CM, MIBS, RDB)

#### 2.5.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/OLD/UNCHANGED) |
|----------------|--------------------------|-----------------------------------|
| KSETINV        | changed                  | new                               |

#### 2.5.2 Table/MIB/Remote Database Schema information

##### 2.5.2.1 Name: KSETINV

Business Set and Data Unit Inventory Table

##### 2.5.2.1.1 Functional description

No change.

##### 2.5.2.1.2 Usage sequence and implications (CM Only)

No change.



### 2.5.2.1.3 Size

Table 2 Table size

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                             |
|------------------------|----------------|----------------|---------------------------------------------------|
| KSETINV                | 0              | 150,000        | Memory is automatically allocated for this table. |

### 2.5.2.1.4 Fields/OIDs

### 2.5.2.1.5 Datafill example

### 2.5.2.1.6 Table release history update

The maximum table size is increased from 31,743 to 150,000.

### 2.5.2.1.7 Supplementary information

### 2.5.2.1.8 Translation verification and other tools

## 2.6 Service Orders (SO) (CM & SESM)

Not applicable.

## 2.7 Software optionality control (SOC)

Not applicable.

## 2.8 Element Management

Not applicable.

## 2.9 User interface changes

Not applicable.

## 2.10 OSSGate Interface Changes

Not applicable.

## 2.11 Security

Not applicable.

## 2.12 Configuration Walkthrough

## ***Product = CS 2000***

### **A00007934--E800 Routing Enhancements**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

DMS, PT-AAL2

#### **1.2 Introduction**

Enhanced 800 (E800) is a U.S. service currently available in the DMS software. E800 service provides the ability to route toll-free 8XX (e.g. 800) calls in a telecommunications network. The 8XX numbers must be mapped to a specific directory number and can be carried by either the Local Exchange Carrier (LEC) or a specific Inter-Exchange Carrier (IEC). When an 8XX call is originated, a database query is performed using the Transaction Capabilities Application Part (TCAP) layer of the Signaling System 7 (SS7) protocol. The database contains a mapping of 8XX numbers to routing directory numbers. Additionally, the database identifies the IEC to handle the call (when applicable). This information is returned in an E800 Response to the switch that initiated the query. The returned information is used by the switch for translations and routing.

Currently, the DMS100/CS2000 End Office (EO) switch provides two methods for translating an E800 Response:

1. Translate using the Standard Pretranslator (STDPRT) name of the originating subscriber.
2. Translate using the STDPRT name provisioned for option PRETRAN in table NSCDEFS. With this option, all E800 Response translations use a single STDPRT subtable.

With the first method, the STDPRT name of the originating subscriber is used when performing the E800 Response translation. However, this method may cause interaction issues with other datafill in the originating subscriber's STDPRT subtable. For example, if the STDPRT subtable contains datafill to route toll calls to treatment (i.e. toll denied), the E800 Response translation may route to treatment in error.

The second method was introduced as a provisioning alternative to avoid interactions with datafill in the originating subscriber's STDPRT subtable. With the second method, a single STDPRT name is provisioned via option PRETRAN in table NSCDEFS. This STDPRT name provides an *override* to the originator's STDPRT name and is used for translating all E800 Responses.

However, with routing provided via a single STDPRT subtable, all E800 Response translations are limited to a single set of routes<sup>12</sup>.

This activity provides additional flexibility for E800 Response translations by supporting *multiple* STDPRT names as an *override* to the originator's STDPRT name. With the support of multiple STDPRT names, a DMS100/CS2000 EO switch can be configured with multiple routes<sup>13</sup>. This flexibility is provided with the introduction of new option PRETRANMAP in table NSCDEFS and the introduction of new table NSCPMAP. Table NSCPMAP provides a method to *override* or *map* the originating subscriber's STDPRT name with a new STDPRT name.

A new Software Optionality Control (SOC): NTS00030, "E800 Pretran Mapping" is created for this activity. This SOC has an RTU of A/P (Always Present), and it is always at ON state. New option PRETRANMAP, in table NSCDEFS, always takes precedence over existing option PRETRAN since SOC NTS00030 is always set to ON.

## 1.3 Description

The combination of new table NSCPMAP and new option PRETRANMAP (in table NSCDEFS) provides the flexibility to support multiple STDPRT names for E800 Response translations.

Table NSCPMAP is introduced to provide a mapping from the originator's STDPRT name to a new STDPRT name for use by the E800 Response translation. By providing a mapping on a per originating subscriber's STDPRT name basis, E800 terminating routes can be (indirectly) configured on a per-originating subscriber basis.

New option PRETRANMAP is added to table NSCDEFS as a provisioning trigger for activating a lookup in new table NSCPMAP. In addition, new option PRETRANMAP provides equivalent functionality to the existing NSCDEF's option PRETRAN. This is accomplished by adding fields CALLS and IGNORE<sup>14</sup> to option PRETRANMAP.

The following sections provide a detailed description for this new capability.

### 1.3.1 New Table NSCPMAP

New table NSCPMAP provides the ability to override the originating subscriber's STDPRT name with a new STDPRT name for the E800 Response

---

12. This restriction applies when the routing is performed from the STDPRT subtable. E800 calls that complete to the IEC are routed from the STDPRT subtable.

13. Applies when routing is performed from subtable STDPRT. E800 calls that complete to the IEC are routed from the STDPRT subtable.

14. Existing option PRETRAN in table NSCDEFS consists of fields CALLS and IGNORE.

translation. Table NSCPMAP is accessed when new option PRETRANMAP is provisioned in table NSCDEFS.

Refer to Table 1 on page 1424 for a description of table NSCPMAP. The key field, **ORIGPTNM**, is the originating subscriber's STDPRT name. This STDPRT name is *mapped* to the new STDPRT name that is provisioned for field **MAPPTNM**. The *mapped* STDPRT name is used for the E800 Response translation. Note that neither key ORIGPTNM or field MAPPTNM can be provisioned with the nil pretranslator name - "NPRT". Table control will enforce this restriction.

**Table 1: New Table NSCPMAP**

| Key & Field    | Values             | Comments                                                                               |
|----------------|--------------------|----------------------------------------------------------------------------------------|
| Key: ORIGPTNM  | PRETRANSLATOR_NAME | The table key specifies the originating subscriber's STDPRT name.                      |
| Field: MAPPTNM | PRETRANSLATOR_NAME | This field specifies the new STDPRT name to be used for the E800 Response translation. |

The functionality provided by table NSCPMAP is not activated until option PRETRANMAP is provisioned in table NSCDEFS.

Following is a provisioning example for new table NSCPMAP:

|                       |         |
|-----------------------|---------|
| <u>TABLE: NSCPMAP</u> |         |
| ORIGPTNM              | MAPPTNM |
| -----                 |         |
| P819                  | P800    |

### 1.3.2 New Option PRETRANMAP, Table NSCDEFS

To enable the functionality provided by this activity, new option PRETRANMAP must be provisioned in table NSCDEFS. Option PRETRANMAP consists of three fields as shown in Table 2 on page 1425.

**Table 2: Table NSCDEFS, New Option PRETRANMAP**

| New Option | Subfields         | Comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PRETRANMAP | DEFPREXLA         | Specifies the default STDPRT name that is to be used if no entry is found in table NSCPMAP.<br>When provisioned to NPRT and no entry is found in table NSCPMAP, the originating subscriber's STDPRT name is used.<br><br>If option PRETRAN already exists in table NSCDEFS, consideration should be given to provisioning option PRETRANMAP with the same <i>values</i> as existing option PRETRAN. By provisioning the same <i>values</i> , the switch behavior is unchanged from option PRETRAN for those STDPRT names that are not provisioned in table NSCPMAP. |
|            | CALLS {ALL, COIN} | Specifies whether ALL calls or only COIN calls should use this functionality.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|            | IGNORE {Y/N}      | Specifies whether this option should be ignored for the AIN or LNP Response translation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

Option PRETRANMAP provides equivalent functionality to existing option PRETRAN by supporting subfields CALLS and IGNORE. Additionally, a DEFPREXLA field is provided which specifies the default STDPRT name to be used in the event an entry is not found in table NSCPMAP. By provisioning a default STDPRT name, only exception cases need to be provisioned in table NSCPMAP.

An added capability provided by option PRETRANMAP is the ability to use the originator's STDPRT name, rather than a default STDPRT name, in the event an entry is not found in table NSCPMAP. This is accomplished by provisioning NPRT for subfield DEFPREXLA.

An added capability provided by option PRETRANMAP is the ability to use the originator's STDPRT name, rather than a default STDPRT name, in the event an entry is not found in table NSCPMAP. This is accomplished by provisioning NPRT for subfield DEFPREXLA.

Following is a provisioning example for new option PRETRANMAP in table NSCDEFS:

| <u>TABLE: NSCDEFS</u> |         |                            |
|-----------------------|---------|----------------------------|
| NSCCODE               | TIMEOUT | OPTIONS                    |
| -----                 |         |                            |
| E800                  | 3       | (PRETRANMAP PDEF ALL N) \$ |

Existing Option PRETRAN Considerations:

New option PRETRANMAP can be configured to function identical to existing option PRETRAN in table NSCDEFS. This is accomplished by provisioning option PRETRANMAP with the same values that are provisioned for existing option PRETRAN and by not adding STDPRT names in table NSCPMAP.

If existing option PRETRAN functionality is required with the exception of those STDPRT names provisioned in table NSCPMAP, new option PRETRANMAP should be provisioned with the same values as existing option PRETRAN. In this case, new option PRETRANMAP will provide equivalent functionality to existing option PRETRAN with the exception of those STDPRT names provisioned in table NSCPMAP.

### 1.3.3 New SOC NTS00030

SOC NTS00030, “E800 Pretran Mapping” is added by this activity. This SOC is always at ON state and does not control the feature functionality. This SOC has an RTU of A/P (Always Present) and the state cannot be changed to IDLE.

Note SOC NTS00030 requires SOC NTS00005, “E800-US”.

New option PRETRANMAP in table NSCDEFS controls both the call processing and Traver enhancements provided by this activity (refer to sections “Call Processing” on page 1427 and “Traver” on page 1430).

### 1.3.4 Recommended Provisioning Procedure for PRETRANMAP

The following provisioning procedure is recommended:

1. Add the required STDPRT name tuples to table NSCPMAP.
2. For the E800 service, add new option PRETRANMAP in table NSCDEFS. Do not immediately remove option PRETRAN if it is currently provisioned. Once option PRETRANMAP is added, the new functionality is active and option PRETRAN is no longer referenced by the switch software.

If option PRETRAN is currently provisioned in table NSCDEFS, consideration should be given to provisioning option PRETRANMAP

with the same *values* as existing option PRETRAN. By provisioning the same *values*, the switch behavior is unchanged from option PRETRAN for those STDPRT names that are not provisioned in table NSCPMAP.

To revert back to the functionality provided by existing option PRETRAN, option PRETRANMAP should be removed from table NSCDEFS. Option PRETRAN (if previously provisioned) must still be present in table NSCDEFS to revert back.

Once the switch is properly configured to use option PRETRANMAP and table NSCPMAP, existing option PRETRAN can optionally be removed from table NSCDEFS. Removal of option PRETRAN is not mandatory.

### 1.3.5 Call Processing

The DMS100/CS2000 EO call processing software is enhanced to use the new functionality provided by option PRETRANMAP and table NSCPMAP. Figures 1, 2 and 3 provide flow charts of the enhanced call processing behavior. The call processing software enhancements are active only when option PRETRANMAP is provisioned in table NSCDEFS.

Note that figure 2 depicts the switch behavior when an E800 Query is performed on a call and a non-IEC routing number is returned from the E800 database. The E800 Response translation subsequently hits an AIN or LNP trigger resulting in a query to the AIN/LNP database. The IGNORE subfield for option PRETRANMAP specifies whether the AIN/LNP Response translation should ignore the PRETRANMAP option and use the originating subscriber's pretranslator.

Figure 1 E800 Response Translation

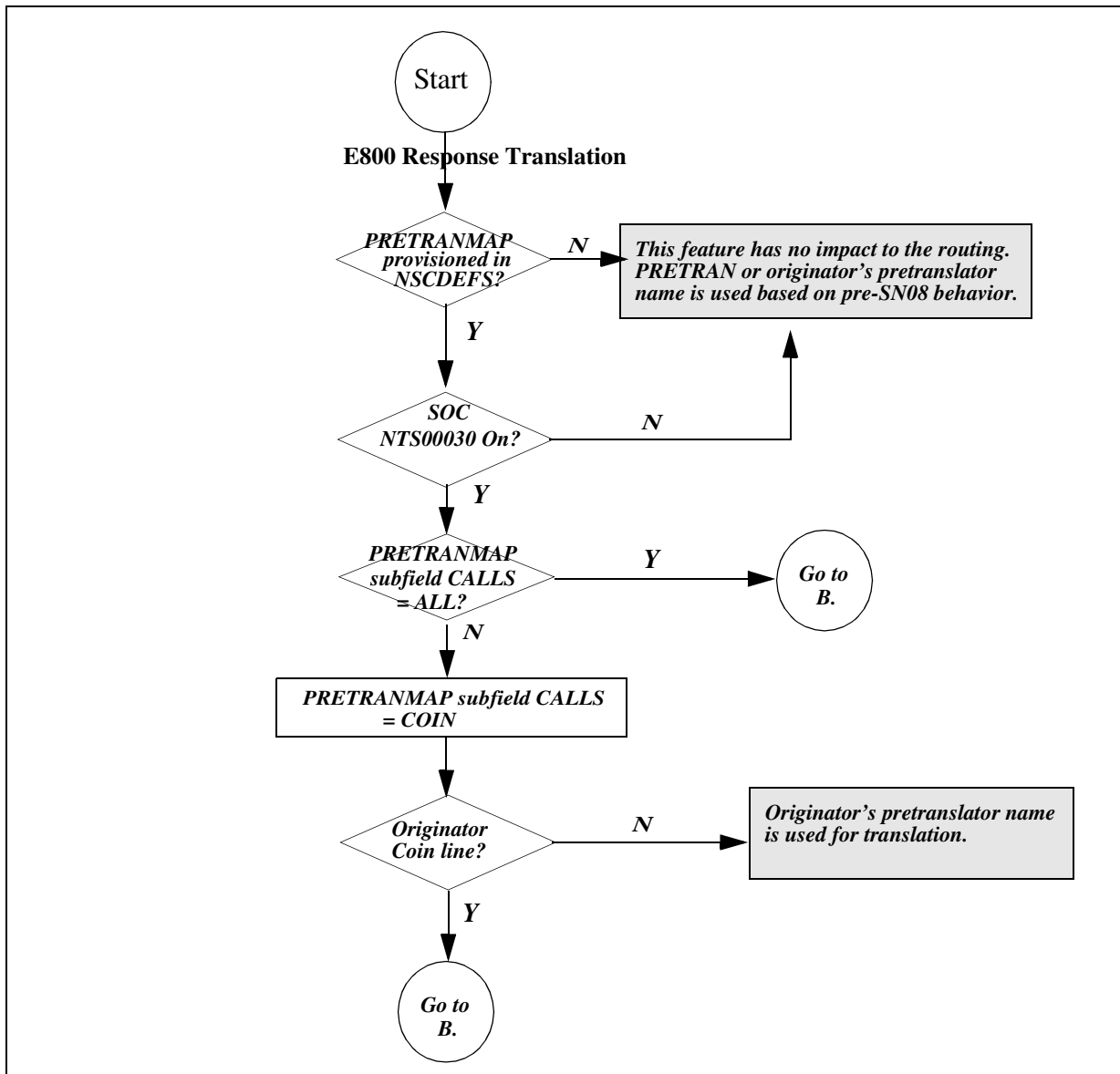




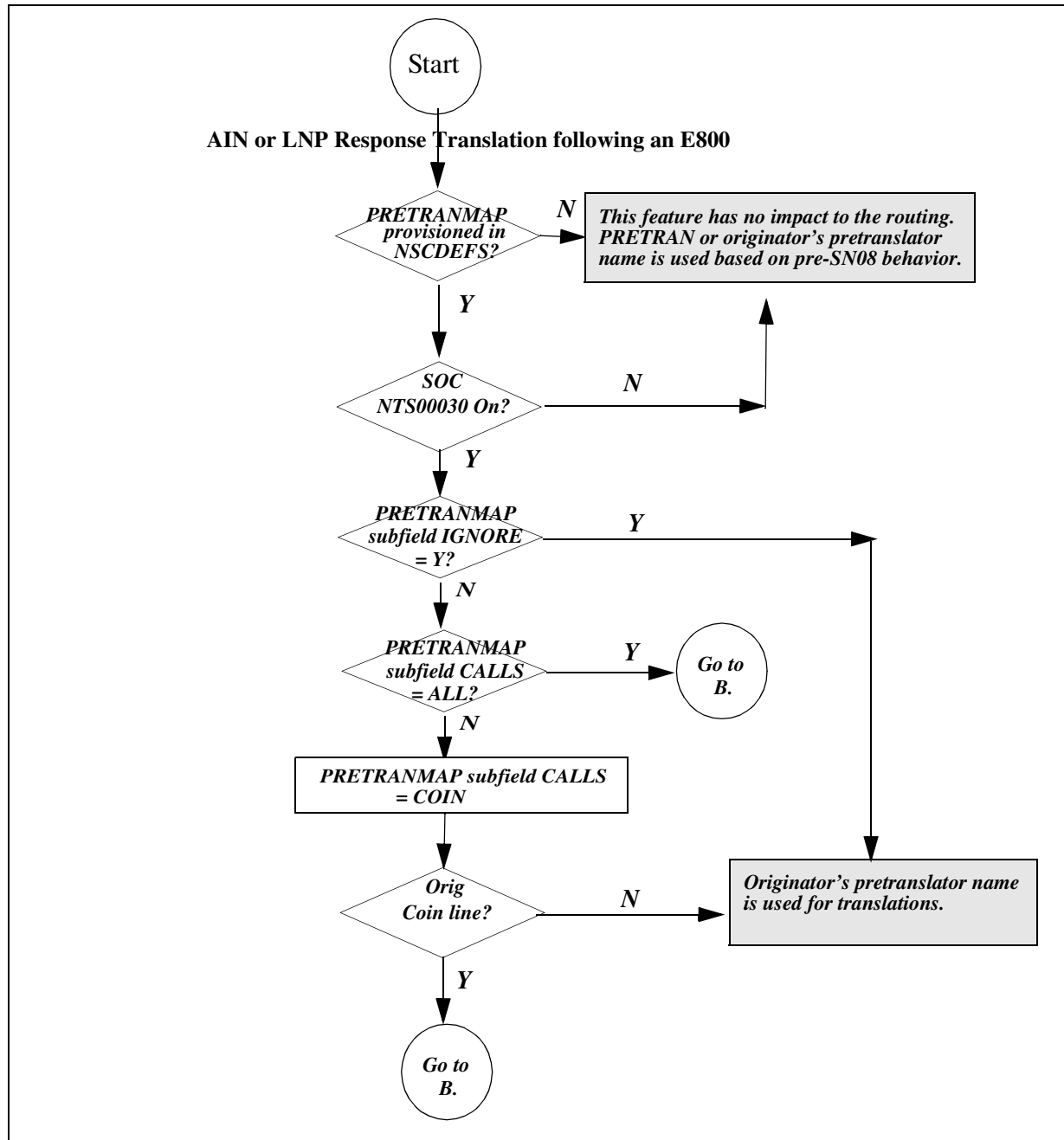
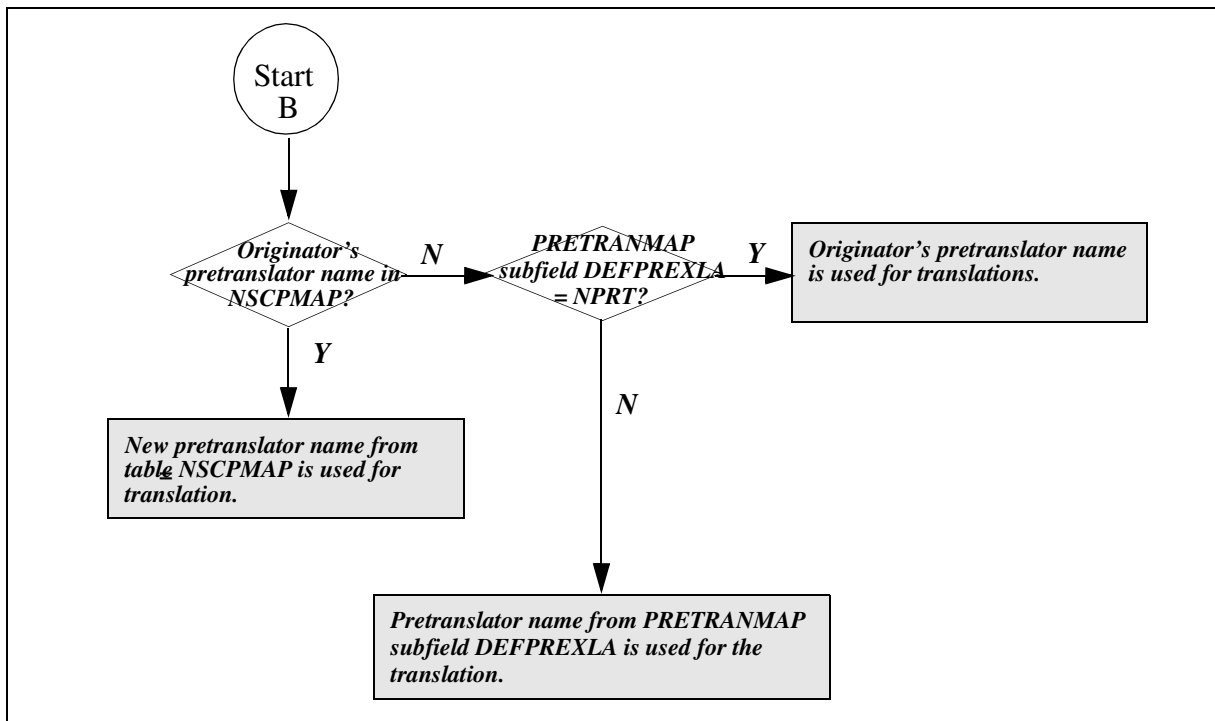
**Figure 2 AIN/LNP Response Translation following an E800 Query**

**Figure 3 Response Translation - Part 2**

### 1.3.6 Traver

The DMS100/CS2000 EO Traver software is enhanced to support the display of new option PRETRANMAP in table NSCDEFS and to display the contents of new table NSCPMAP. The existing “NSC” Traver command line option must be input in order to see the new Traver enhancements. The Traver enhancements are active only when option PRETRANMAP is provisioned in table NSCDEFS.

The following set of figures provide examples of the modified Traver output.

**Figure 4 PRETRANMAP:CALLS set to ALL, entry in NSCPMAP**

```

traver l 6215000 nsc 101022215198881111 b

TABLE LINEATTR
0 1FR NONE NT 0 10 NILSFC 0 NIL NIL 00 613_P621_0 L613_LATA1_0 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
613_P621_0 FR01 613 P621 TSPS Y RESGRP 0 2 $ $
TABLE RATEAREA
L613_LATA1_0 L613 NIL LATA1 $
TABLE DNATTRS
613 621 5000
(PUBLIC ( NAME SAM_SNEAD) $)$ $
TABLE DNGRPS
TUPLE NOT FOUND
TABLE LENFEAT
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP LNPOFFICE
TABLE NSCDEFS
E800 3 (4DGTIC ) (PRETRANMAP PDEF ALL Y) $
TABLE NSCPMAP
P621 P800
USING PRETRANSLATOR FROM TABLE NSCPMAP
TABLE STDPRCT
P800 ( 1) ( 0) 4
. SUBTABLE STDPRCT
. 1010222 1010222 EA DD 7 P PCAR CAR1 Y OFRT 700 8 25 N
. . TABLE OFRT
. . 700 S D ISUP2WATC
. . EXIT TABLE OFRT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE STDPRCT
PCAR ( 1) ( 0) 6
. SUBTABLE STDPRCT
. 15 19 EA DD 1 T NA CAR1 N
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
613 Y 915 2 ( 74) ( 1) ( 0) ( 0) 2 $
. SUBTABLE HNPACODE
. 519 519 FNPA 0

```

(traver for figure 2 continued)

TABLE FNPACONT

519 10 - ( 2 ) ( 0 ) ( 1 ) ( 0 )

. SUBTABLE FNPACODE

. 888 888 3 Y

. SUBTABLE RTEREF

. . 3 N D ISUPIT 0 N N

. EXIT TABLE RTEREF

EXIT TABLE FNPACONT

LNP Info: Called DN is not resident.

LNP Info: HNPA results are used.

TABLE LCASCRCN

613 L613 ( 56 ) OPTL N N Y

. SUBTABLE LCASCR

. TUPLE NOT FOUND. DEFAULT IS NON-LOCAL

TABLE PFXTREAT

TUPLE NOT FOUND. DEFAULT IS TO LEAVE XLA RESULT UNCHANGED

TABLE CLSVSCRC

KEY NOT FOUND

EA:Local override does not apply to this call.

TABLE LATA XLA

LATA1 51 INTER INTER STD

TABLE OCCINFO

CAR1 0222 TRANS Y Y Y Y N N Y Y Y Y LONG 0 FGRPD N N N N N N N Y N N N N Y

TABLE EASAC

TUPLE NOT FOUND

OVERLAP CARRIER SELECTION (OCS) DOES NOT APPLY - AIN\_OFFICE\_TRIGGRP DEFINED

Using Equal Access (EA) route OFRT 700 from Pretranslation

TABLE OFRT

700 S D ISUP2WATC

EXIT TABLE OFRT

TABLE TRIGGRP

LNPOFFICE INFOANAL

. PODP ( DG PODPDIG ) \$ NIL

Trigger AIN PODP is applicable to office.

. LNP ( DG LNPDIG ) ( ESCEA ) ( ESCOP ) ( ESCDN ) ( ESCCN DD ) \$ NIL

Trigger AIN LNP is applicable to office.

AIN Info Analyzed TDP: trigger criteria not met.

+++ TRAVER: SUCCESSFUL CALL TRACE +++

DIGIT TRANSLATION ROUTES

1 ISUP2WATC 5198881111 ST

TREATMENT ROUTES. TREATMENT IS: GNCT

1 T120

**Figure 5 PRETRANMAP:CALLS set to ALL, no entry in NSCPMAP, default in NSCDEFS**

traver l 6215000 nsc 101022215198881111 b

```
TABLE LINEATTR
0 1FR NONE NT 0 10 NILSFC 0 NIL NIL 00 613_P621_0 L613_LATA1_0 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
613_P621_0 FR01 613 P621 TSPS Y RESGRP 0 2 $ $
TABLE RATEAREA
L613_LATA1_0 L613 NIL LATA1 $
TABLE DNATTRS
613 621 5000
(PUBLIC ( NAME SAM_SNEAD) )$ $
TABLE DNGRPS
TUPLE NOT FOUND
TABLE LENFEAT
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP LNPOFFICE
TABLE NSCDEFS
E800 3 (4DGTIC ) (PRETRANMAP PDEF ALL Y) $
TABLE NSCPMAP
TUPLE NOT FOUND
USING PRETRANSLATOR FROM TABLE NSCDEFS
TABLE STDPRTCT
PDEF ( 1) ( 0) 4
. SUBTABLE STDPRT
. 1010222 1010222 EA DD 7 P PCAR CAR1 Y OFRT 700 8 25 N
. . TABLE OFRT
. . 700 S D ISUP2WATC
. . EXIT TABLE OFRT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE STDPRTCT
PCAR ( 1) ( 0) 6
. SUBTABLE STDPRT
. 15 19 EA DD 1 T NA CAR1 N
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
613 Y 915 2 ( 74) ( 1) ( 0) ( 0) 2 $
. SUBTABLE HNPACODE
. 519 519 FNPA 0
```

*(remainder of traver is the same as figure 2)*

**Figure 6 PRETRANMAP:CALLS set to ALL, no entry in NSCPMAP, NPRT in NSCDEFS**

**traver l 6215000 nsc 101022215198881111 b**

```
TABLE LINEATTR
0 1FR NONE NT 0 10 NILSFC 0 NIL NIL 00 613_P621_0 L613_LATA1_0 $
LCABILL OFF - BILLING DONE ON BASIS OF CALLTYPE
TABLE XLAPLAN
613_P621_0 FR01 613 P621 TSPS Y RESGRP 0 2 $ $
TABLE RATEAREA
L613_LATA1_0 L613 NIL LATA1 $
TABLE DNATTRS
613 621 5000
(PUBLIC ( NAME SAM_SNEAD) $)$ $
TABLE DNGRPS
TUPLE NOT FOUND
TABLE LENFEAT
TUPLE NOT FOUND
TABLE OFCVAR
AIN_OFFICE_TRIGGRP LNPOFFICE
TABLE NSCDEFS
E800 3 (4DGTIC ) (PRETRANMAP NPRT ALL Y) $
TABLE NSCPMAP
TUPLE NOT FOUND
USING PRETRANSLATOR FROM TABLE XLAPLAN
TABLE STDPRTCT
P621 ( 1) ( 0) 4
. SUBTABLE STDPRT
. 1010222 1010222 EA DD 7 P PCAR CAR1 Y OFRT 700 8 25 N
. . TABLE OFRT
. . 700 S D ISUP2WATC
. . EXIT TABLE OFRT
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE STDPRTCT
PCAR ( 1) ( 0) 6
. SUBTABLE STDPRT
. 15 19 EA DD 1 T NA CAR1 N
. SUBTABLE AMAPRT
. KEY NOT FOUND
. DEFAULT VALUE IS: NONE OVRNONE N
TABLE HPCPATTN
TUPLE NOT FOUND
TABLE HNPACONT
613 Y 915 2 ( 74) ( 1) ( 0) ( 0) 2 $
. SUBTABLE HNPACODE
. 519 519 FNPA 0
```

*(remainder of traver is the same as figure 2)*

## 1.4 Hardware Requirements or Dependencies

Not applicable.

## 1.5 Software Requirements or Dependencies

New SOC NTS00030, “E800 Pretran Mapping”, is added by this activity. NTS00030 requires existing SOC NTS00005 - “E800-US”.

## 1.6 Limitations and restrictions

The following limitations and restrictions apply:

- E800 is the only service supported by this activity.  
The 800P and E008 services are not supported with option PRETRANMAP in table NSCDEFS<sup>15</sup>. Table control restrictions are added to table NSCDEFS to prevent the PRETRANMAP option from being provisioned for a service other than E800.
- AIN Toll Free Service is not enhanced by this activity.
- Only the DMS100/CS2000 EO E800 software is enhanced by this activity. The DMS200 E800 software is not enhanced.
- NPRT (nil pretranslator name) can not be provisioned in table NSCPMAP. Table control enforces this restriction.
- This feature does not support Attendant Consoles.
- The NSC option of TRAVER is not supported for PRI, PX, and MF/SS7 IBN trunks originating agents.
- The NSC option of TRAVER is not supported by AIN and LNP response translations.

## 1.7 Interactions

The following interactions apply:

- When option PRETRANMAP is provisioned in table NSCDEFS, existing option PRETRAN is no longer referenced by the switch software.

Existing option PRETRAN and new option PRETRANMAP can co-exist in table NSCDEFS. This is permitted to support a transition from existing option PRETRAN to new option PRETRANMAP.

- If a redirection service (e.g. CFW) is encountered which results in an E800 Query and Response transaction, the STDPRT name of the redirecting agent is used to perform the lookup in table NSCPMAP.

---

15. Note the 800P and E008 services are currently not supported with existing option PRETRAN in table NSCDEFS.

- Using AIN it is possible to alter the translation through table XLAMAP and table PXLAMAP. Either the pretranslator name or the LINEATTR index can be altered. In the event AIN returns an 800 routing number resulting in a subsequent E800 TCAP Query, the interaction with new option PRETRANMAP is dependent on whether the previous AIN translation specified a new pretranslator name or a new LINEATTR index:

If the previous AIN translation specified a new pretranslator name, the E800 response translation uses the originating subscriber's pretranslator<sup>16</sup>. The new PRETRANMAP option is consistent with this behavior. If option PRETRANMAP is provisioned, the originating subscriber's pretranslator is used to perform a lookup in table NSCPMAP.

If the previous AIN translation specified a new LINEATTR index, the E800 response translation uses the pretranslator name associated with the new LINEATTR<sup>17</sup>. The new PRETRANMAP option is consistent with this behavior. If option PRETRANMAP is provisioned, the pretranslator associated with the new LINEATTR index is used to perform a lookup in table NSCPMAP.

AIN should not be configured to use a shared LINEATTR index for two (or more) groups of subscribers if the subsequent E800 translation requires a unique pretranslator for each group of subscribers. The mapping provided by table NSCPMAP uses the pretranslator name associated with the shared LINEATTR index. The shared LINEATTR index can only be mapped to a single pretranslator using table NSCPMAP.

## 1.8 Glossary

| Term   | Description                  |
|--------|------------------------------|
| 800P   | 800 Plus                     |
| AIN    | Advanced Intelligent Network |
| CFW    | Call Forwarding              |
| CS2000 | Call Server 2000             |
| DMS100 | Digital Multiplex System 100 |
| DMS200 | Digital Multiplex System 200 |
| E008   | Enhanced 008                 |
| E800   | Enhanced 800                 |
| EO     | End Office                   |

16. Applicable when neither the PRETRAN or PRETRANMAP option is used.

17. Applicable when neither the PRETRAN or PRETRANMAP option is used.



| Term   | Description                               |
|--------|-------------------------------------------|
| IEC    | Inter-Exchange Carrier                    |
| LEC    | Local Exchange Carrier                    |
| LNP    | Local Number Portability                  |
| NPRT   | Nil Pretranslator                         |
| SOC    | Software Optionality Control              |
| NSC    | Number Services Code                      |
| SS7    | Signaling System Number 7                 |
| STDPRT | Standard Pretranslator                    |
| TCAP   | Transaction Capabilities Application Part |

## ***Product = CS 2000***

### **A00008350--Trunk group OM registers for establish bearer path failures**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

#### **1.2 Description**

This activity provides an enhancement to the per call failure handling in the CS2K Core by providing new OM registers. These registers will be pegged on a per-trunk group basis when the AUDT106 logs are generated. If throttling of logs is in effect resulting in suppression of AUDT106 logs, these OM registers will continue to be pegged to maintain an accurate count of the failures.

This activity addresses the following:

1. Creating new OM registers in the existing TRK/TRNK2, TRK2NET1/TRK2NET2 OM Groups
2. Pegging the new OM registers

OSS needs to be updated for these additional registers.

### 1.2.1 Creating new OM registers in TRK/TRNK2 OM Groups

The AUDT106 log is generated when a call is forced down by the release of a trunk. Prior to this activity, customers relied on counting the number of AUDT106 logs in order to determine the impact to connecting offices (via trunks) of call failures.

This activity introduces a new register MIDFAIL at the end of the existing registers of the TRK OM group. This register will provide established bearer path failure counts on a per-trunk group basis.

| OM Group Name | NEW, CHANGED or DELETED | Reason                          |
|---------------|-------------------------|---------------------------------|
| TRK           | Changed                 | A new register MIDFAIL is added |

Another register MIDFAIL2 will be introduced in the TRNK2 OM group. This is the extension register of MIDFAIL.

| OM Group Name | NEW, CHANGED or DELETED | Reason                           |
|---------------|-------------------------|----------------------------------|
| TRNK2         | Changed                 | A new register MIDFAIL2 is added |

The snapshot after the addition looks as below.

**Figure 1 TRK OM Group**

TRK

CLASS: ACTIVE

START:2004/10/06 04:25:00 WED; STOP: 2004/10/06 04:25:33 WED;

SLOWSAMPLES: 1 ; FASTSAMPLES: 3 ;

KEY (COMMON\_LANGUAGE\_NAME)

INFO (OM2TRKINFO)

|          |          |         |                |
|----------|----------|---------|----------------|
| INCATOT  | PRERTEAB | INFAIL  | NATTMPT        |
| NOVFLATB | GLARE    | OUTFAIL | DEFLDCA        |
| DREU     | PREU     | TRU     | SBU            |
| MBU      | OUTMTCHF | CONNECT | TANDEM         |
| AOF      | ANF      | TOTU    | ANSWER         |
| INVAUTH  | BLKCTRK  | MAXBU   | TRU2WIN        |
| NCTPASS  | NCTFAIL  | ACCCONG | NOANSWER       |
| NPQUERY  | NPRESP   | NPBDRTF | <b>MIDFAIL</b> |

51 DALI

IC 0 0

|   |   |   |          |
|---|---|---|----------|
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | <b>0</b> |

52 VTOA2WATC0

2W 0 0

|   |   |   |          |
|---|---|---|----------|
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | 0        |
| 0 | 0 | 0 | <b>0</b> |

**Figure 2 TRNK2 OM Group**

```

TRNK2

CLASS: ACTIVE
START:2004/10/06 04:30:00 WED; STOP: 2004/10/06 04:34:07 WED;
SLOWSAMPLES:      3 ; FASTSAMPLES:      25 ;

      KEY (COMMON_LANGUAGE_NAME)
      INFO (OM2TRKINFO)
      INCATOT2  NATTMPT2  DEFLDCA2  TRU2
      SBU2      CONNECT2  TANDEM2  TOTU2
      ANSWER2   TRU2WIN2  MIDFAIL2

51 DALI
IC      0      0
          0      0      0      0
          0      0      0      0
          0      0      0      0

52 VTOA2WATC0
2W      0      0
          0      0      0      0
          0      0      0      0
          0      0      0      0

53 VER90
OG      0      0
          0      0      0      0
          0      0      0      0
          0      0      0      0

```

### 1.2.2 Creating new OM registers in TRK2NET1/TRK2NET2 OM Groups

The OM groups TRK2NET1/TRK2NET2 were introduced as part of the Trimodal Logs and OM activity.

This activity introduces a new register MIDFAIL3 at the end of the existing registers of the TRK2NET1 OM group. This register will provide established bearer path failure counts on a per bearer network per-trunk group basis.

Another register MIDFAIL4 will be introduced in the TRK2NET2 OM group. This is the extension register of MIDFAIL3.

| OM Group Name | NEW, CHANGED or DELETED | Reason                           |
|---------------|-------------------------|----------------------------------|
| TRK2NET2      | Changed                 | A new register MIDFAIL4 is added |

**Note:** The OMSHOW command would display the OM groups and its fields. However the tuples of the TRK2NET1 OM group or any Trimodal OM groups are not displayed unless the MULTINET\_DISPLAY\_ACTIVE parameter in the table OFCVAR is set to 'Y'.

The snapshot after the addition looks as below.

**Figure 3 TRK2NET1 OM Group**

TRK2NET1

CLASS: ACTIVE

START:2004/10/06 04:35:00 WED; STOP: 2004/10/06 04:36:37 WED;

SLOWSAMPLES: 1 ; FASTSAMPLES: 10 ;

INFO (TRK2NET1\_INFO)

|         |                 |          |         |
|---------|-----------------|----------|---------|
| INCAATT | PRERTEA1        | NINFAIL  | NATMPT  |
| NVFLATB | GLARE1          | OUTFL    | TRFCU   |
| SBSYU   | MBSYU           | TRKNWBLK | CNCTAT  |
| TNDMATT | ANIOFCFL        | NANF     | TOTBSYU |
| NANSWER | INVATHCD        | MAXBSY   | NACCCNG |
| NOANSWR | <b>MIDFAIL3</b> |          |         |

0

|     |       |      |     |    |   |          |
|-----|-------|------|-----|----|---|----------|
| TTT | NET 0 | ENET | 100 | OG | 3 | 1        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | <b>0</b> |
| 0   |       | 0    |     |    |   |          |

1

|     |       |      |     |    |   |          |
|-----|-------|------|-----|----|---|----------|
| TTT | NET 1 | A1_P | 100 | OG | 0 | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | 0        |
| 0   |       | 0    |     | 0  |   | <b>0</b> |
| 0   |       | 0    |     |    |   |          |

**Figure 4 TRK2NET2 OM Group**

```

TRK2NET2

CLASS: ACTIVE
START:2004/10/06 04:35:00 WED; STOP: 2004/10/06 04:39:48 WED;
SLOWSAMPLES:      3 ; FASTSAMPLES:      29 ;

      INFO (TRK2NET1_INFO)
      INCAATT2      NATMPT2      TRFCU2      SBSYU2
      CNCTAT2      TNDMATT2      TOTBSYU2      NANSWER2
      MIDFAIL4

0
      TTT NET 0 ENET  100 OG      3      1
      0          0          0          0
      0          0          0          0
      0

1
      TTT NET 1 A1_P  100 OG      0      0
      0          0          0          0
      0          0          0          0
      0

2
      TTT NET 2 A1_S  100 OG      0      0
      0          0          0          0
      0          0          0          0
      0

```

**Note:** Office parameter OFFICETYPE in table OFCSTD controls the generation of the registers for these OM Groups. These new registers will be included in all supported office types as defined for each of the OM groups.

### 1.2.3 Pegging the new OM register

The OM registers MIDFAIL and MIDFAIL3 will be pegged from the same location where the AUDT106 logs are generated irrespective of whether the throttle occurs or not.

## 1.3 Hardware Requirements or Dependencies

None

## 1.4 Software Requirements or Dependencies

None

## 1.5 Limitations and restrictions

None

## 1.6 Glossary

| Term | Description              |
|------|--------------------------|
| OM   | Operational Measurements |
| CS2K | Call Server 2000         |

## 1.7 References

A00003487 - Trimodal Provisioning, Logs and OMs.

A00006777 - GWC Core LOGs for call failures.

NTP 297-8021-814; North American DMS-100; Operational Measurements Reference Manual

NN 10264-709; Succession Performance Management Operational Measurements Reference

***Product = CS 2000***

## **A89007819--QoS Reporting: QoS Collector Application (QCA)** ***Functional Description***

### 1.1 Applicable Solution(s)

PT-IP, IAW, IAC

## 1.2 Description

This document covers the QoS Collector Application functionality supported in SN08 time frame.

In Voice over IP networks, Quality of Service (QoS) can be adversely affected by the components in the network. Unlike TDM networks where the voice quality is consistent for all calls, VoIP networks can experience different voice quality on all calls.

The common parameters that make up voice quality are;

- Packets sent
- Packets received
- Packet loss
- Octets sent
- Octets received
- Inter-arrival latency
- Jitter

All gateways beginning SN06 VoIP solutions will report these statistics via end-of-call reporting mechanisms specific to the protocol used for MGC - VMG communication.

It is the purpose of this activity is to design a method for reporting these QoS parameters on a per call basis for the purposes of;

- Network engineering
- Trend analysis
- Trouble-shooting network problems
- SLA validation

This is accomplished by implementing a reporting mechanism that will allow QoS reports (as IPDR records) to be delivered to a customer provided OSS for processing. In order to achieve SLA validation, QoS reports are correlated to appropriate billing records so that the QoS of billed calls can be determined.

QoS Reporting is applicable for more than just VoIP networks. It can be used in ATM and hybrid networks as well. In the SN06 time frame, however, QoS Reporting will be limited to pure IP networks which consist only of GWC driven GWs. Support for SPM peripherals and hybrid networks will be accomplished in a later release.

The proposed architecture for QoS Reporting in SN06 consists of the following components;



1. QoS Correlation ID and billing
2. QoS Reporting Application (on GWC)
3. Provisioning
4. QoS Report collection
5. QoS Report processing

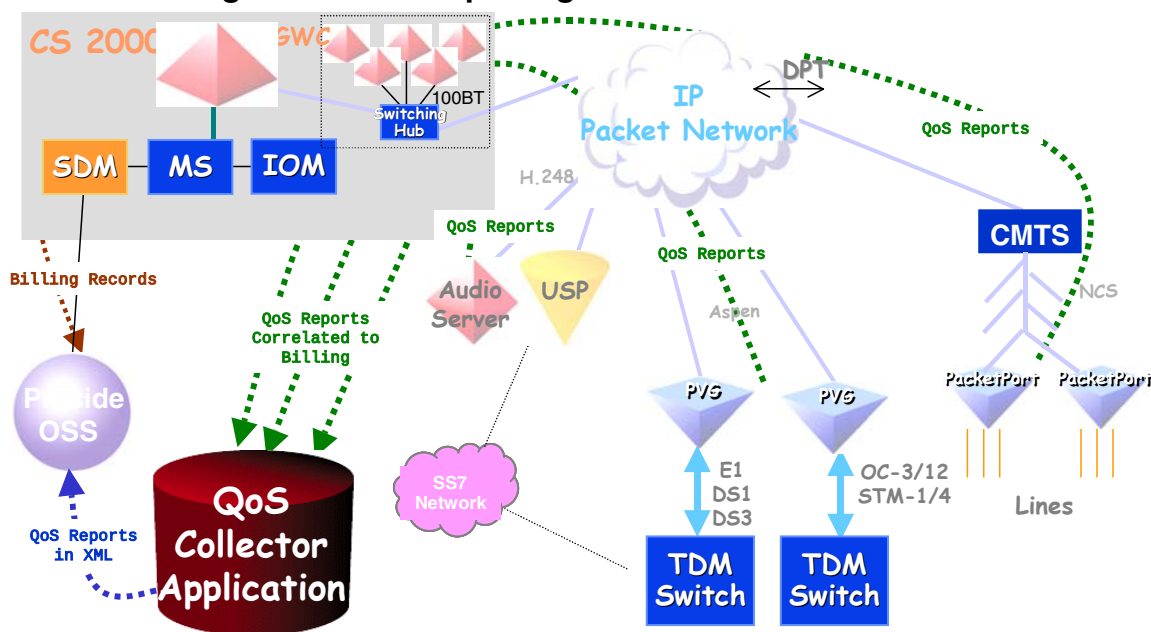
This activity implements component 4. QoS Report collection, the QoS Collector Application (QCA).

### 1.2.1 System behavior

All QoS (IPDR) records are stored on a QoS Collector Application (QCA) host. The QCA will receive binary QoS records from the GWCs, converts these to QCA IPDR records and stores them in a file. The QCA IPDR records can be obtained by the OSS for processing.

The configuration of this proposal is shown in Figure 1, "QoS Reporting in a VoIP Network".

**Figure 1 QoS Reporting in a VoIP Network**



### 1.2.2 Configuration

The configuration details for the QoS Collector Application are provided by a properties file. The properties file is located at `/opt/nortel/qca/properties/qca.properties` and can be configured by the user.

The QCA properties are given in Table 1, "QCA properties," on page 1446 and an example QCA properties file is given in Figure 2, "Example of the QCA properties file".

**Table 1 QCA properties**

| Name                               | Description                                                           | Units   | Range          | default |
|------------------------------------|-----------------------------------------------------------------------|---------|----------------|---------|
| portNumber <sup>3</sup>            | the port number the QCA accepts connections on                        | N/A     | 20000 to 20004 | 20000   |
| MaxFileSize                        | maximum size of an output file                                        | MBytes  | 1 to 100       | 1       |
| MaxFileTime                        | interval output file is open                                          | minutes | 1 to 240       | 15      |
| RetainFileTime                     | how long the output files should be retained                          | days    | 1 to 30        | 5       |
| recycleToD                         | the hour in the day the directories will be recycled                  | hour    | 0 to 23        | 0       |
| fileExt                            | the output file extension                                             | N/A     | String         | xml     |
| nodeName                           | the node name to be used in the output files                          | N/A     | String         | QCA     |
| closedFileCompression <sup>1</sup> | whether the file should be compressed when closed and moved to today  | boolean | true or false  | true    |
| oldFileCompression <sup>1,2</sup>  | whether the files should be compressed at the first directory recycle | boolean | true or false  | true    |

Notes:

1. File compression may be required as there is limited disk space for QCA IPDR record storage.
2. If *closedFileCompression* is true the value of the *oldFileCompression* property is negated as the files will have already been compressed.
3. A range of port numbers is provided for flexibility. The main use is for upgrade purposes, where two QCA instance may be running on a single host. Multiple QCAs, and therefore port numbers, should not be used to segregate QCA traffic.

The qca.properties file is read when the QCA is started, therefore the QCA must be stopped and restarted for changes in the qca.properties to be picked up.

When the qca.properties file is read the contents is validated. If any of the properties are not present or invalid, the default value is automatically used. A

warning customer log is generated to indicate that the default value is being used.

An example customer log warning:

```
Oct 11 12:00:02 wmdhs0j8 main:0001 QCA001 WARNING init label:  
RetainFileTime property in properties/qca.properties is out of  
range. QCA is starting with default retain file time of 5 days
```

**Figure 2 Example of the QCA properties file**

```
# QCA Properties file
# The QCA will have to be restarted for changes in the properties
# file to be reflected in the application's operation

# The maximum size of a file, in MBytes, before it is closed
# Range is 1 to 100. Default is 1.
MaxFileSize=1

# The maximum time, in minutes, a file can be open before
# it is closed
# Range is 1 to 240. Default is 15.
MaxFileTime=15

# Hour of the day that the directory structure is recycled
# Range 0 (12:00 AM) to 23 (11:00 PM). Default is 0 (12:00 AM).
# Do NOT specify minutes.
recycleToD=0

# port number to start application on.
# Range is 20000 to 20004. Default is 20000.
portNumber=20000

# How long, in days, the files are kept before deleting
# VERY IMPORTANT: Depending on the call volume and the number of
# days for file retention it could be possible to exhaust all
# available disk space, therefore the value of this property
# should be considered in great depth. If QCA is started with
# the value of this property less than the number of today
# directories for a given port the older directories will be
# deleted.
# Range 1 to 30. Default is 5.
RetainFileTime=5

# File Extension used in the QCA output file name.
# Default is xml.
fileExt=xml

# Node name to be used in the QCA output file name.
# Default is QCA.
nodeName=QCA

# true or false value indicating whether the output file
# should be compressed when closed. Default is true.
closedFileCompression=true

# true or false value indicating whether the file should be
# compressed at the first directory recycle
# Note: If closedFileCompression is true the value of the
# oldFileCompression property is negated as the files will have
```

### 1.2.3 Starting QCA

The `qca_server` script is used to start the QCA. The user should log in as root to execute this script.

When the `qca_server` script is run the following warning is displayed:

Attempting to register QCA as Qca with PMFADM.

If a QCA instance has not already been started with `qca_server` the following message is displayed:

```
Registration as Qca was ok. QCA started.
```

If a QCA instance has already been started with `qca_server` the following message is displayed:

```
pmfadm: Request "Qca" already queued
Could not register QCA as Qca with PMFADM, this suggests a QCA
instance is already running.
```

When the QCA is started the following steps are performed:

- the QCA is registered with PMFADM (processes monitor facility administration).
- This is a Solaris utility that monitors register processes and restarts the process if no longer running.
- configuration details (`qca.properties` file) are read
- If any of the properties information is not present or is invalid the default value is used and a customer log is generated to indicate this. It is at this point the user can stop the QCA if using default values is not acceptable.
- the QCA attempts to open a server socket on the specified port.
- If the specified port is in use the QCA can not be started.
- a file management process is started
- If the QCA output directory is not available when the QCA is started the directories are created.
- If a file exists in the active output directory, this indicates that QCA did not stop gracefully, the QCA will attempt to complete the file and move it to the today directory.
- the QCA waits for connections from clients (GWCs and SPMs) on the port number specified in the `qca.properties`.

### 1.2.4 Stopping QCA

The `stop_qca` script is used to stop the QCA. The user should log in as root to execute this script.

When the `stop_qca` script is run the following warning is displayed:

```
Are you sure you want to stop the QCA? Have you checked the port
number in qca.properties? [no or yes]
```

If the port number in `qca.properties` has been checked and is correctly specified for the QCA to be stopped, this should be validated against the QCA datafill in PTM, then **yes** should be entered, otherwise **no** should be entered and the port number checked.

If a QCA instance was started by `qca_server` the following message will be displayed:

```
Attempting to unregister QCA as Qca from PMFADM.  
Attempting to stop local QCA on port: 20001  
QCA stopped successfully.
```

If a QCA was not started by `qca_server` the following message will be displayed:

```
Attempting to unregister QCA as Qca from PMFADM.  
pmfadm: "Qca" No such <nametag> registered  
  
QCA not registered with PMFADM as Qca, so stop_qca aborted.
```

If the above message is seen the `query_qca` script should be used to determine if a QCA instance is running on the host.

When the QCA is stopped the following steps are performed, in order:

- the QCA is unregistered with PMFADM
- the QCA stops accepting connections from clients
- the connection to the client(s) is closed
- the IPDR / XML structure in the output file is closed
- the output file is closed and moved to the today directory

**Note:** to avoid alarms being generated by all the GWCs sending QoS records to the QCA when the QCA is stopped, the QCA details must be removed from PTM first. Please refer to activity 89007781 - QoS Reporting: Provisioning for QoS Reporting provisioning details.

### 1.2.5 Client (GWC) connection to QCA

When the QoS reporting mechanism is started on a client (GWC) it will connect to the QCA as specified in PTM, e.g. IP Address and port.

When a connection is established the QCA waits to receive data from the client (GWC).

### 1.2.6 Client (GWC) Connection heart beat

The TCP/IP connection between the client and QCA will be automatically closed if it is not used for more than 2 hours. To ensure the connection is not closed in this circumstance, the client will send a 'heart beat' message after 2 hours of inactivity.

The QCA simply receives the client ‘heart beat’, and does not generate a QCA IPDR record.

## 1.2.7 QCA File Management

The active output file is in the active directory. When a file is closed it is moved to the today directory.

### 1.2.7.1 Initialization

When the QCA is started the following file management steps are performed:

- the output directories are created if they do not already exist.
- any files in the active output directory are validated, ensuring that the last IPDR is complete and that the file structure is closed. Once the file is complete it is moved to the today output directory.
- all ‘today’ directories older than the file retention period are deleted. This can occur if the qca.properties is change such that file retention period is reduced.
- a new file is created using the naming convention given below. If the file name already exists the new file will have the number 0 added before the file extension, if this exists, the number 1 will be used, then 2 and so on.

### 1.2.7.2 Output directory

The directory used for the current QCA output is:

/data/qca/”port number”/output/active

*Note:* In SN08, QCA registers with the ‘servman’<sup>18</sup> on the SSPFS machine. Depending on your selection of `RetainFileTime` property in qca.properties file and your calculation of Disk consumption depending on Call traffic at your CO, proper disk partition size of /data/qca should be requested during SSPFS installation. For calculation on how much disk space should be allocated, refer to section 2.2.7.5.

Where “port number” is the port number that is specified in qca.properties and that the QCA accepts connections on. This allows the output of two QCAs running on the same host to be distinguished.

### 1.2.7.3 File names

The QCA will use the following file naming convention:

<Node Type>.<Node  
Name>.<ReportName>.Year.Mon.Date\_HR.MN\_<TZ>.<File Ext>

---

18. servman is the application service manager on the SSPFS platform starting SN06.2. servman manages registration and de registration of all client applications running on the SSPFS machine whether it is simplex or clustered.

For example:

QCA.Telco\_Switch\_35.QoS.2002.04.11\_02.45\_EDT.xml

Where each of the elements is described as:

**<NodeType>** - A Nortel defined string identifying the product origination. Always "QCA".

**<Node Name>** - This name should MATCH the name of the node that is used in faults, in configuration (FQDN), in accounting and in GUIs. This value is configurable as property nodeName in qca.properties.

**<Report Name>** - The name of the script/filter/report that is used to create this file. There may be 1 or more report names in operation for a given NE simultaneously. Each report type must be identified in the filename. Always "QoS"

**<Year.Mon.Date\_HR.MN\_>** - This field when present in the active directory refers to the time when the file was opened or created in the active directory. The same field when present in today directories refers to the time the file was closed i.e the time when the files are closed and recycled to the today directories.

**<TZ>** - This is the Time Zone of the NE the Performance data is being collected from. This can be an off set from UMT or GMT.

**<File Ext>** - The file extension specified in qca.properties or the default xml.

#### 1.2.7.4 Output file rotation (closure)

QCA file management provides file rotation (closure) based on file size and time the file has been open, on a 'which ever comes first' basis. These values are MaxFileSize and MaxFileTime, respectively, in qca.properties.

#### 1.2.7.5 Output file compression

Due to the size of each QCA IPDR record (maximum about 840 bytes) the required disk space to store several days of QCA output files could be very large.

The required disk space storage requirement calculation is as follows:

Assuming:

- BHCA = 550K
- Calls per day = 10 x BHCA = 5.5 M
- QoS records per day = 2 x Calls per day = 11 M
- Record size = 840-bytes



- Compression ratio = 88% (achieved in testing)

Per day disk space required = 11 M x 840 = 8.6 GBytes

When using compression = 8.6 GBytes \* 0.12 = 1 GByte

It can be seen that file compression offers a major saving in disk space requirements. And without compression the disk space in the /data/qca partition would be quickly exhausted.

The file compression is controlled by two properties, `closedFileCompression` and `oldFileCompression`.

`closedFileCompression` controls whether the active file should be compressed when it is closed and moved to the today directory.

`oldFileCompression` controls whether the retained files should be compressed when the output directories are recycled. When `oldFileCompression` is enabled, the files in the today-n directories will be checked, and compressed if required, every time directory recycling occurs.

#### 1.2.7.6 Output file retention

The file management of the QCA follows that implemented for the SN05 feature SNMP Performance Measurement Poller (59039902). The output directory structures will contain a *number* of directories, for the current active file, today's closed files and the last *number-1* days closed files.

The clean-up mechanism is described by two parameters:

'retain file duration' (`RetainFileTime`) - how long (in days) should the files be retained on the local disk.

'recycle time of day' (`recycleToD`) - the hour of the day that the today directories are recycled.

Both are parameters specified in the `qca.properties` file read when the QCA is started.

At a predefined time (`recycleToD` in `qca.properties`, default is 12:00 AM), the output directories will be recycled.

The today-n directories are not created when the QCA is started but when the output files are recycled.

When the today directory reaches the maximum file retention period the information is discarded.

E.g. Output file structure if *number* were 30:

```
/data/qca/"port number"/output/active  
/data/qca/"port number"/output/today  
/data/qca/"port number"/output/today-1  
/data/qca/"port number"/output/today-2  
.  
/data/qca/"port number"/output/today-28  
/data/qca/"port number"/output/today-29
```

**Note:** if the QCA is stopped and restarted with a new 'retain file duration', that is less than the previous 'retain file duration' the QCA operated with, any existing today directories older than the new 'retain file duration' will be deleted.

The value for the 'retain file duration' should be considered carefully as the operation of the QCA and other applications may be impacted if there is no free disk space because it is used to store QCA output files.

In arriving at a value for the 'retain file duration' the following should be considered:

- the BHCA and total number of calls per day.
- total disk space available for file retention
- whether file compression is used.

A similar calculation to that in section 2.2.7.5 'Output file compression' should be used to determine the required 'per day' disk space requirements and therefore the 'retain file duration', e.g.:

$$\text{'retain file duration'} = \frac{\text{available disk space in MBytes}}{\text{required MBytes/day}}$$

Suppose the /data/QCA partition size is 8GBytes. Using the assumptions in section 2.2.7.5 'Output file compression' and the above calculation the maximum 'retain file duration' value is:

$$\frac{8000 \text{ MBytes}}{1000 \text{ MBytes}} = 8 \text{ days}$$

However, you may request a higher partition size of /data/qca during SSPFS installation as per the calculation shown in section 2.2.7.5.

### 1.2.7.7 Reporting disk space issues

As the QCA operates, disk space in /data/qca is used for the active file and to retain closed files. If the disk space in /data/qca becomes exhausted this would

effect the operation of the QCA. The QCA uses customer logs to report disk space issues before all the space is used to reduce the possibility of completely filling the partition.

Every time the QCA creates a new file it will attempt check the available disk space, in the unlikely event that available space is not determinable the QCA will write a debug log to a file.

The QCA determines the number of free bytes available in the /data/qca partition and compares this with 3 boundary values; 1 GByte, 500 MBytes and 100 MBytes.

### **1 GByte boundary**

If the available disk space is greater than 1 GByte then no further action is taken. However, if the available disk space is less than 1Gb and more than 500Mb, a minor customer log/alarm is generated.

If some disk space is made available in the /data/qca partition, after a customer alarm was raised, to make the available disk space great than 1GByte, the QCA raises a clear customer log for the minor alarm when the next new file is created.

However, if no action is taken and the available space still lies with between 1 GByte and 500 MBytes when the next file is created, the QCA will generate another minor customer log/alarm.

### **500 MByte boundary**

If the available disk space is less than 500 MBytes and more than 100 MBytes, a major customer log/alarm is generated

If the available disk space goes above 500 MBytes, but below 1 GByte, the QCA raises a clear customer log for the major customer log/alarm when the next new file is created.

If the available disk space goes above 1 GByte the QCA raises clear customer logs for both the major and minor customer logs/alarms when the next new file is created.

However, if no action is taken and the available space still lies with between 500 MBytes and 100 MBytes when the next file is created, the QCA will generate another major customer log/alarm.

### **100 MByte boundary**

If the available disk space is less than 100 MBytes a critical customer log/alarm is generated

If the available disk space goes above 100 MBytes, but below 500 MBytes, the QCA raises a clear customer log for the critical customer log/alarm when the next new file is created.

If the available disk space goes above 500 MBytes, but below 1 GByte, the QCA raises clear customer logs for both the critical and major customer logs/alarms when the next new file is created.

If the available disk space goes above 1 GByte, the QCA raises clear customer logs for the critical, major and minor customer logs/alarms when the next new file is created.

However, if no action is taken and the disk space is completely exhausted the QCA will generate a critical customer log/alarm and the QCA will be stopped.

In the scenario where write access is prevented the application will raise a critical customer log/alarm and the QCA will be stopped.

### 1.2.8 Growing the Size of /data/qca

See Appendix B for the Procedure to grow the size of Partition /data/qca.

### 1.2.9 QoS record processing

At the end of every call the client reports the QoS statistics to the QCA in a binary QoS record. The QCA validates the record, ensuring the record sequence number, version and length are correct. The QCA then converts the record to an IPDR form. The QCA IPDR record is then written to a file.

#### 1.2.9.1 Binary QoS record format

The QoS record sent from the client (GWC) is a binary message. A description of the binary QoS record fields is shown in Table 2, "Binary QoS record fields," on page 1456.

**Table 2 Binary QoS record fields**

| Name             | Description                                              | Range                            |
|------------------|----------------------------------------------------------|----------------------------------|
| MT (MGC Type)    | The type of client (MGC) the QoS record was generated by | 0 - GWC<br>1 - SPM               |
| Msg Type         | Message type                                             | 0 - QoS record<br>1 - heart beat |
| Sequence number  | Record sequence number                                   | 0 to 16777215                    |
| RT (Report Type) | Report Type                                              | 0 - local<br>1 - remote          |
| ver (version)    | The QoS record version                                   | 0 to 15                          |

**Table 2 Binary QoS record fields**

| Name                | Description                                                                      | Range                    |
|---------------------|----------------------------------------------------------------------------------|--------------------------|
| MGC number          | The number of the client (MGC) the QoS record was generated by                   | 0 to 255                 |
| Msg length          | The length of the message (including header)                                     | 0 to 255 (should be 130) |
| Gateway port number | The port number on the Gateway used in the call                                  | 0 to 65535               |
| Gateway IP Address  | The IP Address of the Gateway used in the call                                   | 4-bytes                  |
| Gateway FQDN        | Consists of two separate fields; the Gateway name and the endpoint               | 64-bytes                 |
| Switch CLLI         | The CLLI of the CS2K the client is subtended to                                  | 16-bytes                 |
| Correlation ID      | The correlation id that can be used to correlate the QoS record to an AMA record | 10-bytes                 |
| Packets Sent        | The total number of packets transmitted                                          | 0 to 2147483647          |
| Packets Received    | The total number of packets received                                             | 0 to 2147483647          |
| Octets Sent         | The total number of payload octets transmitted                                   | 0 to 2147483647          |
| Octets Received     | The total number of payload octets received                                      | 0 to 2147483647          |
| Packets Lost        | The total number of packets lost                                                 | 0 to 2147483647          |
| Jitter              | Estimate of packet interarrival time (milliseconds)                              | 0 to 32676               |
| Latency             | Estimate of network latency (milliseconds)                                       | 0 to 32676               |

**1.2.9.2 QCA IPDR record format**

The output of the QCA is a single stream (file) of IPDR Version 3.1-A.0.2 compliant records.

**1.2.9.2.1 QCA IPDR elements**

The IPDR elements used in the QoS output format are shown in Table 3, “QCA IPDR tags,” on page 1457.

**Table 3 QCA IPDR tags**

| QoS Field Tag      | Type     | Range                                                          |
|--------------------|----------|----------------------------------------------------------------|
| StartTime          | dateTime | ISO 8601 format.                                               |
| EndTime            | dateTime | ISO 8601 format.                                               |
| timeZoneOffset     | integer  | Time offset, in minutes, of local time zone referenced to GMT. |
| callCompletionCode | String   | Final call completion code for billing use.                    |

**Table 3 QCA IPDR tags**

| QoS Field Tag          | Type    | Range                             |
|------------------------|---------|-----------------------------------|
| originalDestinationId  | String  | Called-party (designation) number |
| hostName               | String  | 0 to 22 characters                |
| subscriberId           | String  | 0 to 65 characters                |
| uniqueCallId           | String  | 20 hexadecimal digits             |
| ipAddress              | String  | 7 to 15 numerical characters      |
| portNumber             | String  | 0 to 65535                        |
| seqNum                 | integer | 0 to 16777215                     |
| averagePacketLatency   | integer | 0 to 32676                        |
| inboundByteCount       | integer | 0 to 2147483647                   |
| outboundByteCount      | integer | 0 to 2147483647                   |
| inboundPacketCount     | integer | 0 to 2147483647                   |
| outboundPacketCount    | integer | 0 to 2147483647                   |
| inboundLostPacketCount | integer | 0 to 2147483647                   |
| packetDelayVariation   | integer | 0 to 32676                        |

An example QCA IPDR record:

```

<IPDR>
<StartTime>1970-01-01T00:00:00.000Z</StartTime>
<EndTime>1970-01-01T00:00:00.000Z</EndTime>
<timeZoneOffset>0</timeZoneOffset>
<callCompletionCode>CC</callCompletionCode>
<originalDestinationId></originalDestinationId>
<hostName>GWC3@COMITIP</hostName>
<subscriberId>aaln/1@http018.mgsite-2.b4sky.ott</subscriberId>
<uniqueCallId>43c01738000f13e30d05</uniqueCallId>
<ipAddress>10.0.15.1</ipAddress>
<portNumber>2427</portNumber>
<seqNum>18</seqNum>
<averagePacketLatency>0</averagePacketLatency>
<inboundByteCount>41538</inboundByteCount>
<outboundByteCount>0</outboundByteCount>
<inboundPacketCount>301</inboundPacketCount>
<outboundPacketCount>0</outboundPacketCount>
<inboundLostPacketCount>0</inboundLostPacketCount>
<packetDelayVariation>0</packetDelayVariation>
</IPDR>

```

The maximum size of a QCA IPDR record is around 840 characters, this equates to 840-bytes (using UTF-8 encoding).

Not all of the QoS statistics are provided by all media gateways, e.g. in SN06 the UAS does not support the Jitter and Latency statistics, therefore if the received binary QoS record does not contain a valid value for any of the QoS statistics the element will not be included in the output QCA IPDR record.

### 1.2.9.3 QCA IPDR element values

See Table 4, “Mapping of input binary QoS Record fields to output QCA IPDR record elements,” on page 1459.

**Table 4 Mapping of input binary QoS Record fields to output QCA IPDR record elements**

| Output QCA IPDR elements | Input Binary QoS field                                         | Comment                                                                                                                                   |
|--------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| StartTime                | N/A                                                            | Not applicable. Hardcoded value used: 1970-01-01T00:00:00.000Z                                                                            |
| EndTime                  | N/A                                                            | Not applicable. Hardcoded value used: 1970-01-01T00:00:00.000Z                                                                            |
| timeZoneOffset           | N/A                                                            | Not applicable. Hardcoded value used: 0                                                                                                   |
| callCompletionCode       | N/A                                                            | Not applicable. Hardcoded value used: CC (call completed normally)                                                                        |
| originalDestinationId    | N/A                                                            | Not applicable. Empty String                                                                                                              |
| subscriberId             | Concatenation of Endpoint and Gateway Name (from Gateway FQDN) | <EndPoint>@<GW Name>                                                                                                                      |
| hostName                 | Concatenation of MT (MGC Type), MGC Number and Switch CLLI     | <MGC Type><MGC Number>@<Switch CLLI>                                                                                                      |
| uniqueCallId             | Correlation Id                                                 |                                                                                                                                           |
| ipAddr                   | Gateway IP Address                                             | standard 4-part format                                                                                                                    |
| portNumber               | Gateway Port Number                                            |                                                                                                                                           |
| seqNum                   | Sequence number                                                |                                                                                                                                           |
| averagePacketLatency     | Latency                                                        | Element not present in IPDR if the received binary QoS record value is less than 0, indicating that the GW did not support the statistic. |
| inboundByteCount         | Octets Received                                                |                                                                                                                                           |
| outboundByteCount        | Octets Sent                                                    |                                                                                                                                           |
| inboundPacketCount       | Packets Received                                               |                                                                                                                                           |
| outboundPacketCount      | Packets Sent                                                   |                                                                                                                                           |
| inboundLostPacketCount   | Packet Loss                                                    |                                                                                                                                           |
| packetDelayVariation     | Jitter                                                         |                                                                                                                                           |

The following elements are 'required' IPDR elements so have been included in the QCA output for IPDR compliancy.

- StartTime
- EndTime
- timeZoneOffset
- CallCompletionCode
- originalDestinationId

#### 1.2.9.4 QCA IPDR file format

The output of the QCA is a file with format conforming to the IPDR structure. The first line in the file is the header, providing details about the XML version and encoding. The next line is the 'open' IPDR tag which gives information about the version of QCA and indicates the start of records. The last line in the file is the 'close' IPDR tag which indicates the end of the file.

Please see Figure 3, "QCA IPDR file format" for an example QoS XML file format.

**Figure 3 QCA IPDR file format**

| Line no. | Line                                                                                                                                                                                                                                                  | Description                    |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1        | <?xml version="1.0" encoding="UTF-8" ?>                                                                                                                                                                                                               | File header                    |
| 2        | <IPDRDoc xmlns="http://www.ipdr.org/namespaces/ipdr" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" IPDRRecorderInfo ="qca.nortelnetworks.com" xsi:schemaLocation="http://www.ipdr.org/namespaces/ipdr VoIP3.1-A.0.2.xsd" version="3.1-A.0.2"> | IPDRDoc is the file open tag   |
| 3        | <IPDR>                                                                                                                                                                                                                                                | Start of record                |
|          | .                                                                                                                                                                                                                                                     |                                |
|          | .                                                                                                                                                                                                                                                     |                                |
|          | .                                                                                                                                                                                                                                                     |                                |
|          | .                                                                                                                                                                                                                                                     |                                |
|          | .                                                                                                                                                                                                                                                     |                                |
| n-1      | </IPDR>                                                                                                                                                                                                                                               | End of record                  |
| n        | </IPDRDoc>                                                                                                                                                                                                                                            | /IPDRDoc is the file close tag |



The IPDRDoc tag gives information about the IPDR format used and the device that generated the IPDR file, e.g.

IPDRRecorderInfo = "qca.nortelnetworks.com"

### 1.2.10 Detecting Events and Errors

In the situation that the QCA detects an event (e.g. client closes the connection) or an error (e.g. out of sequence record), a customer log is generated and an error IPDR record is written to the output file.

The error IPDR record is generated so that the OSS does not require two interfaces to the QCA host, one to retrieve IPDR records and one to monitor events and errors. All the relevant information to the QCA output processing is provided in the single output stream.

The error IPDR record is compliant to the IPDR specification, i.e. contains all of the required IPDR elements, some of which will contain default or empty values.

#### Multiple errors

This is only applicable to unsupported QoS record version and unsupported QoS record length errors.

The QCA allows up to 9 consecutive unsupported QoS record version and up to 9 consecutive unsupported QoS record length errors. When the 10th consecutive error is detected a customer log is generated to indicate this and the connection is being closed.

If a client sends a QoS record with valid length or version before sending 10 unsupported QoS record version or 10 unsupported QoS record length records, a customer log is generated to indicate that the alarm condition has been cleared.

**Table 5 QCA Error and Event actions**

| Error/Event                                                       | QCA Action                                                                           |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| out of sequence record                                            | customer log generated<br>error IPDR record generated<br>binary QoS record processed |
| unsupported QoS record version (less than 10 consecutive records) | customer log generated<br>error IPDR record generated<br>binary QoS record discarded |

**Table 5 QCA Error and Event actions**

| Error/Event                                                      | QCA Action                                                                                                |
|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| unsupported QoS record version (10th consecutive records)        | customer log generated<br>error IPDR record generated<br>binary QoS record discarded<br>connection closed |
| unsupported QoS record length (less than 10 consecutive records) | customer log generated<br>error IPDR record generated<br>binary QoS record discarded                      |
| unsupported QoS record length (10th consecutive records)         | customer log generated<br>error IPDR record generated<br>binary QoS record discarded<br>connection closed |
| unknown message type                                             | customer log generated<br>error IPDR record generated<br>binary QoS record discarded<br>connection closed |
| unable to read binary QoS record header                          | customer log generated<br>error IPDR record generated<br>binary QoS record discarded<br>connection closed |
| unable to process binary QoS record body                         | customer log generated<br>error IPDR record generated<br>binary QoS record discarded                      |
| connection closed (not by QCA) <sup>a</sup>                      | customer log generated<br>error IPDR record generated<br>connection closed (from QCA end)                 |
| QCA stopped                                                      | customer log generated<br>error IPDR record generated                                                     |
| QCA started                                                      | error IPDR record generated                                                                               |
| New GWC Connection                                               | customer log generated<br>error IPDR record generated                                                     |

a. Note: This includes the 'GWC Swact' scenario.

**Note:** please refer to Appendix A for more details of the customer logs generated by the QCA.

#### 1.2.10.1 QCA Error IPDR record

Depending on the type of error, different information can be used in the error IPDR record.

For example, if a message with an ‘unknown message type’ is received the whole message is unreliable so only the connection information can be used. Whereas, if an ‘out of sequence’ record is received the message format is valid so information from the connection and record header can be used.

Default values are used in the QCA error IPDR record for the following required IPDR elements:

- StartTime - 1970-01-01T00:00:00.000Z
- EndTime - 1970-01-01T00:00:00.000Z
- callCompletionCode - CC
- originalDestinationId - empty string
- subscriberId - empty string
- uniqueCallId - empty string

Depending on the type of error or event the following QCA error IPDR record elements may contain information:

- hostName - MGC Id, if the MGC Id is not available it is an empty string and the Node name (the value of the nodeName property in the qca.properties file). Below are some examples.
  - GWC3@CS2K\_LAB (if MGC Id is available)
  - CS2K\_LAB (if MGC Id is an empty string)
- seqNum - the sequence number of the QoS record with the error, the sequence number is not available it is 0

The following QCA error IPDR record elements are always used to convey information:

- ipAddress
- portNumber
- proprietaryErrorCode

The values for each element in the error IPDR record, other than the default elements, is given in Table 6, “Error IPDR record elements,” on page 1464.

**Table 6 Error IPDR record elements**

| <b>Error/Event</b>                                          | <b>Element</b>       | <b>Value</b>                                                                                                       |
|-------------------------------------------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------|
| Unexpected Record Sequence Number                           | hostname             | MGC Id, Node name                                                                                                  |
|                                                             | seqNum               | record sequence number                                                                                             |
|                                                             | ipAddress            | IP Address of connection                                                                                           |
|                                                             | portNumber           | Port number of connection                                                                                          |
|                                                             | proprietaryErrorCode | 0 (plus previous valid record sequence number, e.g. previous sequence number = 1638, proprietaryErrorCode = 01638) |
| Record Lost: Unsupported Version                            | hostname             | MGC Id, Node name                                                                                                  |
|                                                             | seqNum               | record sequence number                                                                                             |
|                                                             | ipAddress            | IP Address of connection                                                                                           |
|                                                             | portNumber           | Port number of connection                                                                                          |
|                                                             | proprietaryErrorCode | 1                                                                                                                  |
| Record Lost: Unsupported Record Length                      | hostname             | MGC Id, Node name                                                                                                  |
|                                                             | seqNum               | record sequence number                                                                                             |
|                                                             | ipAddress            | IP Address of connection                                                                                           |
|                                                             | portNumber           | Port number of connection                                                                                          |
|                                                             | proprietaryErrorCode | 2                                                                                                                  |
| Connection closed: Unrecognised Message Type                | hostname             | Node name                                                                                                          |
|                                                             | seqNum               | 0                                                                                                                  |
|                                                             | ipAddress            | IP Address of connection                                                                                           |
|                                                             | portNumber           | Port number of connection                                                                                          |
|                                                             | proprietaryErrorCode | 3                                                                                                                  |
| Connection closed: Error while processing QoS record header | hostname             | Node name                                                                                                          |
|                                                             | seqNum               | 0                                                                                                                  |
|                                                             | ipAddress            | IP Address of connection                                                                                           |
|                                                             | portNumber           | Port number of connection                                                                                          |
|                                                             | proprietaryErrorCode | 4                                                                                                                  |

**Table 6 Error IPDR record elements**

| Error/Event                                         | Element              | Value                     |
|-----------------------------------------------------|----------------------|---------------------------|
| Record Lost: Error while processing binary QoS data | hostname             | MGC Id, Node name         |
|                                                     | seqNum               | 0                         |
|                                                     | ipAddress            | IP Address of connection  |
|                                                     | portNumber           | Port number of connection |
|                                                     | proprietaryErrorCode | 5                         |
| Connection closed                                   | hostname             | Node name                 |
|                                                     | seqNum               | 0                         |
|                                                     | ipAddress            | IP Address of connection  |
|                                                     | portNumber           | Port number of connection |
|                                                     | proprietaryErrorCode | 6                         |
| QCA Stopped                                         | hostname             | Node name                 |
|                                                     | seqNum               | 0                         |
|                                                     | ipAddress            | IP Address of connection  |
|                                                     | portNumber           | Port number of connection |
|                                                     | proprietaryErrorCode | 7                         |
| QCA Started                                         | hostname             | Node name                 |
|                                                     | seqNum               | 0                         |
|                                                     | ipAddress            | IP Address of connection  |
|                                                     | portNumber           | Port number of connection |
|                                                     | proprietaryErrorCode | 8                         |
| New GWC Connection <sup>a</sup>                     | hostname             | MGC Id, Node name         |
|                                                     | seqNum               | record sequence number    |
|                                                     | ipAddress            | IP Address of connection  |
|                                                     | portNumber           | Port number of connection |
|                                                     | proprietaryErrorCode | 9                         |

a. These records will be produced for every new connection from the GWCs.

#### **1.2.10.1.1 Error IPDR record format**

Examples for each of the QCA IPDR error records:

Unexpected Record Sequence Number

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>GWC99@CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
  <ipAddress>47.96.0.243</ipAddress>
  <portNumber>37559</portNumber>
  <seqNum>4</seqNum>
  <proprietaryErrorCode>02</proprietaryErrorCode>
</IPDR>
```

### Record Lost: Unsupported Version

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>GWC99@CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
  <ipAddress>47.96.0.243</ipAddress>
  <portNumber>37665</portNumber>
  <seqNum>2</seqNum>
  <proprietaryErrorCode>1</proprietaryErrorCode>
</IPDR>
```

### Record Lost: Unsupported Record Length

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>GWC99@CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
  <ipAddress>47.96.0.243</ipAddress>
  <portNumber>37676</portNumber>
  <seqNum>2</seqNum>
  <proprietaryErrorCode>2</proprietaryErrorCode>
</IPDR>
```

### Connection closed: Unrecognised Message Type

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
```

```
<ipAddress>47.96.0.243</ipAddress>
<portNumber>37642</portNumber>
<seqNum>0</seqNum>
<proprietaryErrorCode>3</proprietaryErrorCode>
</IPDR>
```

### Connection closed: Error while processing QoS record header

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
  <ipAddress>47.96.0.243</ipAddress>
  <portNumber>37642</portNumber>
  <seqNum>0</seqNum>
  <proprietaryErrorCode>4</proprietaryErrorCode>
</IPDR>
```

### Record Lost: Error while processing binary QoS data

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>GWC99@CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
  <ipAddress>47.96.0.243</ipAddress>
  <portNumber>37676</portNumber>
  <seqNum>2</seqNum>
  <proprietaryErrorCode>5</proprietaryErrorCode>
</IPDR>
```

### Connection closed

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
  <EndTime>1970-01-01T00:00:00.000Z</EndTime>
  <timeZoneOffset>0</timeZoneOffset>
  <callCompletionCode>CC</callCompletionCode>
  <originalDestinationId></originalDestinationId>
  <hostName>CS2K_LAB</hostName>
  <subscriberId></subscriberId>
  <uniqueCallId></uniqueCallId>
  <ipAddress>47.96.0.243</ipAddress>
  <portNumber>37676</portNumber>
  <seqNum>0</seqNum>
  <proprietaryErrorCode>6</proprietaryErrorCode>
</IPDR>
```

### QCA Stopped

```
<IPDR>
  <StartTime>1970-01-01T00:00:00.000Z</StartTime>
```

```
<EndTime>1970-01-01T00:00:00.000Z</EndTime>
<timeZoneOffset>0</timeZoneOffset>
<callCompletionCode>CC</callCompletionCode>
<originalDestinationId></originalDestinationId>
<hostName>CS2K_LAB</hostName>
<subscriberId></subscriberId>
<uniqueCallId></uniqueCallId>
<ipAddress>0.0.0.0</ipAddress>
<portNumber>20000</portNumber>
<seqNum>0</seqNum>
<proprietaryErrorCode>7</proprietaryErrorCode>
</IPDR>
```

### QCA Started

```
<IPDR>
<StartTime>1970-01-01T00:00:00.000Z</StartTime>
<EndTime>1970-01-01T00:00:00.000Z</EndTime>
<timeZoneOffset>0</timeZoneOffset>
<callCompletionCode>CC</callCompletionCode>
<originalDestinationId></originalDestinationId>
<hostName>CS2K_LAB</hostName>
<subscriberId></subscriberId>
<uniqueCallId></uniqueCallId>
<ipAddress>0.0.0.0</ipAddress>
<portNumber>20000</portNumber>
<seqNum>0</seqNum>
<proprietaryErrorCode>8</proprietaryErrorCode>
</IPDR>
```

### New GWC Connection

```
<IPDR>
<StartTime>1970-01-01T00:00:00.000Z</StartTime>
<EndTime>1970-01-01T00:00:00.000Z</EndTime>
<timeZoneOffset>0</timeZoneOffset>
<callCompletionCode>CC</callCompletionCode>
<originalDestinationId></originalDestinationId>
<hostName>GWC77@CS2K_LAB</hostName>
<subscriberId></subscriberId>
<uniqueCallId></uniqueCallId>
<ipAddress>47.96.0.243</ipAddress>
<portNumber>37559</portNumber>
<seqNum>567</seqNum>
<proprietaryErrorCode>9</proprietaryErrorCode>
</IPDR>
```

## 1.2.11 Streaming to OSS

Real-Time streaming of the QCA IPDR record stream to the OSS is provided via the streamQoS utility. It should be used as follows:

1. Connect to the machine on which QCA is running, e.g. via telnet
2. Change directory to the QCA home directory, e.g. /opt/nortel/qca/
3. Start the logging to file of the window.



4. Type streamQoS to start the stream
5. The streaming utility is stopped by closing the connection

### 1.2.12 Display tool

A tool to display QCA IPDR records in an output QCA file is provided. There are three outputs from the tool:

- display all the QCA IPDR Records in the file
- display all the QCA IPDR Records for a particular Subscriber Id in the file
- display all the QCA IPDR Records for a particular MGC in the file

The command must have at least one argument, the file name. The command is able to handle the compressed and also uncompressed QCA output files.

To display only the records for a particular Subscriber Id, the Subscriber Id must be provided to the utility.

To display only the records for a particular MGC, the following information is necessary:

- MGC type (GWC or SPM), *mgcType* or *mt* field in QCA IPDR record
- MGC number (0 to 255), *mgcNumber* or *num* in QCA IPDR record

Displaying all QCA IPDR records in a file:

```
displayQoS <file name>
```

Displaying all QCA IPDR record from a particular client in a file:

```
displayQoS <file name> <Subscriber Id>
```

Displaying all QCA IPDR record from a particular client in a file:

```
displayQoS <file name> <MGC type> <MGC number>
```

If the file can not be found an error is displayed.

The first argument is always the file name. If only two arguments are provided the second argument is taken as the Subscriber Id. If more than two arguments are provided they are taken as the MGC type and MGC number.

Example displayQoS output:

```
Displaying QoS Records for GWC 80 from file:  
GWC.Telco_Switch_35.QoS.2002.04.11_02.45_EDT.xml
```

```
Record:  
Start Time      = 1970-01-01T00:00:00.000Z  
End Time        = 1970-01-01T00:00:00.000Z  
TimeZone Offset = 0  
Call Comp Code  = CC
```

```
Orig Dest Id      =
Host name         = GWC171@3911296719576333
Subscriber id     = 70961557517088778@4995546324
Correlation Id    = 14714216668188184186
IP Address        = 96.143.185.15
Port Number       = 35187
Sequence Number   = 9
Latency           = 19685
Octets Received   = 1894381033
Octets Sent       = 1785294279
Packets Received  = 648495757
Packets Sent      = 286520160
Packets Lost      = 922391632
Jitter            = 14826

Record:
Start Time        = 1970-01-01T00:00:00.000Z
End Time          = 1970-01-01T00:00:00.000Z
TimeZone Offset   = 0
Call Comp Code    = CC
Orig Dest Id      =
Host name         = GWC99@CS2K_LAB
Subscriber id     =
Correlation Id    =
IP Address        = 47.96.0.243
Port Number       = 37559
Sequence Number   = 4
Previous seq num  = 2
Error Code        = 0 (Unexpected Record Sequence Number)
```

End of XML QoS File.

**Note:** when displaying error IPDR records, the displayQoS utility adds a textual description to the error code value.

**Note:** when displaying Unexpected Record Sequence Number error IPDR records, the displayQoS utility extracts the previous sequence number value from the proprietaryErrorCode and displays it as a separate field, Previous seq num.

### 1.2.13 Installation

The QCA application (NTQCA.pkg) is available in the CS2M<sup>19</sup> software package. Below are the steps to install the QCA

- Insert the CD with the CS2M load and log onto the SESM server as root. Then change the directory to the bin directory on the CD.

```
cd /cdrom/cdrom0/bin
```

- To start the install process, enter the following command.

```
./appl_mgr.ksh
```

---

<sup>19</sup> CS2M (CS 2000 Management Components) refers to a NCL software package used on the CS 2000 management tools server. This package includes SESM, NPM, SAM21EM, QCA.

**Note:** Select option 1 to install all the application along with QCA.

Below are the steps when QCA needs to be installed on a SSPFS machine which does not run the CS2M load.

- FTP the NTQCA.pkg onto the SSPFS machine. Log in as root.
- Install the new QCA software using: `pkgadd -d NTQCA.pkg`

Below are the steps to follow to uninstall the QCA package.

- Connect to the host where the QCA is running.
- Log in as root.
- Stop the QCA server: `stop_qca`.
- Uninstall the original QCA package: `pkgrm NTQCA`.

### 1.2.14 Upgrades

As of SN06.2, the QCA is a patchable component. The patchability mechanism conflicts with the in-service upgrade mechanism. So the support for in-service upgrade of QCA on a single SSPFS machine is removed. Please see section 2.2.15 for more details.

The QCA software upgrades are performed using the install scripts provided with QCA as part of the new software release. Software upgrades of QCA must be coordinated with the OSS to avoid loss of data. The OSS would be redirected to an alternative QCA instance while the primary QCA is being updated. Once the primary instance is updated, the OSS can be redirected back to the primary instance and the other instances can be updated.

In-service upgrade, with no loss of records, is only supported if two, or more, QCAs are operating in the network. This can be in two configurations; QCAs on different hosts, or multiple QCAs on a single host.

The new QCA should be started and run in parallel with the original QCA for a soak period. After the new QCA has successfully passed the soak period the original QCA can be stopped.

Installing the new QCA software overwrites the original QCA software. So it is suggested to take a backup of the original QCA software in the event that the new QCA software needs to be backed out.

### 1.2.15 QCA customer logs

In addition to QCA Error IPDR Records the QCA raises alarms and events via the customer logging stream.

The QCA uses the logging API introduced by activity 89008996 “Log Reporting and Storage Mechanism for Managed Elements”.

**Figure 4 Sample customer log message generated by QCA**

```
Oct 11 12:00:02 wmdhs0j8 main:0001 QCA201 WARNING init wmdhs0j8
RetainFileTime property in properties/qca.properties is out of
range. QCA is starting with default retain file time of 5 days
```

The QCA customer logs contain the following fields

- Report name
- Report Number
- Priority
- Event Type
- Device ID
- Message

All the QCA customer logs contain the following information:

- Report name = “QCA”
- Device ID = QCA host name

See Appendix A - QCA Customer Logs for a summary of QCA customer logs and the contents of the other fields in the logs.

The QCA also generates debug logs to report software errors.

### 1.2.16 Patchability

Activity A00003229 provides the functionality of making the QCA a patchable OAM device. The Network Patch Manager is responsible for administering individual fixes to QCA. Patches for the QCA will be in the same format and have the same naming convention of OAM patches such as NPM, SAM21EM, etc

When a QCA patch (containing modified Java-based classes) is delivered to a customer site, the patch is applied and then the QCA application is required to be stopped and then restarted by the NPM for the patch to be ‘enabled’. The restart enables a new Java Virtual Machine to be started that picks up the patched/modified Java classes. This procedure also applies to removal of QCA patches. For a QCA patch to be truly removed, the patch is removed and then a restart must be performed via the NPM on the application.

The QCA application must be inservice to perform any maintenance operations such as application, removal, or restart. In addition, the QCA application must be inservice for an audit to succeed. Because QCA is monitored or polled by an external system (OSS) for performance data or SLA

agreements, it is important that any changes to QCA be coordinated to avoid loss of data or duplication of data. The OSS should be moved from monitoring the primary instance of QCA to an alternative QCA instance while the primary QCA is being updated via the restart request initiated by NPM. Once the primary instance is updated, the OSS should be redirected back to the primary instance and the other instances can be updated.

Since QCA is an OAM software application, it will be registered in the NPM database upon system start-up and initialization, and it will appear as a device with the device name `QCA_<node_name>`, where `node_name` is the name of the SSPFS machine where the QCA is running. Reports and queries at the NPM Graphical User Interface (GUI) and NPM Command Line User Interface (CLUI) will show the QCA as a device.

In SN06.2, the support for in-service QCA upgrade (on a single SSPFS machine) is removed to enable QCA patchability. Hence, the scripts to start and stop the second instance of QCA (`qca_server2` and `stop_qca2`) will be obsoleted in this release.

The following sections briefly give information about applying/removing patches to/from QCA.

#### 1.2.16.1 Applying patch to QCA

The following steps are a recommended procedure in applying QCA patches to a QCA application.

- QCA patch files are delivered to a customer site to the SSPFS machine containing the NPM server via RPS/PFRS or by manual action.
- QCA patches are introduced to the NPM database via the NPM CLUI with the 'getpatch' command.
- QCA patches are applied to the QCA application via the NPM apply command at the NPM GUI or NPM CLUI.

After all the QCA patches are applied, a restart command from the NPM GUI or NPM CLUI is invoked on the QCA application to enable or activate the patches.

**Note:** A restart consists of stopping the QCA application and then starting the application. It is important that any maintenance activities associated with the QCA should be completed or stopped before the restart from the NPM GUI or CLUI is invoked. Also, the OSS should be directed from the primary instance of QCA to an alternative instance prior to the restart. The NPM restart will result in current active file being moved into the *today* directory and a new active file will be opened. The whole of this operation will take around **60 seconds**, during this period any QoS records sent from GWC to QCA will be lost.

Also, a NPM restart will result in following logs.

- 1 NPM 620: Initiated restart on device,<qca\_devicename>.
- 2 GWC 312: QCA connection failure, indicating that GWC is having communication problems with QCA.
- 3 NPM 620: A restart initiated by the NPM on device <qca\_devicename> has completed.
- 4 QCA 322: New GWC Connection, indicating that QCA has come up after the restart, and is accepting connections.
- 5 GWC 399: Clear event for GWC312, indicating that previous 'Raise' event is cleared.

**Note:** It is important to note the NPM database could show patches to be applied to an OAM device, but the patch is not actually enabled or performing its task to address the original problem. It is only after a restart is performed from the NPM GUI or CLUI on the OAM device that the patch is enabled.

- After the restart is performed on the QCA an NPM audit needs to be executed to update OAM patch enabled statuses in the NPM database. The audit can be performed manually from the NPM GUI or CLUI or it will be done automatically on the device approximately 20-25 minutes after the restart has been completed.

### 1.2.16.2 Removing Patch from QCA

The following steps are a recommended procedure in removing QCA patches from QCA.

- QCA patches are removed via the NPM remove command at the NPM GUI or NPM CLUI.
- After all QCA patches are removed, a restart command from the NPM GUI or NPM CLUI is invoked on the QCA to disable the patches.

**Note:** A restart consists of stopping the QCA application and then starting the QCA application. It is important that any maintenance activities associated with QCA should be completed or stopped before the restart from the NPM GUI or CLUI is invoked. Also, the OSS should be directed from the primary instance of QCA to an alternative instance prior to the restart. The NPM restart will result in current active file being moved into the *today* directory and a new active file will be opened. The whole of this operation will take around **60 seconds**, during this period any QoS records sent from GWC to QCA will be lost.

Also, a NPM restart will result in following logs.

- 1 NPM 620: Initiated restart on device,<qca\_devicename>
- 2 GWC 312: QCA connection failure, indicating that GWC is having communication problems with QCA.
- 3 NPM 620: A restart initiated by the NPM on device <qca\_devicename> has completed.
- 4 QCA 322: New GWC Connection, indicating that QCA has come up after the restart, and is accepting connections.
- 5 GWC 399: Clear event for GWC312, indicating that previous 'Raise' event is cleared.

**Note:** It is important to note the NPM database could show patches to be removed from an OAM device, but the patch is still enabled or performing its task to address the original problem. It is only after a restart is performed from the NPM GUI or CLUI on the OAM device that the patch is disabled.

- After the restart is performed on the QCA, an NPM audit needs to be executed to update QCA patch enabled statuses in the NPM database. The audit can be performed manually from the NPM GUI or CLUI or it will be done automatically on the device approximately 20-25 minutes after the restart has been completed.

#### 1.2.16.3 AutoApply

QCA patches can be automatically applied if the end user has the automated process scheduled to run. Refer to the NPM online help for more information on this automated process.

#### 1.2.16.4 Restart and Auto Restart Restrictions

Due to the implications to the OSS, restrictions are placed on the NPM restart command for QCA devices. The following restrictions are enforced by the NPM:

- QCA devices are not included in the set of OAM devices that can be auto-restarted, nor can a QCA restart be included in any plans scheduled at a designated time. Only a manual restart of a QCA device is supported.
- Only one QCA at a time can be restarted. The multitasking ability of NPM is not utilized for QCA.

A warning will be displayed to the user by the NPM CLUI or GUI explaining the implications of restarting QCA. The user will be forced to choose whether to continue with the restart command or to cancel.



### 1.2.17 QCA Software Management

The QCA application is designed to allow multiple copies to run in the network to provide increased levels of reliability. Additional copies of the QCA application should be installed on different servers and assigned in the GWC EM. Two instances of QCA can not be installed on the two halves of the same high availability cluster; they must be on separate servers. Because QCA is monitored or polled by an external system (OSS) for performance data or SLA agreements, it is important that any changes to QCA be coordinated with the OSS to avoid loss of data or duplication of data. These changes include starting or stopping the application, applying corrective content, or applying upgrades. The OSS must be able to move from monitoring one instance of QCA to another during patching or upgrades or any activity that interrupts the QCA application. The OSS can either be manually redirected to another instance of QCA or programmed to automatically redirect on command.

## 1.3 Hardware Requirements or Dependencies

The QCA application has the following requirements:

- SUN Netra T1400

440Mhz UltraSPARCC IIi with QFE card, 4MB Cache, 512MB RAM, 2x18.2GB Disk Running SUN Solaris 8 Oracle DB 8.1.6 Enterprise and Java Virtual Machine.

*Note:* The QCA can run on the same SUN Netra T1400 that SESM and other network management tools are running on.

## 1.4 Software Requirements or Dependencies

- SSPFS 3d party software suite Version 06.

## 1.5 Limitations and restrictions

### 1.5.1 Upgrades

To ensure that the QCA support the version of QoS record used in the network, the QCA must be upgraded before the QoS reporting clients are upgraded.

*Note:* For a major release upgrade, where the SSPFS software is upgraded before the QCA, a QCA running on a separate host is required to ensure no loss of QoS records.

*Note:* For a QCA maintenance release upgrade or when applying patches, a QCA running on a separate host is required to ensure no loss of QoS records.

*Note:* Corrective content is applied and managed by the Network Patch Manager (NPM). Because of the need to coordinate QCA changes like



patching with the external OSS, QCA patches are manually applied and activated. This allows the OSS to be redirected to an alternative QCA instance while the primary QCA is being updated. Once the primary instance is updated, the OSS can be redirected back to the primary instance and the other instances can be updated.

## 1.6 Interactions

- Syslog daemon server

## 1.7 Applicable customer facing sections

### Fault Management

Logs \_\_\_\_\_

Alarms \_\_\_\_\_

### Configuration

Data Schema \_\_\_\_\_

User Interface \_\_\_\_\_

Element Management \_\_\_\_\_

Security \_\_\_\_\_

Service Order \_\_\_\_\_

Office Parameters \_\_\_\_\_

Accounting (includes AMA billing) \_\_\_\_\_

Performance (includes operational measurements) \_\_\_\_\_

## 1.8 Glossary

| Term        | Description                         |
|-------------|-------------------------------------|
| <b>ATM</b>  | Asynchronous Transfer Mode          |
| <b>CLLI</b> | Common Language Location Identifier |
| <b>CLUI</b> | Command Line User Interface         |
| <b>CMTS</b> | Cable Modem Terminal System         |
| <b>DPT</b>  | Dynamic Packet Trunk                |
| <b>FQDN</b> | Fully Qualified Domain Name         |
| <b>GUI</b>  | Graphical User Interface            |
| <b>GW</b>   | Gateway                             |

| Term        | Description                               |
|-------------|-------------------------------------------|
| <b>GWC</b>  | Gateway Controller                        |
| <b>IP</b>   | Internet Protocol                         |
| <b>IOM</b>  | Input/Output Module                       |
| <b>OC</b>   | Optical Carrier                           |
| <b>OSS</b>  | Operations Support System                 |
| <b>MGC</b>  | Media Gateway Controller                  |
| <b>MS</b>   | Message Switch                            |
| <b>NCS</b>  | Network Control System                    |
| <b>NE</b>   | Network Element                           |
| <b>NPM</b>  | Network Patch Manager                     |
| <b>PFRS</b> | Patch File Receipt System                 |
| <b>PSE</b>  | Patching Server Element                   |
| <b>PVG</b>  | Passport Voice Gateway                    |
| <b>QCA</b>  | QoS Collector Application                 |
| <b>QoS</b>  | Quality of Service                        |
| <b>RPS</b>  | Regional Patch Selector                   |
| <b>SDM</b>  | SuperNode Data Manager                    |
| <b>SESM</b> | Succession Element and Subelement Manager |
| <b>SLA</b>  | Service Level Agreement                   |
| <b>SPM</b>  | Spectrum Peripheral Module                |
| <b>STM</b>  | Synchronous Transfer Mode                 |
| <b>USP</b>  | Universal Signalling Processor            |
| <b>UTF</b>  | Universal Text Format                     |
| <b>VMG</b>  | Virtual Media Gateway                     |
| <b>VoIP</b> | Voice over IP                             |
| <b>XML</b>  | eXtensible Markup Language                |

## 1.9 References.

1. Activity 89007790 - QoS Reporting: Correlation ID and billing

2. Activity 89007749 - QoS Reporting: GWC QoS Reporting Application and Connection Management
3. Activity 89007781 - QoS Reporting: Provisioning
4. Activity 59039902 - SNMP Performance Measurement Poller
5. Activity 89008996 - Log Reporting and Storage Mechanism for Managed Elements

## 1.10 Appendix A - QCA Customer logs

**Table 7 Service summary (initialization) warning logs**

| Event / Error                                                                  | Report # | Priority | Event Type | Description                                                                                                                    | QCA Action   | Cust-omer Action |
|--------------------------------------------------------------------------------|----------|----------|------------|--------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|
| Qca.properties not available at QCA start-up.                                  | 201      | Warning  | INIT       | Properties file (properties/qca.properties) not available. QCA is starting with default settings.                              | Default used | None             |
| portNumber property not in properties/qca.properties at QCA start-up.          | 201      | Warning  | INIT       | portNumber property not in properties/qca.properties. QCA is starting with default port number of 20000                        | Default used | None             |
| portNumber property in properties/qca.properties not in range at QCA start-up. | 201      | Warning  | INIT       | portNumber property in properties/qca.properties not in range. QCA is starting with default port number of 20000               | Default used | None             |
| portNumber property in properties/qca.properties not a number at QCA start-up. | 201      | Warning  | INIT       | portNumber property in properties/qca.properties could not be used. QCA is starting with default port number of 20000          | Default used | None             |
| MaxFileSize property not in properties/qca.properties .                        | 201      | Warning  | INIT       | MaxFileSize property not in properties/qca.properties. QCA is starting with default maximum file size of 1 MByte               | Default used | None             |
| MaxFileSize property in properties/qca.properties not in range.                | 201      | Warning  | INIT       | MaxFileSize property in properties/qca.properties not in range. QCA is starting with default maximum file size of 1 MByte      | Default used | None             |
| MaxFileSize property in properties/qca.properties not a number.                | 201      | Warning  | INIT       | MaxFileSize property in properties/qca.properties could not be used. QCA is starting with default maximum file size of 1 MByte | Default used | None             |

**Table 7 Service summary (initialization) warning logs**

| Event / Error                                                      | Report # | Priority | Event Type | Description                                                                                                                       | QCA Action   | Cust-omer Action |
|--------------------------------------------------------------------|----------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------|------------------|
| MaxFileTime property not in properties/qca.properties .            | 201      | Warning  | INIT       | MaxFileTime property not in properties/qca.properties. QCA is starting with default maximum file time of 15 minutes               | Default used | None             |
| MaxFileTime property in properties/qca.properties not in range.    | 201      | Warning  | INIT       | MaxFileTime property in properties/qca.properties not in range. QCA is starting with default maximum file time of 15 minutes      | Default used | None             |
| MaxFileTime property in properties/qca.properties not a number.    | 201      | Warning  | INIT       | MaxFileTime property in properties/qca.properties could not be used. QCA is starting with default maximum file time of 15 minutes | Default used | None             |
| RetainFileTime property not in properties/qca.properties .         | 201      | Warning  | INIT       | RetainFileTime property not in properties/qca.properties. QCA is starting with default retain file time of 5 days                 | Default used | None             |
| RetainFileTime property in properties/qca.properties not in range. | 201      | Warning  | INIT       | RetainFileTime property in properties/qca.properties not in range. QCA is starting with default retain file time of 5 days        | Default used | None             |
| RetainFileTime property in properties/qca.properties not a number. | 201      | Warning  | INIT       | RetainFileTime property in properties/qca.properties could not be used. QCA is starting with default retain file time of 5 days   | Default used | None             |
| recycleToD property not in properties/qca.properties .             | 201      | Warning  | INIT       | recycleToD property not in properties/qca.properties. QCA is starting with default recycle hour of day of 0                       | Default used | None             |
| recycleToD property in properties/qca.properties not in range.     | 201      | Warning  | INIT       | recycleToD property in properties/qca.properties not in range. QCA is starting with default recycle hour of day of 0              | Default used | None             |
| recycleToD property in properties/qca.properties not a number.     | 201      | Warning  | INIT       | recycleToD property in properties/qca.properties could not be used. QCA is starting with default recycle hour of day of 0         | Default used | None             |
| fileExt property not in properties/qca.properties .                | 201      | Warning  | INIT       | fileExt property not in properties/qca.properties. QCA is starting with default file extension of xml                             | Default used | None             |

**Table 7 Service summary (initialization) warning logs**

| Event / Error                                                                  | Report # | Priority | Event Type | Description                                                                                                                  | QCA Action                                                     | Cust-omer Action  |
|--------------------------------------------------------------------------------|----------|----------|------------|------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------|
| oldFileCompression property not in properties/qca.properties .                 | 201      | Warning  | INIT       | oldFileCompression property not in properties/qca.properties. QCA is starting with default value of true                     | Default used                                                   | None              |
| oldFileCompression property in properties/qca.properties not true or false.    | 201      | Warning  | INIT       | oldFileCompression property in properties/qca.properties could not be used. QCA is starting with default value of true       | Default used                                                   | None              |
| closedFileCompression property not in properties/qca.properties .              | 201      | Warning  | INIT       | closedFileCompression property not in properties/qca.properties. QCA is starting with default value of true                  | Default used                                                   | None              |
| closedFileCompression property in properties/qca.properties not true or false. | 201      | Warning  | INIT       | closedFileCompression property in properties/qca.properties could not be used. QCA is starting with default value of true    | Default used                                                   | None              |
| nodeName property not in properties/qca.properties .                           | 201      | Warning  | INIT       | nodeName property not in properties/qca.properties. QCA is starting with default value of QCA                                | Default used                                                   | None              |
| old file retention directory (today-x) is being removed.                       | 202      | None     | INIT       | File Recovery: removing closed file retention directory: <i>directory</i> as it is older than x days.                        | Director y remove d                                            | None              |
| File found in active directory when QCA started.                               | 202      | None     | INIT       | File Recovery: <i>file name</i> found in active directory. This could indicate that the QCA failed. Please check debug logs. | File complet ed (if necessa ry) and moved to today director y. | Check debug logs. |

To comply with X.733, the structure of the logs will also contain following attributes. The logs are differentiated from each other by Specific Problem and Description attributes.

- Location : QCA Host Name
- Category : Appropriate category from X.733 list of available categories.
- Cause : Appropriate category from X.733 list of available cause-values.

- Time : Time at which log was generated.
- ComponentID : File /Directory path, GWC name (components causing generation of log)
- SpecificProblem : Text giving details of the specific-problem
- Description : Text describing the problem and/or giving more information.

**Table 8 Trouble logs**

| Event / Error                                                        | Report # | Priority | Event Type | Description                                                                                                                                                                                                                                                                                                                                                                                                     | QCA Action                                                         | Customer Action                                                             |
|----------------------------------------------------------------------|----------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------|
| File handler or server socket could not be started.                  | 300      | None     | FAIL       | QCA not started: Could not open server socket: <i>+reason</i> or<br>QCA not started: Could not create File Handler: <i>+reason</i>                                                                                                                                                                                                                                                                              | QCA not started                                                    | Rectify problem and re-start QCA.                                           |
| Out of sequence QoS record received.                                 | 302      | None     | FLT        | Out of Sequence QoS Record received. 'MGC Type MGC number': sequence number = ' <i>record sequence number</i> ' previous sequence number = ' <i>last record sequence number</i> '                                                                                                                                                                                                                               | XML Error record generated.                                        | None                                                                        |
| Problem processing binary QoS record.                                | 302      | None     | FLT        | Problem processing binary QoS record: Sequence number = ' <i>record sequence number</i> '<br>Relevant MGC is mentioned in <i>Component ID</i> attribute of the log.                                                                                                                                                                                                                                             | XML Error record generated.<br>XML QoS Record not written to file. | None                                                                        |
| QoS Record received with Unsupported Length.<br>(Notification Id: 9) | 301      | Minor    | FLT        | Location: <hostName> Notification ID: 9 State: Raise Category:Processig Error Cause: Corrupt Data.<br>Time:<time> Component Id: 'MGCType MGCNum' Specific Problem: The QCA has received records with < numberOfLengthErrors> length errors from the source. Description: If 10 (or more) records with unsupported length are received consecutively, Major fault log is generated and the connection is closed. | XML Error record generated.<br>XML QoS Record not written to file. | Investigate why client is sent QoS Record with Unsupported Length           |
| 10 sequential QoS Records received with Unsupported Length.          | 301      | Major    | FLT        | Location: <hostName> Notification ID: 9 State: Raise Category:Processig Error Cause: Version mismatch.<br>Time:<time> Component Id: 'MGCType MGCNum' Specific Problem: 10 unsupported length records received. The connection to the client will be closed                                                                                                                                                      | Connection to client closed                                        | Investigate why client is repeatedly sending Unsupported Length QoS records |

| Event / Error                                                                                    | Report # | Priority | Event Type | Description                                                                                                                                                                                                                                                                                                                                                                                                        | QCA Action                                                      | Customer Action                                                             |
|--------------------------------------------------------------------------------------------------|----------|----------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------|
| QoS Record received with Unsupported Version.<br>(Notification Id: 57)                           | 301      | Minor    | FLT        | Location: <hostName> Notification ID:57 State: Raise Category:Processig Error Cause: Version mismatch. Time:<time> Component Id: 'MGCType MGCNum' Specific Problem: The QCA has received records with <NumberOfVersionErrors> version errors from the source. Description: If 10 (or more) records with unsupported version are received consecutively, Major fault log is generated and the connection is closed. | XML Error record generated. XML QoS Record not written to file. | Investigate why client is sent QoS Record with Unsupported Version          |
| 10 sequential QoS Records received with Unsupported Version.                                     | 301      | Major    | FLT        | Location: <hostName> Notification ID: 57 State: Raise Category:Processig Error Cause: Version mismatch. Time:<time>Component Id: 'MGCType MGCNum' Specific Problem: 10 unsupported version records received.<br><br>The connection to the client will be closed.                                                                                                                                                   | Connection to client closed                                     | Investigate why client is repeatedly sending Unsupported Length QoS records |
| The binary QoS Record header could not be processed.                                             | 305      | None     | FLT        | Connection closed: Error while processing QoS record header:<br><br>Client at, IP Address ' <i>client IP Address</i> '. Local Port ' <i>local port number</i> ' closed connection.                                                                                                                                                                                                                                 | Connection to client closed                                     | Investigate why client is sent QoS Record with faulty header                |
| Disk space shortage, local disk requires more free space. Disk Space is below 100Mb.             | 310      | Critical | TBL        | Location: <hostName> Notification ID: 49 State: Raise Category:Processig Error Cause: StorageCapacityproblem. Time:<time>Component Id: /data/qca Specific Problem: checkDiskSpace() has shown that there is less than 104857600 bytes available on the local disk. More Space is required immediately.                                                                                                             | None                                                            | More space must be created.                                                 |
| Disk Space is starting to run seriously low. This means that the available space is below 500Mb. | 310      | Major    | TBL        | Location: <hostName> Notification ID: 49 State: Raise Category:Processig Error Cause: StorageCapacityProblem. Time:<time>Component Id: /data/qca. Specific Problem:Less than 524288000 bytes available on the local disk.Critical alarm will be raised if disk space continues to drop.                                                                                                                            | None                                                            | More space must be created.                                                 |

| Event / Error Report #                                                                                                                                                       | Priority | Event Type | Description | QCA Action                                                                                                                                                                                                                                                                                  | Customer Action                      |                                                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------|
| Disk space is below the minimum threshold. Initially set at 1Gb.                                                                                                             | 310      | Minor      | TBL         | Location: <hostName> Notification ID: 49 State: Raise Category:Processig Error Cause: StorageCapacityProblem. Time:<time>Component Id: /data/qca. Specific Problem: Less than 1073741824 bytes available on the local disk. Major alarm will be raised if the disk space continues to drop. | None                                 | More space must be created.                                                 |
| A request to get a new file name has failed, there are either 10000 files with the same name or the new file can not be created.                                             | 315      | Warning    | FLT         | Unable to get an unused file name for <fileName> Please check the output directory.                                                                                                                                                                                                         | file null.xml used                   | Output directories need to be checked.                                      |
| The QCA has failed to write the footer information to the active file whilst attempting to close. The active file might have been compressed without the footer information. | 315      | Warning    | FLT         | Cannot write the FOOTER to the active file. This file is corrupted FileName = <fileName>.                                                                                                                                                                                                   | None                                 | Check the file and confirm that all XML tags have been closed.              |
| The active file did not exist when trying to write to it. Attempt to get new file then failed. Further failures will result in the QCA being shutdown.                       | 315      | None       | FLT         | Active file <fileName> has been removed. Data may have been lost. Creating new file, and attempting to write record again. Failure to do so will result in shutdown of the QCA                                                                                                              | Attempts to create a new output file | File IO problems, if problem is resolved the Major alarm will be withdrawn. |



| Event / Error                                                                                                                                                                                                      | Report # | Priority | Event Type | Description                                                                                                             | QCA Action      | Customer Action                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|------------|-------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------------------------------------------------------------------|
| Attempting to write data to file, the active file does not exist. Try to get new file. This has failed. Sleep The thread and try and get new file again. This also failed. No file to write to, QCA will shutdown. | 315      | None     | FAIL       | Could not get new file to write records. File <fileName> is corrupted or removed. QCA shutting down.                    | QCA is stopped. | check: disk space and write permissions. If all is well try starting QCA again. |
| The XML writer and the file all seem well, unfortunately the file cannot be accessed at in either the first or second attempt, serious problem with file IO. QCA will shutdown.                                    | 315      | None     | FAIL       | Could not write to the activefile. Active file exists but cannot write records to it. Reason unknown. QCA shutting down | QCA is stopped. | check: disk space and write permissions. If all is well try starting QCA again. |
| The QCA has encountered inconsistent errors when building the directory structure for old files, old files may have been deleted and directory locked. The error should never appear, as it is the last resort.    | 315      | None     | FAIL       | Cannot create directories under <i>output</i> directory. Cannot write records. QCA shutting down                        | QCA is stopped. | Check: directory structure, active and old files.                               |

| Event / Error                                                                                                                                                                          | Report # | Priority | Event Type | Description                                                                                                              | QCA Action                               | Customer Action                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------|------------|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------------------------|
| Attempt to rename the active file from the active directory to the today directory has failed. Serious error, but no loss of data immediately. Files can be moved by hand if required. | 315      | None     | FLT        | Could not rename active file <fileName> to file <new File Name>. Please check write permissions for the output directory | Closed file remains in active directory. | Check the directories exist and all the write permissions. |
| Could not create new active file. Data is being lost.QCA must shut down.                                                                                                               | 315      | None     | FAIL       | Could not get new file for writing. Critical Error: <reason>. QCA shutting down.                                         | QCA is stopped.                          | Check the active directory for old files and permissions.  |
| Attempt to compress an old active file has failed.                                                                                                                                     | 315      | None     | FLT        | Could not compress file: <fileName>. File compression failed.                                                            | None                                     | Check the active directory for old files and permissions.  |
| Failed to rename directories on the Recycle_day proc. This is where all files are moved along a level and the last gets deleted.                                                       | 315      | None     | FLT        | Could not rename director from <dirName> to <newDirName>. Check disk space and permissions.                              | None                                     | Check disk space and permissions.                          |
| New GWC connection received.                                                                                                                                                           | 322      | None     | INFO       | New GWC COnection: ' <i>MGC Type MGC number</i> ': sequence number = ' <i>record sequence number</i> '                   | XML Error record generated               |                                                            |

**Table 9 Information and alarm clear logs**

| <b>Event / Error</b>                                                                                   | <b>Report #</b> | <b>Priority</b> | <b>Event Type</b> | <b>Description</b>                                                                                                                   | <b>QCA Action</b>                      | <b>Cus-tomer Action</b> |
|--------------------------------------------------------------------------------------------------------|-----------------|-----------------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------|
| Connection closed.                                                                                     | 305             | None            | INFO              | Connection closed.<br>Client at, IP Address ' <i>client IP Address</i> '. Local Port ' <i>local port number</i> ' closed connection. | Connec-<br>tion to<br>client<br>closed | None                    |
| Client has stopped sending records with unsupported length<br>(clear for QCA 301 Notification Id: 9)   | 399             | None            | INFO              | Location: <Hostname> Notification Id: 9 State: Alarm Cleared Time: <time>                                                            | None                                   | None                    |
| Client has stopped sending records with unsupported version<br>(clear for QCA 301 Notification Id: 57) | 399             | None            | INFO              | Location: <Hostname> Notification Id: 57 State: Alarm Cleared Time: <time>                                                           | None                                   | None                    |
| Critical disk space issue cleared<br>(clear for 310 Critical Alarm)                                    | 399             | None            | INFO              | Location: <Hostname> Notification Id: 49 State: Alarm Cleared Time: <time>                                                           | None                                   | None                    |
| Major disk space issue cleared<br>(clear for 310 Major Alarm)                                          | 399             | None            | INFO              | Location: <Hostname> Notification Id: 49 State: Alarm Cleared Time: <time>                                                           | None                                   | None                    |
| Minor disk space issue cleared<br>(clear for 310 Minor Alarm)                                          | 399             | None            | INFO              | Location: <Hostname> Notification Id: 49 State: Alarm Cleared Time: <time>                                                           | None                                   | None                    |

| Event / Error         | Report # | Priority | Event Type | Description                                                                                                                                                                                                                                                                                                                                                                                                          | QCA Action                             | Cus-tomer Action |
|-----------------------|----------|----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|------------------|
| QCA cannot be stopped | 203      | None     | INIT       | Location: <Hostname><br>Category:PROCESSINGERROR<br>Cause:CONFIGERROR Time: ComponenetID:<br>SpecificProblem:QCA not running on specified port:<br>Description:Cannot stop QCA Action:Use query_qca command to determine the port QCA is running on. Make sure it matches with portNumber in qca.properties file."                                                                                                   | Connec-<br>tion to<br>client<br>closed | None             |
| QCA cannot be stopped | 203      | None     | INIT       | Location: <Hostname><br>Category:PROCESSINGERROR<br>Cause:CONFIGERROR Time: ComponenetID:<br>SpecificProblem:Missing qca.properties file.<br>Description:Could not read properties. QCA cannot be stopped.Action:Restore qca.properties file.                                                                                                                                                                        | None                                   | None             |
| QCA cannot be stopped | 203      | None     | INIT       | <b>Location:</b> <Hostname><br><b>Category:</b> PROCESSINGERROR<br><b>Cause:</b> CONFIGERROR Time: <b>ComponenetID:</b><br><b>SpecificProblem:</b> Attribute portNumber missing from qca.properties while trying to stop QCA. <b>Description:</b> Cannot determine QCA port number to stop QCA. <b>Action:</b> Add portNumber information to qca.properties file.                                                    | None                                   | None             |
| QCA cannot be stopped | 203      | None     | INIT       | <b>Location:</b> <Hostname><br><b>Category:</b> PROCESSINGERROR<br><b>Cause:</b> CONFIGERROR Time: <b>ComponenetID:</b><br><b>SpecificProblem:</b> Incorrect portNumber specified in qca.properties. <b>Description:</b> Cannot determine QCA port number to stop QCA <b>Action:</b> Use query_qca command to determine the port QCA is running on. Make sure it matches with portNumber in qca.properties file.     | None                                   | None             |
| QCA cannot be stopped | 203      | None     | INIT       | <b>Location:</b> <Hostname><br><b>Category:</b> PROCESSINGERROR<br><b>Cause:</b> CONFIGERROR Time: <b>ComponenetID:</b><br><b>SpecificProblem:</b> Out of range portNumber specified in qca.properties. <b>Description:</b> Cannot determine QCA port number to stop QCA. <b>Action:</b> Use query_qca command to determine the port QCA is running on. Make sure it matches with portNumber in qca.properties file. | None                                   | None             |
| Connection closed.    | 305      | None     | ERROR      | <b>Location:</b> <Hostname><br><b>Category:</b> COMMUNICATIONS<br><b>Cause:</b> COMMSUBFAIL Time: <b>SpecificProblem:</b> ..<br>MSGTYPEERROR <b>Description:</b> Client at, IP Address: closed connection.                                                                                                                                                                                                           | None                                   | None             |

| Event / Error      | Report # | Priority | Event Type | Description                                                                                                                                                                                                     | QCA Action | Customer Action |
|--------------------|----------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|
| Connection closed. | 305      | None     | INFO       | <b>Location:</b> <Hostname><br><b>Category:</b> COMMUNICATIONS<br><b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> CONNECTIONCLOSED <b>Description:</b> Client at, IP Address: closed connection. | None       | None            |
| Connection closed. | 305      | None     | ERROR      | <b>Location:</b> <Hostname><br><b>Category:</b> COMMUNICATIONS<br><b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> HEADERERROR. <b>Description:</b> Client at, IP Address: closed connection      | None       | None            |
| Connection closed. | 305      | None     | INFO       | <b>Location:</b> <Hostname><br><b>Category:</b> COMMUNICATIONS<br><b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> CONNECTIONCLOSED. <b>Description:</b> Client at, IP Address: closed connection | None       | None            |
| Connection closed. | 305      | None     | INFO       | <b>Location:</b> <Hostname><br><b>Category:</b> COMMUNICATIONS<br><b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> CONNECTIONCLOSED <b>Description:</b> Client at, IP Address: closed connection  | None       | None            |

Examples of Error messages given below:

**Table 2 201 Message**

| Report # | Message                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 201      | May 27 16:41:45 rtpysesm1 QCA: _V2_~l=rtpysesm1~H=rtpysesm1~A=QCA~S=0000~~ QCA201<br>WARNING INIT rtpysesm1 ^M Location: rtpysesm1^M Category: processingError^M Cause:<br>configurationOrCustomizationError^M Time: May 27 16:41:45 2005^M ComponentID:<br>/opt/nortel/qca/properties/qca.properties^M SpecificProblem: Missing qca.properties file.^M<br>Description: Could not read properties. QCA is starting with default settings.^M |

**Table 3 202 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 202                   | Aug 19 22:22:02 wnc0s0qu QCA: _V2_~l=wnc0s0qu~H=wnc0s0qu~A=QCA~S=0000~~ QCA202 NONE INIT wnc0s0qu ^M Location: wnc0s0qu^M Category: processingError^M Cause: fileError^M Time: Aug 19 22:22:02 2004^M ComponentID: /data/qca/20000/output/active/^M SpecificProblem: Old file(s) present in active directory.^M Description: Moving old file: QCA.QCA.QoS.2004.08.19_22.19_EDT.xml, found in active directory. This could indicate that QCA failed.^M |

**Table 4 203 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 203                   | May 30 22:55:50 india1sesm QCA_STOP: _V2_~l=india1sesm~H=india1sesm~A=QCA_STOP~S=0000~~ QCA203 NONE INIT india1sesm ^M Location: india1sesm^M Category: processingError^M Cause: configurationOrCustomizationError^M Time: May 30 22:55:50 2005^M ComponentID: /opt/nortel/qca/properties/qca.properties^M SpecificProblem: Missing qca.properties file.^M Description: Could not read properties. QCA cannot be stopped.^M Action: Restore qca.properties file.^M |

**Table 5 300 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                      |
| 300                   | May 31 04:22:08 india1sesm QCA: _V2_~l=india1sesm~H=india1sesm~A=QCA~S=0002~~ QCA300 NONE FAIL india1sesm ^M Location: india1sesm^M Category: processingError^M Cause: communicationsSubsystemFailure^M Time: May 31 04:22:08 2005^M ComponentID: GWC-99^M SpecificProblem: Socket creation error.^M Description: QCA not started:^M |

**Table 6 302 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 302                   | May 31 04:22:08 india1sesm QCA: _V2_~l=india1sesm~H=india1sesm~A=QCA~S=0002~~ QCA302 NONE FLT india1sesm ^M Location: india1sesm^M Category: processingError^M Cause: informationOutOfSequence^M Time: May 31 04:22:08 2005^M ComponentID: GWC-99^M SpecificProblem: Unexpected Record Sequence Number^M Description: Out of sequence QoS record received. Sequence Number = 1670001 Previous sequence number = 0^M |

**Table 7 305 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                                                       |
| 305                   | Aug 19 22:18:34 wnc0s0qu QCA: _V2_~l=wnc0s0qu~H=wnc0s0qu~A=QCA~S=0121~~ QCA305 NONE<br>INFO wnc0s0qu ^M Location: wnc0s0qu^M Category: communications^M Cause:<br>communicationsSubsystemFailure^M Time: Aug 19 22:18:34 2004^M SpecificProblem:<br>Connection closed^M Description: Client at, IP Address: kiran-1.ca.nortel.com. Port: 2512 closed<br>connection.^M |

**Table 8 310 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 310                   | May 30 22:52:45 india1sesm QCA: _V2_~l=india1sesm~H=india1sesm~A=QCA~S=0000~~ QCA310<br>CRIT TBL india1sesm ^M Location: india1sesm^M NotificationID: 49^M State: Raise^M<br>Category: Processing Error^M Cause: storageCapacityProblem^M Time: May 30 22:52:44<br>2005ComponentID: /data/qca/^M SpecificProblem: checkDiskSpace() has shown that thereis less<br>than ^M 104857600 bytes available on the local disk.^M Description: More Disk space is required<br>immedietly.^M |

**Table 9 315 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 315                   | Aug 19 22:15:43 wnc0s0qu QCA: _V2_~l=wnc0s0qu~H=wnc0s0qu~A=QCA~S=0001~~ QCA315 NONE<br>FLT wnc0s0qu ^M Location: wnc0s0qu^M Category: processingError^M Cause: fileError^M<br>Time: Aug 19 22:15:43 2004^M<br>ComponentID:/data/qca/20000/output/active//data/qca/20000/output/active/QCA.QCA.QoS.2004.08.19_<br>22.12_EDT.xml^M SpecificProblem: Active file:<br>/data/qca/20000/output/active/QCA.QCA.QoS.2004.08.19_22.12_EDT.xmlhas been<br>removed/deleted.^M Description: Data may have been lost. Creating new file, and attempting to write<br>records again. Failure to do so will result in QCA shutdown.^M |

**Table 10 322 Message**

| <b>Report Message</b> |                                                                                                                                                                                                                                                                                                                      |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #                     |                                                                                                                                                                                                                                                                                                                      |
| 322                   | Aug 19 22:15:43 wnc0s0qu QCA: _V2_~l=wnc0s0qu~H=wnc0s0qu~A=QCA~S=0004~~ QCA322 NONE<br>INFO wnc0s0qu ^M Location: wnc0s0qu^M Category: communications^M Time: Aug 19<br>22:15:43 2004^M ComponentID: GWC-17^M SpecificProblem: New GWC<br>connection^MDescription: New connection from GWC-17. Sequence Number = 1^M |

**Table 11 399 Message**

| Report Message<br># |                                                                                                                                                                                                    |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 399                 | Aug 18 06:49:08 wnc0s0qu QCA: _V2_~l=wnc0s0qu~H=wnc0s0qu~A=QCA~S=0087~~ QCA399 NONE<br>INFO wnc0s0qu ^M Location: wnc0s0qu^M NotificationID: 49^M State: Cleared^M Time:<br>Aug 18 06:49:08 2004^M |

**Note:** (There is no changes in Alarms as a result of feature A00008338)

There are 3 different Types of Alarms uniquely identified by the Notification ID:

- Notification ID: 9  
Event: Client is sending Records with unsupported Length.  
Raise Severity (Major or Minor)  
Raise Customer Log Report Number: QCA 301  
Clear Severity: (None)  
Clear Customer Log Report Number: QCA 399.
- Notification ID: 57  
Event: Client is sending Records with unsupported Version.  
Raise Severity (Major or Minor)  
Raise Customer Log Report Number: QCA 301  
Clear Severity: (None)  
Clear Customer Log Report Number: QCA 399.
- Notification ID: 49  
Event: Critical/Major/Minor Disk Space issue.  
Raise Severity (Critical, Major or Minor)  
Raise Customer Log Report Number: QCA 310.  
Clear Severity: (None)  
Clear Customer Log Report Number: QCA 399.

#### Example of Raise/Clear Alarms:

**Table 12 301 Message- Raise**

| Report Message<br># |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 301                 | May 31 07:37:20 india1sesm QCA: _V2_~l=india1sesm~H=india1sesm~A=QCA~S=0001~~ QCA301<br>MINOR FLT india1sesm ^M Location: india1sesm^M NotificationID: 9^M State: Raise^M<br>Category:Processing Error^M Cause: corruptData^M Time: May 31 07:37:20 2005^M ^M<br>ComponentID: GWC99^M SpecificProblem: The QCA has received records with 1 length errors from<br>the source.^M Description: If 10 (or more) records with unsupported length^M are received<br>consecutively, Major fault log is generated^M and the connection is closed.^M |



**Table 13 399 Message- Clear**

| <b>Report Message #</b> |                                                                                                                                                                                                             |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 399                     | May 31 07:39:47 india1sesm QCA: _V2_~l=india1sesm~H=india1sesm~A=QCA~S=0001~~ QCA399<br>NONE INFO india1sesm ^M Location: india1sesm^M NotificationID: 9^M State: Cleared^M<br>Time: May 31 07:39:47 2005^M |

## Appendix B- Increasing the size of a file system on a Sun server

### *Application*

Use one of the following procedures to increase the size of a file system on a Succession Server Platform Foundation Software (SSPFS)-based server:

- Simplex configuration (one server)
- High-availability configuration (two servers)

It is recommended you perform this procedure during off-peak hours.

The Succession Server Platform Foundation Software (SSPFS) creates file systems to best fit the needs of applications. However, it may be necessary to increase the size of a file system.

Not all file systems can be increased. The table below lists the file systems that cannot be increased, and lists examples of those that can be increased.

### **SSPFS file systems**

Cannot be increased

Can be increased (examples)

/ (root)

/data

/var

/opt/nortel

/opt

/data/oradata

/tmp                                      /audio\_files

/PROV\_data

/user\_audio\_files

/data/qca

/data/mg9kem/logs

During the time file systems are being increased, writes to the file system are blocked, and the system activity increases. The more size that is added to the file system, the greater the impact on performance.

### ***Prerequisites***

Before you perform this procedure, verify that the file system is full or nearly full and that its content is valid application data. Remove any unneeded files or files generated in error that could be taking up disk space.

### **Action**

Perform the following steps to complete this procedure.

#### **Simplex configuration (one server)**

*At your workstation*

1> Telnet to the Sun server by typing

    > telnet <server>

    and pressing the Enter key.

    where

        server

        is the IP address or host name of the Sun server that has the file system you want to increase

2> When prompted, enter your user ID and password.

3> Change to the root user by typing

```
$ su - root
```

and pressing the Enter key.

4> When prompted, enter the root password.

5> Access the command line interface by typing

```
# cli
```

and pressing the Enter key.

Example response

Command Line Interface 1 - View

2 - Configuration

3 - Other

X - exitselect -

6> Determine which file system to increase by checking the current disk capacity utilization as follows:

a> Enter the number that corresponds to the “View” option in the menu.

Example response

View 1 - sspfs\_soft (Display Software Installation Level Of SSPFS) 2 - chk\_sspfs (Check SSPFS Processes) 3 - sw\_conf (The software configuration of the znc0s0jx) 4 - cpu\_util (Overall CPU utilization) 5 - cpu\_util\_proc (CPU utilization by process) 6 - port\_util (I/O port utilization) 7 - disk\_util (Filesystem utilization) X - exitselect -

b> Enter the number that corresponds to the “disk\_util” option in the menu.

Example response

7> Determine the appropriate size for the file systems based on your specific needs.

8> Exit each menu level of the command line interface to eventually exit the command line interface, by typing

```
select - x
```

and pressing the Enter key.

9>

#### ATTENTION

Once you increase the size of a file system, you cannot decrease it.

Increase the size of the file system by typing

```
# filesystems grow -m <mount_point> -s <size>{m,g}
```

Where

mount\_point

is the name associated with the file system

- /data
- /opt/nortel
- /data/oradata
- /PROV\_data
- /audio\_files
- /user\_audio\_files
- /data/qca
- /data/mg9kem/logs

size

is the size in megabytes (m) or gigabytes (g) you obtained in step 7

Example# filesystems grow -m /data/qca -s 512m

Note: The example above increases the "/data" file system by 512 megabytes (MB).

10> You have completed this procedure.

### ***High-availability configuration (two servers)***

#### **ATTENTION**

During this procedure, the cluster will be running without a standby node. The duration is estimated at approximately one hour.

#### ***At your workstation***

1> Telnet to the inactive node of the server cluster by typing

```
> telnet <server>
```

and pressing the Enter key.

where

server

is the physical IP address of the inactive node in the server cluster

2> When prompted, enter your user ID and password.

3> Change to the root user by typing

\$ su - root

and pressing the Enter key.

4> When prompted, enter the root password.

5> Ensure the cluster is in a good state as follows:

a> Run the udstat command by typing

# udstat

and pressing the Enter key.

If the system response contains “nodaemon”, “offline”, “down”, “not mounted”, contact your next level of support. Otherwise, proceed to the next step.

b> Run the ubmstat command by typing

# ubmstat

and pressing the Enter key.

If the system response is other than “ClusterIndicatorSTBY”. contact your next level of support. Otherwise, proceed to the next step.

c> Run the CheckConfiguration command by typing

# CheckConfiguration

and pressing the Enter key.

If the system response is other than “Checking local cluster configuration against <other node>”, contact your next level of support. Otherwise, proceed to the next step.

*At the Inactive node*

6>

#### ATTENTION

Once you increase the size of a file system, you cannot decrease it.

Increase the size of the desired file system by typing

```
# GrowClusteredFileSystem.ksh <mount_point> <size>{m,g}
```

Where

mount\_point

is the name associated with the file system, for example

- /data
- /opt/nortel
- /data/oradata
- /PROV\_data
- /audio\_files
- /user\_audio\_files
- /data/qca**
- /data/mg9kem/logs

size

is the size in megabytes (m) or gigabytes (g)

Example# GrowClusteredFileSystem.ksh **/data/qca** 10m

Note: The example above increases the “/data/qca” file system by 10 megabytes (MB).

7> Reboot the Inactive node by typing

```
# init 6
```

and pressing the Enter key.

8> Wait for the Inactive node to reboot, then log in again using its physical IP address.

9> Telnet to the active node of the Sun server cluster by typing

```
> telnet <server>
```

and pressing the Enter key.

where

server

is the physical IP address of the active node in the Sun server

cluster

10> When prompted, enter your user ID and password.

11> Change to the root user by typing

```
$ su - root
```

and pressing the Enter key.

12> When prompted, enter the root password.

At the Active node

13> Stop the cluster by typing

```
# StopCluster
```

and press the Enter key.

This action causes a cluster failover and makes the active node inactive, and the inactive node active.

At the newly Active node

14> Clone the other node using procedure Cloning the image of one node in a cluster to the other node on page 9 in this document.

15> You have completed this procedure.

## ***Product = CS 2000***

### **Q00720293--Change in SWREL value**

#### **13.1 Applicable Solution(s)**

All

#### **13.2 Description of change**

Office parameter SITELABELINFO in table OFCVAR controls the SWREL (Software Release) value. The default value is derived from the actual product load of the switch, i.e. SNxx. Effective with SN07, the software release value is no longer NCSxx/UCSxx, but is now SNxx. The SWREL value is used in the Block Header record when writing CDR records to DIRP files. It is also passed to the SDM and CBM when using SBA billing.

The SWREL value is not transferred with an ONP as are the SITEID and SITELOC portions of SITELABELINFO. To check the value for a software load, use the IMAGENAME command. Once the ONP has completed, the customer may change the default SWREL value if desired.







# SN08 Feature Deltas

***Product = CS 2000 Compact***

## **A00008431--System Masterhip Support for CS2Kc Geo Survivability Configuration**

***Functional Description***

### **1.1 Applicable Solution(s)**

PT-IP, UA-IP, IAC, IAW, CHS, PT-AAL2

### **1.2 Description**

This activity supports the Geographic Survivability configuration of the CS 2000 - Compact by modifying the mastership selection algorithm to obtain better performance during disaster scenarios.

The Geographic Survivability configuration splits the control components between 2 physically separate sites, using a highly available Optical transport system to connect the 2 sites.

In steady state, each of the components maintains communication with its mate in the other site, and they decide and negotiate activity between the two components using their existing mastership algorithm. This is the default behaviour when communications are up between the two sites, and maintains the current non-Geographic Survivability behavior when inter-building communications is present.

The enhanced mastership algorithm is used primarily in disaster scenarios, that is, when the communications between the buildings is lost, or either an entire site, or portions of it are down. The mastership algorithm detects what portions of the system are still active and reconfigures the system in an optimal mode to maintain services with the remaining inservice components.

The Geographic Survivability mastership algorithm spans the following components:

- CCA - Compact Call Agent - the master node in the algorithm
- GC - Gateway Controller
- USPc - Universal Signalling Point-Compact

Other components, while redundant, are not configured with components on both sites. These are:

- CMT & IEMS: both HA units configured on site A. Standby unit prepared on site B.
- CBM: both HA units configured on site B. Standby unit prepared on site A.
- Session Server and Policy Server: both units configured on single site

The SAM21 Manager GUI has a Geographic Survivability tab to allow configuration of the backup WAN path between the CS 2000 - Compact cards. Configuration of Call Agent interactions with the local ERS 8600 in each site is configured on each Call Agent blade using the setgeoconfig script tool.

The recommended CS-LAN router is the ERS 8600, dual processor version in each site. The CA is able to interact with the ERS 8600 in ring down scenarios, disabling OSPF on the inactive site, and thereby improving the call completion rate.

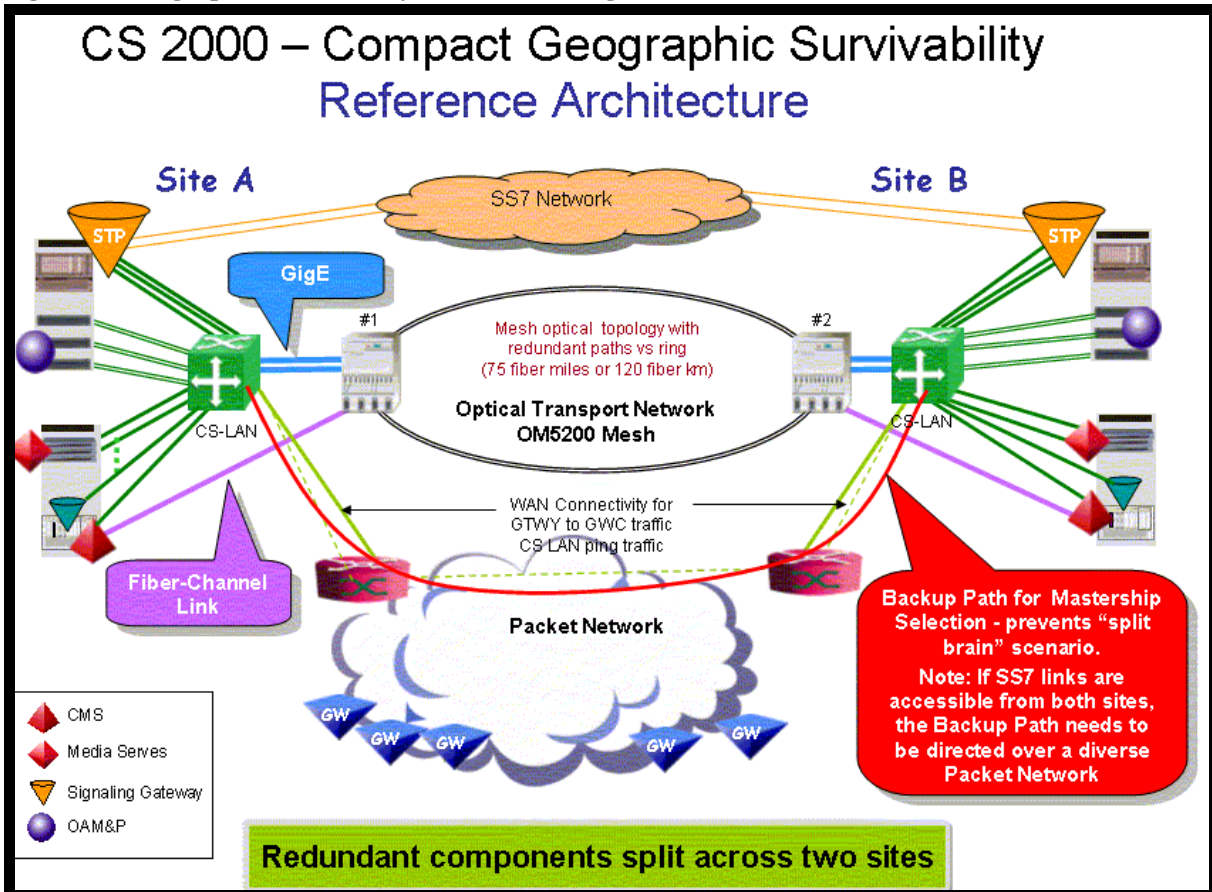
Other routers may be used, but the CA can only interact with the ERS 8600 to disable OSPF at this time.

### **1.2.1 Reference Configuration**

The Geographic Survivability reference configuration consists of the principal core components split into 2 separate physical sites, which are connected via optical equipment. Although line gateways, trunk gateways and RTP Media Portals may be present at either of both of the CS 2000 - Compact Call Agent sites, they are not survivable in the event of a site disaster.

An example configuration is shown here for help in reviewing this document.

Figure 1 Geographic Survivability Reference Configuration



### 1.2.1.1 Key components of the Geographic Survivability configuration

- Main callp and oam control components split between two geographically separate sites (i.e. CA, GWCs, USPc, CICM).
- Highly survivable Optical connections (Ring or Mesh) between the two main control sites.
- Ethernet connectivity extended over the optical ring between the Ethernet Routing Switch 8600s in each site. CALLP and OAM subnets exist transparently between the two sites.
- Fiber Channel (FC) connectivity extended over Optical for the inter-Call Agent FC connection.
- IP WAN Gateway connections from each site. Configured separately from the optical ring.
- SS7 connectivity from each site to the SS7 network. Normally operates in load sharing mode.

- Backup path configured via WAN, separately from optical network for maximum redundancy.
- CMT/IEMS and CBM are configured in HA mode, with both units on the same site. For maximum OAM redundancy, the CMT/IEMSs and CBMs are configured on opposite sites. In case of a disaster scenario where one of the sites is unavailable for an extended period of time (days or more), additional hardware is pre-installed in each site which is recovered to a temporary CBM or CMT/IEMS via a manual recovery procedure.

It is important to note that not all components in the network are Geographically Survivable. The main core components are Geographically Survivable, but typically the access GWs are single units, and exist externally to both sites, close to the access point.

The core components in the Geographic Survivability configuration, categorized by type appear in the following table:

**Table 1 Categorized core components**

| Type                   | Component      | Geo Survivable                | Comment                                                                                                          |
|------------------------|----------------|-------------------------------|------------------------------------------------------------------------------------------------------------------|
| HA Pair<br>(Act/Inact) | CCA            | Yes                           | Master node in Geographic Survivability algorithm. Data sync across FC/Optical ring.                             |
|                        | GWC            | Yes                           | Data sync across ring                                                                                            |
|                        | CICM           | Yes                           |                                                                                                                  |
|                        | CBM            | Recoverable on standby server | HA configured in site B. (Standby server configured in Site A)                                                   |
|                        | CMT/IEMS       | Recoverable on standby server | HA configured in site A. (Standby server configured in Site B)                                                   |
|                        | SC             | N/A                           | 2 units control a specific shelf. Call Control shelves are geo-survivable as there is at least 1 shelf per site. |
|                        | Session Server | No                            | Not Geo Survivable in SN08. Configure both units in single site.                                                 |
|                        | Policy Server  | No                            | Not Geo Survivable in SN08. Configure both units in single site.                                                 |
| Load Shared            | USPc           | Yes                           | Load shared. 1 unit in each site. Geo Survivable with single unit.                                               |
|                        | MC             | No                            | Load shared units in single site only. CS 2100 Hybrid solution only.                                             |
|                        | MS2010         | Yes                           | N units at each site, where N meets engineered requirements.                                                     |
|                        | Storm-IA       | No                            | 2 separate units, 1 per site.                                                                                    |

### 1.2.2 Behaviour Overview during Failure scenarios

The goal of the Geographic Survivability algorithm is to detect and react to failure scenarios, to keep the maximum amount of equipment in service, during single or multiple fault scenarios.

To concentrate the majority of the decision making in a single place during failure scenarios, a master was chosen among the components (the CA). The master monitors multiple network connections, and has an additional backup link to its mate that are not available to the other components during optical ring failure.

Overall, the Geographic Survivability mastership algorithm works as follows:

- Algorithm spans both master (CA) and other components.
- Normal operations for master and other components: mates in contact with each other and negotiate activity and services between them.
  - This means that activity for the different components will generally be spread across both sites in normal operation.
- The master monitors several connections with its mate, and several connections with other components in order to determine the state of the overall system.
  - Mate to mate connections monitored are:
    - normal ethernet via ERS 8600 and optical,
    - backup FC link via optical (but not ERS 8600), and
    - backup WAN link via ERS 8600 and WAN, but not optical.
  - Master to network connections monitored are:
    - Master to local ethernet (ping local SC)
    - Master to local WAN edge
- Master uses WAN backup path separate from Optical link to negotiate activity if optical goes down. Only the master has access to this backup link.
- If no master mate connectivity present, master uses connection to WAN edge to determine whether to go/stay active or inactive. Assumes one or other of the locations is isolated.

This includes an assumption that the GWs (apart from those co-located in the bldg) are accessible via the WAN connection.
- When non-master mates lose connectivity with each other, they verify if they have connectivity to active master (CA). They follow the master activity during isolation.
  - During isolation, one building will become active, the other inactive based on the master activity.

- The master to non-master communications rely on the non-master detecting loss of connectivity with the master node.

Summary of system behaviour during various failure scenarios.

**Note:** These scenarios do not include the OAMP configuration. The OAM&P configuration is described in more detail in section “1.2.6 OAM&P configuration” on page 1509.

**Table 2 System Behaviour Summary**

| Scenario                           | Expected Behaviour                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ERS 8600 failure in Bldg A.        | <p>All components lose mate connectivity via ethernet. CA also loses WAN backup connectivity. FC backup should remain up.</p> <p>Bldg B CA will remain active if already active. No outage.</p> <p>If Bldg B CA was not active, it will take activity within about 2 sec. SOS goes through WARM or COLD restart (about 30 secs).</p> <p>Bldg A CA will detect IST loss, but will not be able to disable OSPF since ERS 8600 down.</p> <p>Other components are expected to go active in Bldg B, following CA activity after losing mate connectivity.</p> <p>USPc in Bldg A detects isolation and takes down side A SS7 links.</p> |
| Optical Frame failure in Bldg A    | <p>All components lose mate connectivity via ethernet. CA also loses FC backup connectivity. WAN backup should remain up.</p> <p>Active CA will remain active, but without sync. No outage. (Assume active is in Bldg A for remaining discussion). Bldg B CA will detect IST loss, and disable OSPF in bldg B.</p> <p>Other components are expected to go active in Bldg A, and inactive in Bldg B, follow CA activity after losing mate connectivity.</p> <p>USPc in Bldg B detects isolation from Active CA, and takes down Bldg B SS7 links.</p>                                                                               |
| Bldg A lost                        | <p>All components in Bldg B lose mate connectivity. CA loses all mate connectivity including backups. CA loses sync.</p> <p>Bldg B CA will remain active if already active. No outage.</p> <p>If Bldg B CA was not active, it will take activity within about 2 sec. SOS goes through WARM or COLD restart (about 30 secs).</p> <p>Bldg A gone. Nothing happens there. SS7 network takes down links to site A.</p> <p>Other components are expected to go active in Bldg B, following CA activity after losing mate connectivity.</p>                                                                                             |
| CA card fails Bldg A (when active) | <p>All components in both sites can still see their mates. No change required.</p> <p>CA in Bldg B (inact) detects loss of connectivity with mate. Detects local and WAN connectivity. Takes activity, performing SOS restart.</p> <p>Other components will experience disconnection with SOS for about 30 secs. (Normal restart behavior)</p>                                                                                                                                                                                                                                                                                    |

**Table 2 System Behaviour Summary**

| Scenario                                               | Expected Behaviour                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CA card fails Bldg A (when inactive)                   | All components in both sites can still see their mates. No change required.<br><br>CA in Bldg B (act) detects loss of connectivity with mate. Detects local and WAN connectivity. Stays active. No switch of activity required. No restart required.                                                               |
| Recovery from Isolation Split Brain (Act/Act) scenario | During Recovery: Once CAs can talk to mate, they recognize that both are active. The one which was inactive previously backs down, leaving the other active. The fallout is to force unit 0 active, unit 1 inactive.<br><br>Other components talk to their mates, negotiate activity and resume normal operations. |

### 1.2.2.1 System impact of failure scenarios

Reacting to certain failure scenarios may cause a system impact. These are described below:

- When negotiating activity, the CA preference is always to remain on the same side, if this side supports activity.
- If failover of the CA is necessary, the CA switches activity in less than 2 secs, however there is a call processing interruption of approximately 30 seconds while the Callp Application performs a restart.
- If failover of other Callp nodes is necessary, they follow the CA within 2 secs.

### 1.2.2.2 Hybrid Configuration

In the CA Hybrid configuration, supported only in the Enterprise CS 2100 product, where the solution contains MC cards connected to Message Switches, supporting TDM peripherals, the MC cards and Message Switches are co-located in one of the principal Geographic Survivability sites. The behavior described above is modified in the following ways:

- During building isolation, when determining the appropriate master site, preference is given to the site containing the MC cards (assuming it is able to take activity). If necessary, activity is switched to this side during the activity negotiation.

## 1.2.3 Recovery Behaviour

A very important part of the algorithm is the recovery aspects. In general, the recovery portion of the algorithm works as follows:

- All components, regardless of their activity state, continually monitor connections with their mate, and with other network components that they normally communicate with. When connectivity is not present, they continue to monitor the connections, waiting for connectivity to return.
- All components negotiate activity and services when connectivity recovers, and resume normal operations.



### **1.2.3.1 System impact of recovery scenarios**

In general, recovery scenarios have less system impact than failure scenarios. However, reacting to certain recovery scenarios may cause a system impact. These are described below:

- When negotiating activity, the CA preference is always to leave activity on the same side. When recovering to a full system configuration, activity remains on the same unit, without impact.
- If recovering from a split system where confusion was introduced into the system due to incorrect message routing, while the activity of the nodes will be resolved within a few seconds, it may take up to 15 mins before all call processing has completely recovered.

### **1.2.4 Geographic Survivability Mode Configuration**

In SN08, it is necessary to configure Geographic Survivability mode as part of installation and commissioning of the new Geographic Survivability office.

- Configure the Backup path vlans and filtering on the CS-LAN.
- Configure the CCA access account, permissions etc on the ERS 8600.
- When configuring the CA cards in the EM GUI, fill in the Geographic Survivability portion of the panel, and include the IP addresses for the GEO WAN backup link.
- Use the setgeoconfig script tool to configure the interactions with the local ERS 8600, on each CA interface.

### **1.2.5 WAN backup path**

An important component of the reliability of the Geographic Survivability algorithm is the WAN backup path configured to go via the WAN. This link has several important attributes:

- It is only used by the CA for mate to mate communication; not by any other network component.
- It is configured separately from the optical network, thus it provides an additional path which can stay up if the optical network completely fails.
- It routes packets via the external IP network, rather than over the Optical network.
- It is monitored continually, and alarmed if it goes down.

#### **1.2.5.1 Backup Link Security**

It is noted that:

- Information is exchanged over the IP network between the 2 CA units.
- The Call Agent IP addresses are visible on the external network.
- The messages are unencrypted and unauthenticated.



- Status/control information is exchanged over this link in certain conditions, which is used to determine CA activity.

The security risks are mitigated by the following:

- In normal operation, when the Optical ring is insv, only ping messages are exchanged over the IP network (no control information). This is used simply to monitor the state of the link.
- Status/Control messages are discarded if they arrive on the backup link, while the other links are still up. Only if the other links are down, are status/control messages from the mate used to decide on activity.
- ERS 8600 filters enabled to only allow packets to be received from the mate IP address, and on the single port used for mate communication.
- Msg Rate filtering is configured on the ERS 8600 to minimize the impact of a denial of service (DOS) attack on the CA IP addresses.

### 1.2.6 OAM&P configuration

The OAM components CMT, IEMS, CBM are in HA mode on one site with a standby server at the other site.

#### 1.2.6.1 CBM accesibility

The CBM will be inaccessible during certain failure scenarios:

- Ethernet IST down (ring down) between sites, with site B core inactive (due to OSPF disable) when using ERS 8600 routers.
- Loss of site B

For various failure scenarios, the following table lindicates the impacts to CBM applications for the duration of the condition (if the optical ring is down) or until restoration of the CBM applications on the standby server (if site B is lost).

**Table 3 CBM functionality during fault conditions**

| CBM Application/Function | Description                                                                                                                                                  | CMT/IEMS Site A lost | CBM Site B lost | Ring down, Core on Site A | Ring down, Core on Site B                     |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------------|---------------------------|-----------------------------------------------|
| Fresh Install            | Ultimate recovery mechanism, or to prep standby unit on site A. Needs to have both Core and CMT INSV/ Accessible to complete installation and commissioning. | NA                   | OK              | OK                        | Cannot talk to Core to complete commissioning |

**Table 3   CBM functionality during fault conditions**

| <b>CBM Application/<br/>Function</b> | <b>Description</b>                                                                                                          | <b>CMT/IEMS<br/>Site A lost</b> | <b>CBM Site B<br/>lost</b>                    | <b>Ring down,<br/>Core on Site<br/>A</b>                                     | <b>Ring down,<br/>Core on Site<br/>B</b>                                     |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Bootp server                         | Tells booting nodes where to tftp to obtain boot loads.<br>Note: CMT is redundant bootp server.                             | OK                              | OK                                            | OK                                                                           | OK                                                                           |
| Tftp server for boot loads           | Supplies load to booting node, when unavailable from the element's flash memory.                                            | CICM cannot boot                | All CA, sc, gwc and audio servers cannot boot | Site B CICM cannot boot.<br>Site A CA, sc, gwc and audio servers cannot boot | Site B CICM cannot boot.<br>Site A CA, sc, gwc and audio servers cannot boot |
| Secure Terminal Access / Passthrough | Terminal access to the CBM server and passthrough capabilities through the CBM to the Core with standard SSH/telnet clients | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| File Transfer Service                | FTP Daemon for Core Access                                                                                                  | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| FTP Proxy                            | Ability to FTP directly to Core from Client Machine                                                                         | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| SSH Core Transfer                    | SSH File Transfer directly to Core from Client Machine                                                                      | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| OM Access Service                    | Obtains OM from Core                                                                                                        | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| Table Access Service                 | Provides Data Dictionary files to other CBM applications (OM, SBA etc.)                                                     | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| Generic Data Delivery                | Obtains real time logs from Core                                                                                            | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |
| Log Delivery Service                 | Feeds real time Core and CBM logs to NOC for status and action.                                                             | OK                              | Unavailable                                   | Unavailable                                                                  | OK                                                                           |

**Table 3   CBM functionality during fault conditions**

| <b>CBM Application/<br/>Function</b>         | <b>Description</b>                                                                                                                                                  | <b>CMT/IEMS<br/>Site A lost</b> | <b>CBM Site B<br/>lost</b>                                                                          | <b>Ring down,<br/>Core on Site<br/>A</b>                      | <b>Ring down,<br/>Core on Site<br/>B</b> |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|
| SDM Billing Application                      | Reliable store and forward of Core billing records using FTP, supports real-time-delivery and stores data in DNS or DIRP files.                                     | OK                              | Unavailable, new billing records backed up to Core for short term, unprocessed records on CBM lost. | Unavailable, billing records backed up to Core for short term | OK                                       |
| Passport Log streamer                        | Consolidate ERS 8600 logs from the MDM EMS into the Log Delivery OSS feeds.                                                                                         | OK                              | Unavailable                                                                                         | Unavailable                                                   | OK                                       |
| OSS and Application Svcs                     | The DMS Data Management System (DDMS) provides the Operation Support System Data Interface (OSSDI) interface for accessing DMS provisioning data. (Required by CMT) | OK                              | Unavailable                                                                                         | Unavailable                                                   | OK                                       |
| DMS Maintenance Application                  | DMA provides an interface for line and trunk maintenance actions on the Core.                                                                                       | OK                              | Unavailable                                                                                         | Unavailable                                                   | OK                                       |
| GR740 Pass Through                           | Provides TCP/IP GR-740 interface to the core for a network data collection operations system (NDC OS)                                                               | OK                              | Unavailable                                                                                         | Unavailable                                                   | OK                                       |
| Base Maintenance Interface                   | Provides a generic maintenance interface to receive notifications of states changes, query states and request maintenance actions of CM maintained components.      | OK                              | Unavailable                                                                                         | Unavailable                                                   | OK                                       |
| Lawful Intercept (International Market Only) | Provides detailed call information for law enforcement officials                                                                                                    | OK                              | Unavailable                                                                                         | Unavailable                                                   | OK                                       |

### 1.2.6.2 Backup Access when CBM unavailable

When access via the CBM is unavailable due to failure conditions, the recommended method to connect to the Core or other nodes on either site is via telnet through the CS-LAN router.

- Telnet to the ERS 8600 can be used as a starting point. Once access is gained to the ERS 8600, access from there can be gained to the OAM and CallP devices. Since the ERS 8600 supports multiple telnet sessions, access to multiple devices can be gained using this strategy.
  - Telnet to the IP of the ERS 8600.
  - Login as a user with r/w privileges
  - Telnet to the core or other node using the IP address of the node.
- This assumes that network connectivity is available between the NOC and site.
- To minimize the impacts of having OSPF disabled on the inactive site during certain failure scenarios, it is recommended to connect to the Circuitless IP for the CS-LAN router, which is outside the IPs used for OAMP access (and is not affected by OSPF disable).

### 1.2.6.3 CMT/IEMS accessibility

The CMT/IEMS will be inaccessible during certain failure scenarios:

- Ethernet IST down (ring down) between sites, with site A core inactive (due to OSPF disable) when using ERS 8600 routers.
- Loss of site A

When the CMT/IEMS is inaccessible the following services are retained:

- Call processing
- CBM functions for transfer of billing records, core logs and core OMs downstream and as the bootp load repository

The following CMT/IEMS resident services are unavailable:

- OA&M functions of the CS 2000 Management Tools and IEMS - GUI access, element management, alarms, non-core logs
- Access to the CS 2000 Compact Core Manager on the CBM (craft would be able to telnet to the CBM and from there access the Call Agent)

During an extended CMT/IEMS outage, the following recovery actions are recommended:

- Bring the standby Sun server(s) at Site B into service as the CMT and IEMS

**Note:** Requires manual intervention – roughly 2 to 3 hours once personnel are on site

The following is a detailed list of services which are not available during a period of CMT/IEMS inaccessibility:

- alarm reporting northbound
- alarm collection from NEs
- log collection from NEs
- log reporting northbound
- provisioning functions
- visibility to NEs (SC, GWC)
- GUI access (very similar to line above)
- maintenance actions on NEs (bsy/rts, lock/unlock etc)
- table access via the CBM
- QCA data collection
- OM collection
- OM push functions
- NTP services to NEs
- line maintenance function
- trunk maintenance functions
- proxy connections to Storm, USPc, Session Server ( devices can not be accessed)

### 1.3 Hardware Requirements or Dependencies

Single ERS 8600 (dual processor) in each site, is the only router which supports interactions with the CA for OSPF disable. When the ERS 8600 is used, then an IST link must be configured across optical equipment between sites.

Enhanced GFSRM optical cards used for FC link between sites.

### 1.4 Software Requirements or Dependencies

SN08 loads for all components.

CMT/IEMS and CBM are HA versions.

### 1.5 Limitations and restrictions

This activity only addresses the mastership enhancements required for Geographic Survivability. It does not address other requirements of Geographic Survivability, including the optical requirements for syncing and communications over the distance required in the POR, or inservice upgrades from non-Geographic Survivability to Geographic Survivability configurations.

- In Hybrid configurations (with TDM equipment homed at 1 site), the TDM equipment is not Geo Survivable. Preference is given to the TDM side, only when either side can support callp. If necessary, a swact will be performed to the TDM side in order to allow callp on TDM side.

Geographic Survivability Hybrid is supported only in Enterprise (CS2100) solutions.

- Due to the necessity for the CA to interact with the ERS 8600, this activity requires that there be only a single ERS 8600 per site, with IST links configured between sites. Dual ERS 8600s per site are not supported nor are SMLT links between sites. Enterprise upgrades from previous releases in Geographic Survivability configuration (which have dual ERS 8600s per site) require that the dual ERS 8600s be migrated to a single ERS 8600 per site.
- Other routers can be used for the CS-LAN, but the geographic survivability interactions with the call agent are only supported on the ERS 8600. If another router is used, the following limitations are in effect:
  - OSPF will not be disabled automatically on the inactive site when Ethernet connectivity is down between sites -- this will lead to additional call failures due to misdirected messages.
  - It may also lead to extended recovery times after the failure condition is removed.
- In cases of total communication loss between the two sites (i.e. all 3 master links), activity decision cannot be negotiated between the 2 call agents, and will be made based on connectivity check from each site to the WAN network.
  - While very unlikely, it could be possible to have an active/active (i.e. split brain) scenario, or an inactive/inactive scenario (no processing).
  - The WAN backup path was chosen as a method of mitigating the risk of the optical ring failure. The WAN connection check helps resolve activity when even the backup path is down.
- CS 2000 - Compact supports only a single time zone setting; if the two physical sites are in different time zones, then it is recommended to set the timezone to either GMT or the timezone of one of the sites.
- Session Server and Policy Server plans no mastership changes in SN08. Both Session Server and Policy Server units will be homed on 1 site.
- Geographic Survivability requires a WAN backup path configured separately from the Optical network for maximum redundancy.
  - dedicated vlan configured on each ERS 8600 for use by backup path only
  - vlans route via the WAN network, not over the optical ring
  - vlans are not disabled with OSPF disable
  - lack of connectivity is alarmed
- In general, the gateways and services node components of CS 2000 - Compact are single units, and not geographically survivable. Depending

on where these nodes are located and how they are connected to the network impacts whether they survive any particular failure. Although the same nodes are supported in Geographic Survivability and non-Geographic Survivability config, there is no anticipated change in configuration or connection in the Geographic Survivability configuration.

## 1.6 Interactions

## 1.7 Applicable customer facing sections

### Fault Management

Logs \_\_X\_\_

Alarms \_\_X\_\_

### Configuration

Data Schema \_\_N/A\_\_

User Interface \_\_X\_\_

Element Management \_\_X\_\_

Security \_\_N/A\_\_

Service Order \_\_N/A\_\_

Office Parameters \_\_N/A\_\_

Accounting (includes AMA billing) \_\_N/A\_\_

Performance (includes operational measurements) \_\_N/A\_\_

## 1.8 Glossary

| Term      | Description          |
|-----------|----------------------|
| CA or CCA | Compact / Call Agent |
| MC        | Message Controller   |

## 2: Fault Management for A00008431

### 2.1 Fault management strategy

The CS2000 - Compact in Geographic Survivability mode has extensions to the alarm strategy to support alarming additional connections monitored in Geographic Survivability mode. Specifically, the Call Agent (CA) monitors connectivity to its mate CA via the WAN backup path. Additionally, the CA monitors connectivity to the local wan edge router used to connect to the

WAN. These additional connections are also described in existing connectivity logs, when in Geographic Survivability mode.

New logs in Geographic Survivability mode are used to show interactions with the local Ethernet Routing Switch 8600 (where used). OSPF is disabled on the CALLP and OAM vlans on the inactive call agent site in the case of optical and ethernet isolation between sites. Specifically, information logs are output as OSPF is enabled or disabled by the CA.

## 2.2 Fault management tools and utilities

No special fault management tools.

Alarms are available from the alarm command at the coremtc map level of the ccamtc map.

Logs are available from the logquery command at the coremtc map level of the ccamtc map.

## 2.3 New Logs CCA685 & CCA686

### 2.3.1 Explanation

Log Title: CCA685

Name: CCA Geo OSPF Disable

Description: The CCA disabled OSPF in the local ERS 8600.

Event type: Info

### 2.3.2 Explanation

Log Title: CCA686

Name: CCA Geo OSPF Enable

Description: The CCA enabled OSPF in the local ERS 8600.

Event type: Info

### 2.3.3 Format

CCA685 JAN11 12:38:05 INFO OSPF Disabled

Unit Number: 1, INACTIVE

Description: Open Shortest Path First routing protocol disabled on the local default gateway.

CCA686 JAN11 14:26:05 INFO OSPF Enabled

Unit Number: 0, ACTIVE



Description: Open Shortest Path First routing protocol enabled on the local default gateway.

### 2.3.4 Field descriptions

**Table 1** Field descriptions

| Field       | Value              | Description                     |
|-------------|--------------------|---------------------------------|
| Unit Number | 0 or 1             | The CCA unit number             |
| Activity    | ACTIVE or INACTIVE | The activity state of this unit |

### 2.3.5 Action

No action required; this is an INFO only log.

For CCA685 - OSPF Disable log, this indicates that OSPF routing has been disabled on the local ERS 8600. This will only happen on the Inactive unit when the Ethernet connectivity or Optical Ring goes out of service between sites. This system action improves the ability of outside nodes to route to the remaining active call agent site.

### 2.3.6 Associated Operational Measurements or Performance Measurements

None

### 2.3.7 Additional information

None

## 2.4 Changed Logs CCA331 CCA335 CCA336 CCA631 CCA635 CCA636

These logs have an enhanced *Description* when in Geographic Survivability mode, giving details of the connection states being monitored. The description format is the same for each of these logs, although the fields differ depending on the condition being logged.

When not in Geographic Survivability mode, the logs appear as documented previously.

The following sections describe the logs as seen in Geographic Survivability mode.

### 2.4.1 Explanation

Log Title: CCA331

Name: Mate Connectivity

Description: Indicates a connectivity problem with the mate CCA unit.

Event type: FLT

#### **2.4.2 Explanation**

Log Title: CCA631

Name: Mate Connectivity Restored

Description: Indicates connectivity problem with the mate CCA unit has been resolved.

Event type: INFO

#### **2.4.3 Explanation**

Log Title: CCA335

Name: Link Connectivity

Description: Indicates a link connectivity problem.

Event type: FLT

#### **2.4.4 Explanation**

Log Title: CCA635

Name: Link Connectivity Restored

Description: Indicates a link connectivity problem has been resolved.

Event type: INFO

#### **2.4.5 Explanation**

Log Title: CCA636

Name: Network Connectivity

Description: Indicates a connectivity problem with monitored network connections.

Event type: FLT

#### **2.4.6 Explanation**

Log Title: CCA336

Name: Network Connectivity Restored

Description: Indicates a network connectivity problem has been resolved.

Event type: INFO

## 2.4.7 Format

\*\* CCA335 JAN24 11:23:32 FLT Link Connectivity

Unit Number : 0, INACTIVE

Description : Link0: INSV, mateCon: OK (opt: BAD, wan: OK),  
netCon: OK (local: OK, wanEdge: OK); Link1:  
INSV, mateCon: OK (opt: BAD, wan: OK), netCon:  
OK (local: OK, wanEdge: OK); BLink: SYSB,  
mateCon: BAD; FC: SYSB;

\*\*\* CCA331 JAN24 11:23:35 FLT Mate Connectivity

Unit Number : 0, INACTIVE

Description : Link0: INSV, mateCon: BAD (opt: BAD, wan: BAD),  
netCon: OK (local: OK, wanEdge: OK); Link1:  
INSV, mateCon: BAD (opt: BAD, wan: BAD),  
netCon: OK (local: OK, wanEdge: OK); BLink:  
SYSB, mateCon: BAD; FC: SYSB;

\*\*\* CCA336 JAN24 11:01:13 FLT Network Connectivity

Unit Number : 1, ACTIVE

Description : Link0: INSV, mateCon: BAD (opt: BAD, wan: BAD),  
netCon: OK (local: OK, wanEdge: OK); Link1:  
INSV, mateCon: BAD (opt: BAD, wan: BAD),  
netCon: OK (local: OK, wanEdge: OK); BLink:  
SYSB, mateCon: BAD; FC: SYSB;

CCA635 JAN12 14:38:03 INFO Link Connectivity Restored

Unit Number : 1, INACTIVE

Description : Link0: INSV, mateCon: OK (opt: OK, wan: OK),  
netCon: OK (local: OK, wanEdge: OK); Link1:  
INSV, mateCon: OK (opt: OK, wan: OK), netCon:  
OK (local: OK, wanEdge: OK); BLink: INSV,  
mateCon: OK; FC: INSV;

CCA631 JAN12 14:38:03 INFO Mate Connectivity Restored

Unit Number : 1, INACTIVE

Description : Link0: INSV, mateCon: OK (opt: OK, wan: OK),  
netCon: OK (local: OK, wanEdge: OK); Link1:  
INSV, mateCon: OK (opt: OK, wan: OK), netCon:  
OK (local: OK, wanEdge: OK); BLink: INSV,  
mateCon: OK; FC: INSV;

CCA636 JAN13 10:44:29 INFO Network Connectivity Restored

Unit Number : 0, ACTIVE

Description : Link0: INSV, mateCon: OK (opt: OK, wan: OK),  
netCon: OK (local: OK, wanEdge: OK); Link1:

INSV, mateCon: OK (opt: OK, wan: OK), netCon:  
OK (local: OK, wanEdge: OK); BLink: INSV,  
mateCon: OK; FC: INSV;

## 2.4.8 Field descriptions

**Table 2 Field descriptions**

| Field        | Value              | Description                                                             |
|--------------|--------------------|-------------------------------------------------------------------------|
| Unit Number  | 0 or 1             | The CCA unit number                                                     |
| Activity     | ACTIVE or INACTIVE | The activity state of this unit                                         |
| Description: |                    | Description of Geo mode connection description follows:                 |
| Link0:       | INSV or SYSB       | State of Eth Link 0 connectivity to Router.                             |
| mateCon:     | OK or BAD          | Mate connectivity via Eth Link 0.                                       |
| opt:         | OK or BAD          | Mate connectivity via Eth Link 0 and Ethernet via optical.              |
| wan:         | OK or BAD          | Mate connectivity via Eth Link 0 and WAN.                               |
| netCon:      | OK or BAD          | Composite Network connectivity via Eth Link 0                           |
| local:       | OK or BAD          | Network connectivity to local network (Shelf Controller) via Eth Link 0 |
| wanEdge      | OK or BAD          | Network connectivity to local wan edge router.                          |
| Link1:       | INSV or SYSB       | State of Eth Link 1 connectivity to Router.                             |
| mateCon:     | OK or BAD          | Mate connectivity via Eth Link 1.                                       |
| opt:         | OK or BAD          | Mate connectivity via Eth Link 1 and Ethernet via optical.              |
| wan:         | OK or BAD          | Mate connectivity via Eth Link 1 and WAN.                               |

**Table 2 Field descriptions**

| Field    | Value        | Description                                                             |
|----------|--------------|-------------------------------------------------------------------------|
| netCon:  | OK or BAD    | Composite Network connectivity via Eth Link 1                           |
| local:   | OK or BAD    | Network connectivity to local network (Shelf Controller) via Eth Link 1 |
| wanEdge  | OK or BAD    | Network connectivity to local wan edge router.                          |
| BLink:   | INSV or SYSB | Backup Link state via Fiber Channel                                     |
| mateCon: | OK or BAD    | Mate connectivity via BLnk.                                             |
| FC       | INSV or SYSB | Fiber Channel (FC) state                                                |

**2.4.9 Action**

For CCA335, CCA331, CCA336 FLT logs:

- Use the description info in the logs, or in the corresponding CON alarm to determine the type of connectivity problem. Determine whether this is caused by a maintenance action underway, or by an actual network connectivity fault.
- If due to a network fault, attempt to isolate the connectivity problem.
- If due to a maintenance action, monitor the condition until the maintenance action is completed.

For CCA635, CCA631, CCA636 INFO logs:

- No action is required. These logs indicate a resolution of previously logged and alarmed connectivity problems.

**2.4.10 Associated Operational Measurements or Performance Measurements**

None

**2.4.11 Additional information**

These logs are associated with the CON alarm.

In normal (non-Geo) mode, these logs have a description like the following:

Description: Link0: INSV, mateCon: AVAIL, netCon: AVAIL;  
 Link1: INSV, mateCon: AVAIL, netCon: AVAIL;  
 BLink: INSV, mateCon: AVAIL; FC: INSV;

## 2.5 Alarms

### 2.5.1 CCA CON alarms

The description field of the LnkCon, MatCon and NetCon alarms describes the connectivity map for the monitored connections. In Geographic Survivability mode, the description is extended to show the enhanced connection monitoring. The description fields are identical to the corresponding logs described above.

The alarm severity varies with the number and types of connectivity problems.

Figure 1 shows an example of a MatCon and LnkCon alarms displayed on the CCA map, using the *alarm con* command.

**Figure 1 Example Map showing MatCon and LnkCon alarms**

| CallAgent   | SYS                               | CON      | APPL                                                                                  | Unit: 1 |
|-------------|-----------------------------------|----------|---------------------------------------------------------------------------------------|---------|
| .           | .                                 | MatCon   | .                                                                                     |         |
|             |                                   | M        |                                                                                       |         |
| CAMtc       | CON alarms reported by CA unit 0: |          |                                                                                       |         |
| 0 Quit      | Alarm                             | Severity | Description                                                                           |         |
| 2 Jam       | LnkCon                            | major    | Link0: INSV, mateCon: OK (opt: BAD, wan: OK),<br>netCon: OK (local: OK, wanEdge: OK); |         |
| 3 RelJam    |                                   |          | Link1: INSV, mateCon: OK (opt: BAD, wan: OK),<br>netCon: OK (local: OK, wanEdge: OK); |         |
| 4 REXtst    |                                   |          | BLink: SYSB, mateCon: BAD;                                                            |         |
| 5 SwAct     |                                   |          | FC: SYSB;                                                                             |         |
| 6           |                                   |          |                                                                                       |         |
| 7           |                                   |          |                                                                                       |         |
| 8           |                                   |          |                                                                                       |         |
| 9           | MatCon                            | major    | Link0: INSV, mateCon: OK (opt: BAD, wan: OK),<br>netCon: OK (local: OK, wanEdge: OK); |         |
| 10          |                                   |          | Link1: INSV, mateCon: OK (opt: BAD, wan: OK),<br>netCon: OK (local: OK, wanEdge: OK); |         |
| 11          |                                   |          | BLink: SYSB, mateCon: BAD;                                                            |         |
| 12          |                                   |          | FC: SYSB;                                                                             |         |
| 13 LogQuery |                                   |          |                                                                                       |         |
| 14 Alarm    |                                   |          |                                                                                       |         |
| 15 QueryIP  |                                   |          |                                                                                       |         |

Figure 2 shows an example of a NetCon alarm displayed on the CCA map, using the *alarm con* command.

**Figure 2 Example Map showing NetCon alarm**

|           |                                   |          |                                              |         |
|-----------|-----------------------------------|----------|----------------------------------------------|---------|
| CallAgent | SYS                               | CON      | APPL                                         | Unit: 0 |
| .         | .                                 | NetCon   | .                                            |         |
|           |                                   | M        |                                              |         |
| CAMtc     | CON alarms reported by CA unit 0: |          |                                              |         |
| 0 Quit    | Alarm                             | Severity | Description                                  |         |
| 2 Jam     | NetCon                            | major    | Link0: INSV, mateCon: OK (opt: OK, wan: OK), |         |
| 3 RelJam  |                                   |          | netCon: OK (local: OK, wanEdge: BAD);        |         |
| 4 REXtst  |                                   |          | Link1: INSV, mateCon: OK (opt: OK, wan: OK), |         |
| 5 SwAct   |                                   |          | netCon: OK (local: OK, wanEdge: OK);         |         |
| 6         |                                   |          | BLink: INSV, mateCon: OK;                    |         |
| 7         |                                   |          | FC: SYSB;                                    |         |
| 8         |                                   |          |                                              |         |

## 2.6 Related documentation

# 3: Configuration for A00008431

## 3.1 Hardware and Software Requirements

## 3.2 Initial Configuration

## 3.3 Office/Subnet parameters (OP/SP) (CM & SESM)

## 3.4 Upgrade Impact

None

## 3.5 Data schema (DS) (CM, MIBS, RDB)

No data schema changes.

## 3.6 Service Orders (SO) (CM & SESM)

No service order changes.

## 3.7 Software optionality control (SOC)

Not applicable.

## 3.8 Element Management

### 3.8.1 New/modified GUIs

| GUI name                        | NEW, CHANGED, or DELETED |
|---------------------------------|--------------------------|
| SAM21 EM 3PC provisioning Panel | Changed                  |

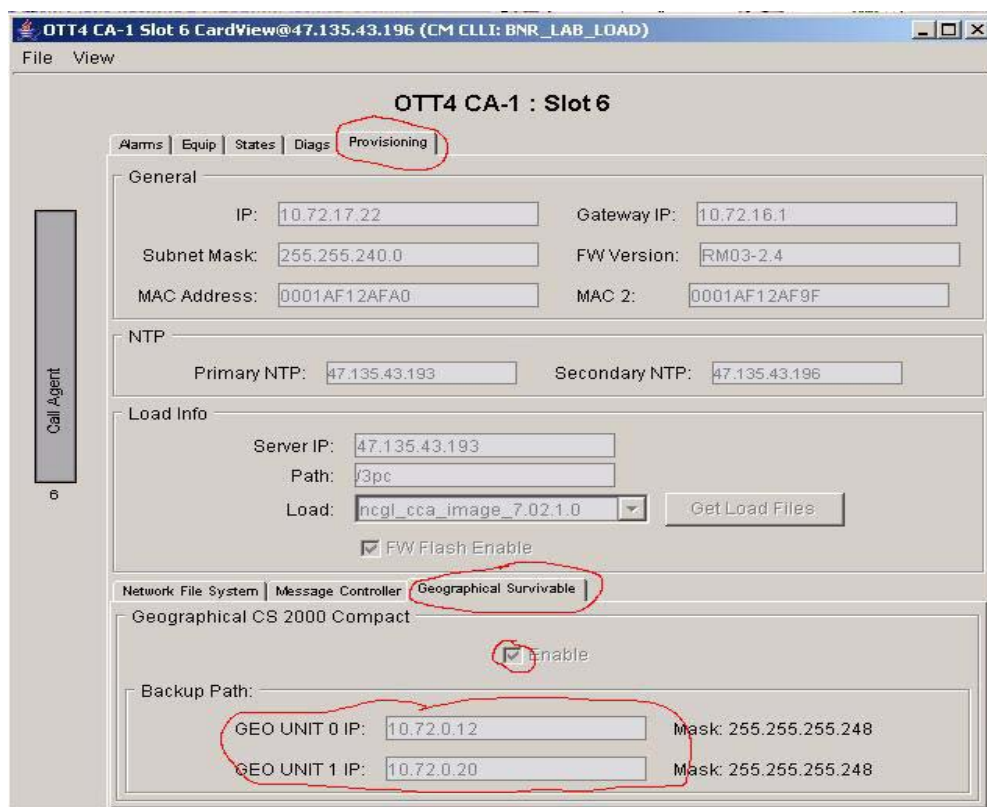
### 3.8.2 GUI information

#### 3.8.2.1 GUI name: SAM21 EM 3PC Provisioning Panel SAM21 EM 3PC Provisioning Panel

##### 3.8.2.1.1 Functional description

This panel is for provisioning 3PC card through SAM21 EM GUI. In this feature, a new sub panel for provisioning GR backup WAN IP addresses is added to the existing 3PC provisioning panel (refer to the following figure).

**Figure 1 SAM21Manager Call Agent Provisioning Panel**



##### 3.8.2.1.2 GUI usage and implications

Current datafill order unchanged.

##### 3.8.2.1.3 GUI size

**Table 1 New or modified GUIs**

| Abbreviated GUI name           | Minimum instances | Maximum instances | Information on memory             |
|--------------------------------|-------------------|-------------------|-----------------------------------|
| SAM21EM 3PC provisioning Panel | 0                 | 1 per card view   | Memory is automatically allocated |



### 3.8.2.1.4 GUI fields

The following table lists fields for the GR backup WAN IP addresses configuration panel which is newly added to existing SAM21 EM 3PC provisioning panel.

**Table 2 GUI field descriptions**

| Field         | New or Changed | Subfield | Entry | Explanation and action                                                                                                                                                                                | Associated MIB entry |
|---------------|----------------|----------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Enable        | New            | 0        | 0     | Check this box to enable Geographical Survivable WAN IP addresses configuration                                                                                                                       |                      |
| GEO UNIT 0 IP | New            | 0        | 0     | The IP address for the GEO UNIT 0 Backup path IP for CA 0.<br>The address specified here is the network ip +4.<br>The last octet of this IP address must be 4 less than a base multiple of 8 address. |                      |
| GEO UNIT 1 IP | New            | 0        | 0     | The IP address for the GEO UNIT 1 Backup path IP for CA 1.<br>The address specified here is the network ip +4.<br>The last octet of this IP address must be 4 less than a base multiple of 8 address. |                      |

### 3.8.2.1.5 Usage example

The following example shows sample datafill for GR backup WAN IP addresses configuration panel:

*Enable: true*

*GEO UNIT 0 IP: 47.142.114.84*

*GEO UNIT 1 IP: 47.142.114.44*

### 3.8.2.1.6 GUI release history update

N/A

### 3.8.2.1.7 Supplementary information

N/A

### 3.8.2.1.8 CLUI Interface

N/A

### 3.9 Command interface changes

N/A

### 3.10 Security

N/A

### 3.11 Configuration Walkthrough

During the CS 2000 - Compact Geographic Survivability Configuration mode, it is necessary to perform specific configuration for Geo Survivability at various phases of the commissioning and setup of the office.

#### 3.11.1 During Planning:

Ensure that the following additional configuration information is identified. Additional details are found in the System Engineering Bulletins.

- CA Backup Link VLANs and IP addresses. 2 separate 8 IP address ranges are required to setup packet routing via the IP network. These values are be configured in the GUI when configuring the CA cards. Both VLANs are configured with a subnet max of 255.255.255.248.

**Table 3 Example Backup Path IP addresses**

| IP                            | Comment                                             |
|-------------------------------|-----------------------------------------------------|
| 192.168.0.0 (base + offset 0) | Network ID - base address for vlan                  |
| 192.168.0.1 (base + offset 1) | Used by CA to access the local ERS 8600             |
| 192.168.0.2 (base + offset 2) | port 0 (localwan0 or matewan0)                      |
| 192.168.0.3 (base + offset 3) | port 1 (localwan1 or matewan1)                      |
| 192.168.0.4 (base + offset 4) | backup path provisioned value (localwan or matewan) |
| 192.168.0.5 (base + offset 5) | reserved                                            |
| 192.168.0.6 (base + offset 6) | reserved                                            |
| 192.168.0.7 (base + offset 7) | broadcast                                           |

- To enable the setgeoconfig script to automatically identify the CallP and OAM vlans, the following naming convention for CallP and OAMP VLANs is required. Additional details are found in the System Engineering Bulletins.

- The OAMP VLAN name must start with the string “OAMP”.
- All CallP VLAN names must start with the string “CallP”, except for the Private-CallP VLAN.

### 3.11.2 During CS-LAN configuration:

- Create 1 backup path vlan on each of the CS LAN routers. Additional details are found in the System Engineering Bulletins.
  - Create Backup\_path\_subnet VLAN by IPSubnet
  - Remove all ports from the backup\_path\_subnet except the two physical ports from the CA
  - Create a IP Traffic filter-set to allow traffic to/from the backup\_path\_subnet's only
  - Setup routing to ensure the backup path always routes through the core network, and not over the IST.
- If the CS LAN router is an ERS 8600, create a user acct and access policy for the CA access:
  - Enabling rlogin server
    - config bootconfig flags rlogind true
  - configuring and enabling an access policy.
    - # Create 3PC access policy on the ERS8600
    - config sys access-policy enable true
    - config sys access-policy policy 2 create
    - config sys access-policy policy 2 accesslevel rwa
    - config sys access-policy policy 2 host <CA IP address>
    - config sys access-policy policy 2 name "3PC-script"
    - config sys access-policy policy 2 username "root"
    - config sys access-policy policy 2 service rlogin enable

### 3.11.3 During CA GUI configuration:

In the CA GUI for each blade:

- Check the Enable check box in the Geographic Survivable section of the CA GUI.
- Enter the Unit0 and Unit1 Backup Link IPs as determined during planning.

**Figure 2 Backup Path provisioning**

OTT4 CA-1 : Slot 6

Alarms | Equip | States | Diags | **Provisioning**

General

IP: 10.72.17.22 Gateway IP: 10.72.16.1

Subnet Mask: 255.255.240.0 FW Version: RM03-2.4

MAC Address: 0001AF12AFA0 MAC 2: 0001AF12AF9F

NTP

Primary NTP: 47.135.43.193 Secondary NTP: 47.135.43.196

Load Info

Server IP: 47.135.43.193

Path: /3pc

Load: ncgl\_cca\_image\_7.02.1.0 Get Load Files

☒ FW Flash Enable

Network File System | Message Controller | **Geographical Survivable**

Geographical CS 2000 Compact

☒ Enable

Backup Path:

GEO UNIT 0 IP: 10.72.0.12 Mask: 255.255.255.248

GEO UNIT 1 IP: 10.72.0.20 Mask: 255.255.255.248

**3.11.4 During CA setup:**

Once the CA blades have been booted and brought inservice, use the setgeoconfig.sh script tool to configure the local router actions with the CA:

**3.11.4.1 Configuration with ERS 8600 router**

- As root user, invoke the setgeoconfig.sh script tool to begin the configuration:

**Figure 3 setgeoconfig.sh script invocation**

```
[root@10.73.17.19 root]# cd /usr/admin_bin/
[root@10.73.17.19 admin_bin]# ./setgeoconfig.sh
```

- Enter the ERS 8600 configuration mode, and enter the 8600 userid created for CA access.

**Figure 4 ERS 8600 configuration mode and userid**

```
*****
3PC-P8600 Passport Interaction configuration
*****
```

Note: Current value are put in [] at prompts  
Type new value or press enter for default

```
-----
Does this Geographic Redundant (RC)
Configuration of the CS2Kc use p8600
```

Type yes or no  
P8600\_used => [] : yes

```
-----
Type in Passport P8600 User ID
P8600_USER => [] : rwa
-----
```

- The script then validates connectivity to the ERS 8600, then connects to the ERS 8600 and retrieve a list of CallP and OAMP vlans. Confirm each vlan which will be configured to be part of the set to have OSPF disabled during certain failure scenarios. The script prompts for each vlan in turn.

**Figure 5 ERS 8600 configuration of CallP and OAMP vlans**

Configuring CallP & OAMP VLANs to monitor

```
-----
The following CallP & OAMP are configured on passport
```

|   |               |        |   |      |     |     |
|---|---------------|--------|---|------|-----|-----|
| 5 | CallP Private | byPort | 1 | none | N/A | N/A |
| 6 | CallP Carrier | byPort | 1 | none | N/A | N/A |
| 7 | CallP Public  | byPort | 1 | none | N/A | N/A |
| 8 | OAMP          | byPort | 1 | none | N/A | N/A |

```
-----
Do you want to include VLAN name:id [CallP:5]
Response => [y] :
```

Do you want to include VLAN name:id [CallP:6]  
Response => [y] :

Do you want to include VLAN name:id [CallP:7]  
Response => [y] :

Do you want to include VLAN name:id [OAMP:8]  
Response => [y] :

- The script summarizes the configuration data and exits. To correct any errors or change configuration data at another time, rerun the setgeoconfig.sh script.

**Figure 6 ERS 8600 configuration data summary**

```
-----
The config data for GEO scripts are as follows
Note : Run setgeoconfig.sh to modify any data
-----
```

```
P8600_used=yes
CMD=rsh
Passport_IP=10.73.0.9
P8600_USER=rwa

typeset -a WAN
WAN_Array_Size=1
WAN[0]=192.168.101.114
WAN_ALL='192.168.101.114'
typeset -a VLAN
VLAN[0]=5
VLAN[1]=6
VLAN[2]=7
VLAN[3]=8
VLAN_Array_Size=4
-----
```

```
[root@10.73.17.19 admin_bin]#
```

### 3.11.4.2 Configuration with non-ERS 8600 router

If the CS-LAN is not using ERS 8600 routers, this is also configured using the setgeoconfig.sh script tool.

- Invoke the setgeoconfig.sh script tool to begin the configuration:

**Figure 7 setgeoconfig.sh script invocation**

```
[root@10.73.17.19 root]# cd /usr/admin_bin/
[root@10.73.17.19 admin_bin]# ./setgeoconfig.sh
```

- Configure non-ERS 8600 mode.

**Figure 8 non-ERS 8600 configuration mode**

```
*****
3PC-P8600 Passport Interaction configuration
*****
```

Note : Current value are put in [] at prompts  
Type new value or press enter for default

```
-----
Does this Geographic Redundant (RC)
Configuration of the CS2Kc use p8600
```

```
Type yes or no
P8600_used => [yes] : no
-----
```

- Configure WAN edge IP to monitor. First configure the number of wan edge IPs to monitor (default 1), then the IPs to monitor. The script tests that the IPs are reachable by ping.

**Figure 9 non-ERS 8600 Wan edge configuration**

```
Configure WAN Edge IP
How many Wan Edge IP address required

WAN_Array_Size => [1] : 1

Read Wan edge IP address
WAN[0] => [192.168.101.114] : 192.168.101.114
-----
Pinging IP address 192.168.101.114
PING 192.168.101.114 (192.168.101.114) 56(84) bytes of data.
...
```

- The script summarizes the configuration data and exits. To correct any errors or change configuration data at another time, rerun the setgeoconfig.sh script.

**Figure 10 non-ERS 8600 configuration data summary**

```
The config data for GEO scripts are as follows
Note : Run setgeoconfig.sh to modify any data
-----
P8600_used=no
typeset -a WAN
WAN_Array_Size=1
WAN[0]=192.168.101.114
-----
[root@10.73.17.19 admin_bin]#
```

***Product = CS 2000 - GWC***

## **A00002512--GWC-EM Internet Transparency VCAC Provisioning**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAW, IAC

**Note:** This is an SN07 feature, included here by special request.

## 1.2 Description

The Internet Transparency (“ITrans”) solution, implemented in the SN06.x stream, provides a means for CS2K to enable IP-telephony across and between VPNs (Virtual Private Networks). This is achieved by taking into account the presence of NAT (Network Address Translator) middleboxes between MGs (Media Gateways) and the ‘outside world’, and inserting publicly-addressable MP (Media Proxy) devices into the media path where required.

The SN06 provisioning component of this work dealt with:

- datafilling of Media Proxy and (virtual) NAT devices
- association of MGs to an ‘adjacent’ NAT.
- association of MPs to GWCs (Gateway Controllers)
- downloading of MP/NAT information to GWCs as necessary.

See feature ACTIDs 89007809, 89007814 and 89007657 for further information on the SN06 provisioning functionality.

The present feature (SN07) builds on this provisioning functionality to add support for:

- datafilling of LBL (Limited Bandwidth Link) middleboxes in addition to NATs
- datafilling of RU (Resource Usage) data for use in the VCAC (Virtual Connections & Admissions Control) function of LBLs
- manual or automatic assignment of a GWC to carry out the RU capacity counting function on behalf of an LBL
- ‘chaining’ of middleboxes (NATs/LBLs) in a hierarchical network topology.
- downloading of MP/NAT/LBL/RU information to GWCs as necessary.

### VCAC Background

LBLs are a virtual representation of ‘policed’ capacity-restricted links in the network. An LBL carries a number (“max count”) representing maximum capacity through the link. Call set-up through the link causes a running total of used capacity to be incremented, and call take-down causes the running total to be decremented. If call set-up will cause the running total to exceed the LBL’s maximum capacity figure, the call attempt is rejected and routed to treatment (congestion tone).

The specific amount used to increment/decrement the running total is supplied by the Resource Usage entry used by the LBL. Each Resource Usage entry has



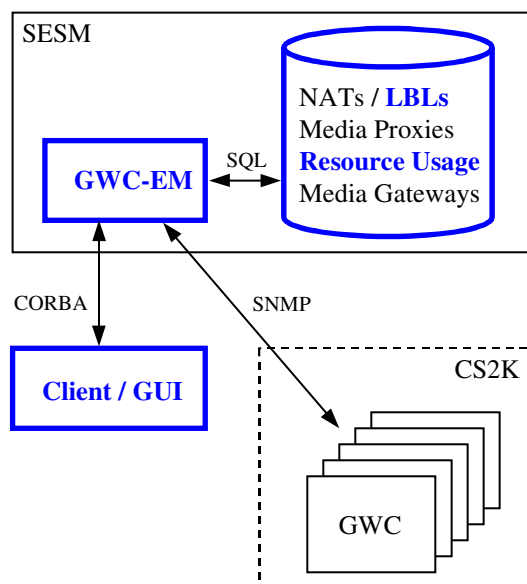
a set of ‘capacity-used-per-call’ values, depending on the codec and packetization rate in use on the call.

The running total is maintained by a counting device - in the SN07 release this device is a GWC. The counting device for a particular LBL is identified by entering the counter’s address into the LBL’s IP address field. There is one method for allocating the LBL’s counting device:

- “auto-generated” - the LBL’s address field is filled automatically when the LBL is first downloaded to a GWC.

### 1.3 Hardware Requirements or Dependencies

**Figure 1 System Configuration**



Note: The components outlined in blue will be affected by this provisioning activity.

#### **Requirements for the whole Pre-midcom solution:**

- CS2K.
- SESM Platform (Succession Element and Sub-Element Manager).
- IMS manager to handle provisioning of the Media Proxy.
- Uncontrolled NATs.
- Media Proxies.

- MGs.

## 1.4 Software Requirements or Dependencies

Dependencies:

- GWC should be running a software load of an equivalent stream to that of the SESM/GWC-EM, and should be running under a profile that enables ITrans functionality.

## 1.5 Limitations and restrictions

- There is only one NAT exit point from a local network.
- A Media Gateway has one or no adjacent middlebox. A NAT/LBL has one or no parent middlebox.
- The maximum length of sequentially 'chained' middleboxes (e.g. A --> B --> C, etc) is five.
- If two gateways are behind the same NAT then they can set up a call without requiring a Media Proxy.
- If two gateways are behind the same LBL, a call between them is not considered to use capacity on that LBL.
- The DQoS IAC solution (ACTID 59039082/59006771) uses "PepServer" middleboxes. The ITrans IAW solution uses NAT/LBL middleboxes. These two solutions are mutually exclusive as defined in the gateway profile service type (i.e. DQOS and ITRANS cannot be defined together in a profile).
- Where an LBL is 'shared' between two or more Succession Call Server networks (see ACTID.A00002644 "Common Topology Identifier Provisioning"), the LBL must be provisioned with exactly the same details on each network.

## 1.6 Interactions

The provisioning of LBL/RU data brings changes to the following GUIs:

- GWC-EM Network Panel (figures 2, 3, 4)
- Associate Media Gateway window (section 2.7.1.4).

The following features will also make changes in the Network Panel GUI:

- ACTID.A00002644 "Common Topology Identifier Provisioning"
- other [AT LEAST ONE OTHER... get details from Keith Raker]

This feature provisions data for use by the SN07 GWC CallP feature ACTID A00002739 "Virtual Connections Admissions Control".

## 1.7 Applicable customer facing sections

### Fault Management

|        |       |
|--------|-------|
| Logs   | _N/A_ |
| Alarms | _N/A_ |

### Configuration

|                    |       |
|--------------------|-------|
| Data Schema        | _N/A_ |
| User Interface     | _X_   |
| Element Management | _X_   |
| Security           | _N/A_ |
| Service Order      | _N/A_ |
| Office Parameters  | _N/A_ |

Accounting (includes AMA billing) \_N/A\_

Performance (includes operational measurements) \_N/A\_

### 1.7.1 User Interface - GUI

The upper section of the GWC-EM Network Panel GUI is reorganized to put the existing three subsections into tabbed panes. VCAC Resource Usage data is provisioned via the new RU table in a fourth tab in the upper section.

NATs are provisioned as before, except that:

- the tab is renamed “IP-VPNs (Virtual NATs)”
- a new field is added to provision a “Parent” (northbound neighbor) middlebox in the topology.

LBLs are provisioned via a table in a new tab added to the central section of the Network Panel.

Figures 2 and 3 and 4 show the Network Panel:

- before reorganization (SN06 version)
- after reorganization, NAT table visible
- after reorganization, new LBL table visible

The new RU data table can be seen in the upper part of the reorganized view.

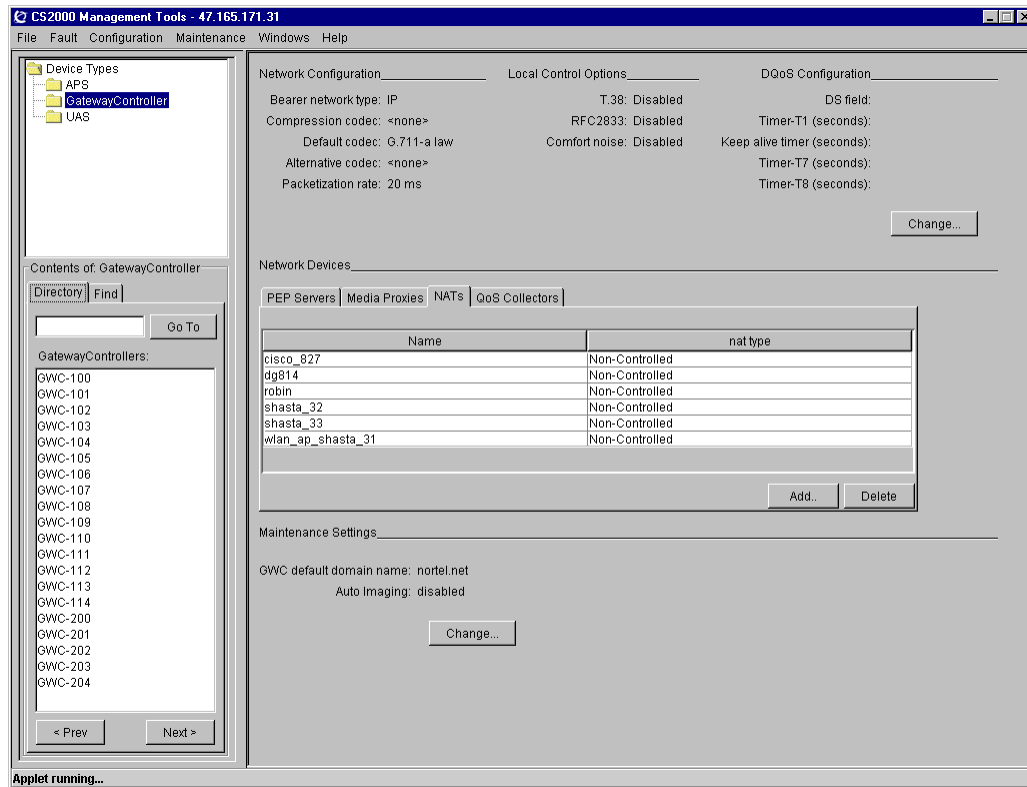
**Figure 2 Unmodified (SN06) view of GWC-EM Network Panel**

**Figure 3 Modified Network Panel (1)**

CS2000 Management Tools - 47.165.171.34 (CM CLI: CS2K1\_MAJD)

File Fault Configuration Maintenance Windows Help

Device Types

- APS
- GatewayController**
- UAS

Contents of GatewayController

Directory Find

Go To

GatewayControllers:

- GWC-102
- GWC-114

< Prev Next >

Last update: Sep 2, 2003 10:56 AM

Applet running...

Network Configuration

Network Fabric Local Control Options DQoS Configuration VCAC Resource Usage

| Description     | G.711/10 ms | G.711/20 ms | G.729/10 ms | G.729/20 ms |
|-----------------|-------------|-------------|-------------|-------------|
| voip-atm        | 128         | 106         | 85          | 43          |
| voip-ethernet   | 130         | 97          | 74          | 41          |
| never-blocked   | 0           | 0           | 0           | 0           |
| call-counting   | 1           | 1           | 1           | 1           |
| voip-frameRelay | 100         | 82          | 44          | 26          |

Add.. Delete Change..

Network Devices

PEP Servers Media Proxies IP-VPNs (Virtual NATs) Limited BW Links (VCAC) QoS Collectors

| Name                 | NAT Type       | Parent Middlebox         |
|----------------------|----------------|--------------------------|
| callCentresRus.co.ie | Non-Controlled | dublinPOP.uk.acmeISP.com |
| eastEndFoods.co.uk   | Non-Controlled | londonPOP.uk.acmeISP.com |
| liverpool.myBank.com | Non-Controlled | leedsPOP.uk.acmeISP.com  |
| london.myBank.com    | Non-Controlled | londonPOP.uk.acmeISP.com |

Add.. Delete Change..

Maintenance Settings

GWC default domain name: <not configured>

Auto Imaging: disabled

Change...

**Figure 4 Modified Network Panel (2)**

CS2000 Management Tools - 47.165.171.6 (CM CLI: CS2K1\_MAID)

File Fault Configuration Maintenance Windows Help

Device Types

- APS
- Gateway Controller
- UAS

Contents of Gateway Controller

Directory Find

Go To

Gateway Controllers:

GWC-105

< Prev Next >

Last update: 24-Mar-2004 14:42

Network Configuration

Network Codec Profile DQoS Configuration VCAC Resource Usage

| Name    | Bearer Network Type | Codec Selection | Packetization Rate | T-38     |
|---------|---------------------|-----------------|--------------------|----------|
| default | IP                  | G.711-a law     | 10 ms              | Disabled |

Add... Delete Change...

Network Devices

PEP Servers Media Proxies IP-VPNs (Virtual NATs) Limited BW Links (LBL) QoS Collectors Location Recipient

| Name | RU Name  | Max Count | Parent MiddleBox       |
|------|----------|-----------|------------------------|
| lbl1 | mfProf.1 | 2         | <none> (Top Level LBL) |
| lbl2 | mfProf.1 | 3         | <none> (Top Level LBL) |

Add... Delete Change...

General Network Settings

GWC default domain name: <not configured>

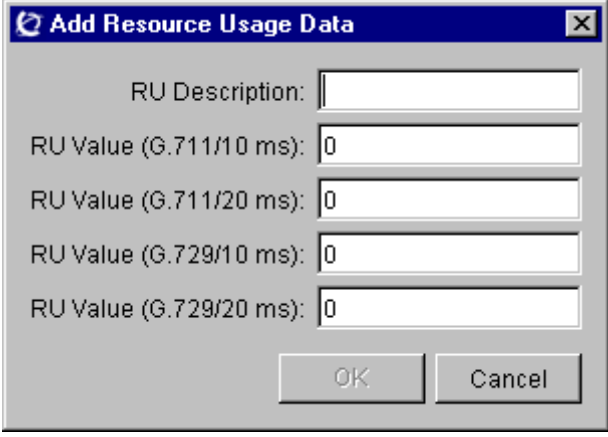
Call Agent id: 234

Auto Imaging: disabled Change...

**1.7.1.1 Provisioning Resource Usage data: Add, Change, Delete**

These operations are accessed by clicking the appropriate buttons on the tabbed pane of the VCAC Resource Usage table (figure 3).

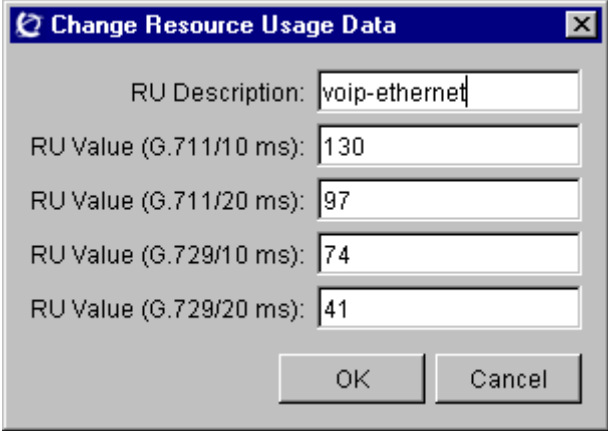
**Add Resource Usage data:** click the “Add” button in the Resource Usage tab to obtain the following box.



The dialog box titled "Add Resource Usage Data" contains five input fields and two buttons. The fields are labeled "RU Description:", "RU Value (G.711/10 ms):", "RU Value (G.711/20 ms):", "RU Value (G.729/10 ms):", and "RU Value (G.729/20 ms):". Each of the four "RU Value" fields contains the number "0". The "OK" and "Cancel" buttons are at the bottom right.

Enter a valid text description, and non-negative integer entries for each “RU Value” (zero is provided as a default). Click “OK” to confirm.

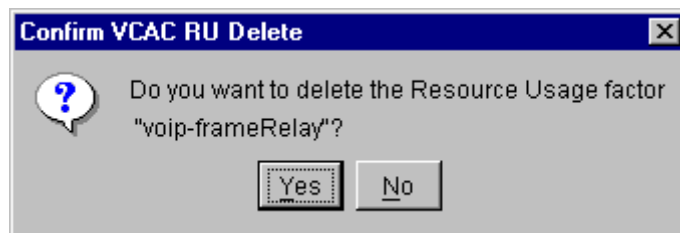
**Change Resource Usage data:** select an RU table entry and click the “Change” button to obtain the following box:



The dialog box titled "Change Resource Usage Data" contains five input fields and two buttons. The fields are labeled "RU Description:", "RU Value (G.711/10 ms):", "RU Value (G.711/20 ms):", "RU Value (G.729/10 ms):", and "RU Value (G.729/20 ms):". The "RU Description" field contains the text "voip-ethernet". The "RU Value" fields contain the numbers "130", "97", "74", and "41" respectively. The "OK" and "Cancel" buttons are at the bottom right.

Modify the required data fields and click “OK” to confirm.

**Delete Resource Usage data:** select an RU table entry and click the “Delete” button to obtain the following confirmation box:

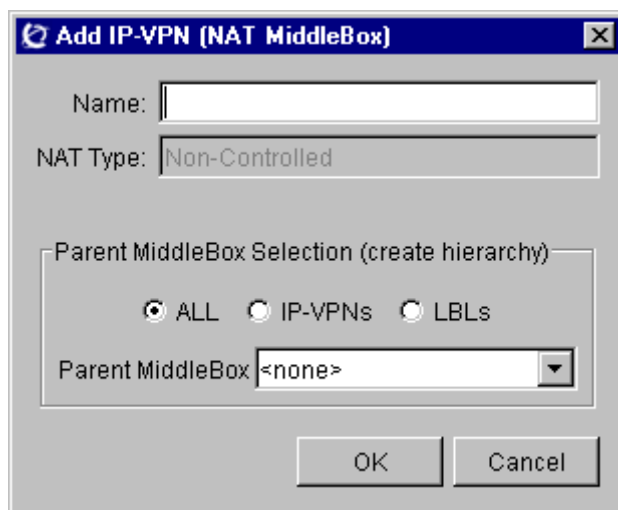


Click "Yes" to confirm. Note that the operation will be rejected if the RU Factor is currently 'in use', i.e. is currently referred to by an LBL.

#### 1.7.1.2 Provisioning NAT middleboxes: Add, Change, Delete

These operations are accessed by clicking the appropriate buttons on the tabbed pane of the IP/VPN table (figure 3).

**Add NAT middlebox:** click the "Add" button on the "IP-VPNs (Virtual NATs)" tab to obtain the following box:

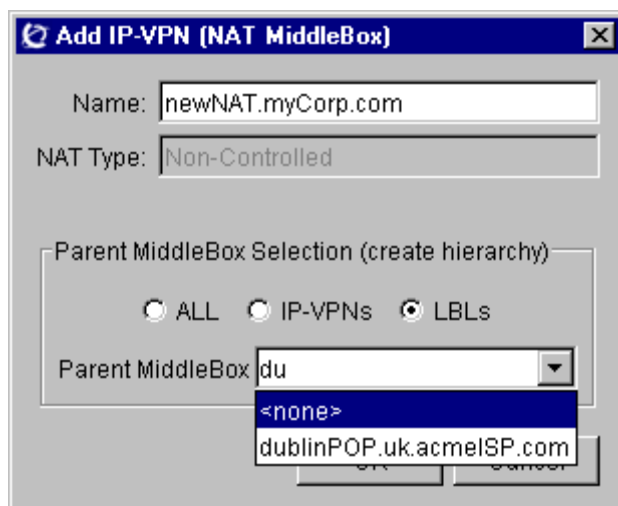


Enter a unique (DNS compliant, see ref 1) name. If appropriate use the filtered selection box to select a Parent Middlebox. Filtering is performed by one or both of:

- radio button selection to limit the choice to only NATs or only LBLs
- typing the starting letters of the Parent middlebox name to limit selection to those with matching starting letters.

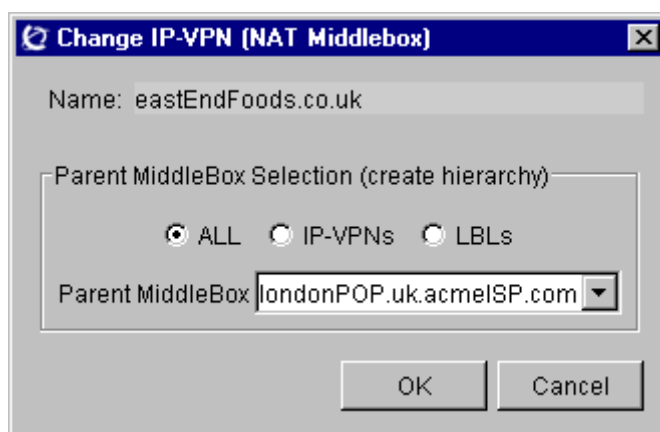


An example of filtered selection is shown below:



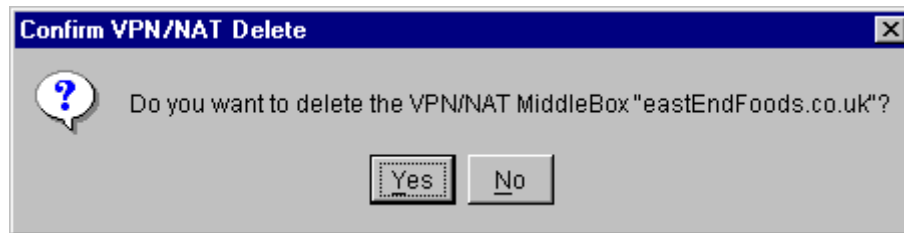
Selection of Parent middlebox is restricted to already provisioned middleboxes. Both NAT and LBL middleboxes can have either a NAT or an LBL as parent. Click “OK” to confirm.

**Change NAT middlebox:** select a NAT table entry and click the “Change” button to obtain the following box:



Modify the selected Parent middlebox as required (i.e. select another middlebox or <none>), and click “OK” to confirm.

**Delete NAT middlebox:** select a NAT table entry and click the “Delete” button to obtain the following confirmation box:



Click "Yes" to confirm. Note that the operation will be rejected if the NAT is currently 'in use', i.e. is currently referred to:

- as a parent by another middlebox
- as an adjacent middlebox by a Media Gateway.

### 1.7.1.3 Provisioning LBL middleboxes: Add, Change, Delete

These operations are accessed by clicking the appropriate buttons on the tabbed pane of the Low B/W Links table (figure 4).

**Add LBL middlebox:** click the "Add" button on the "Low B/W Links (VCAC)" tab to obtain the following box:

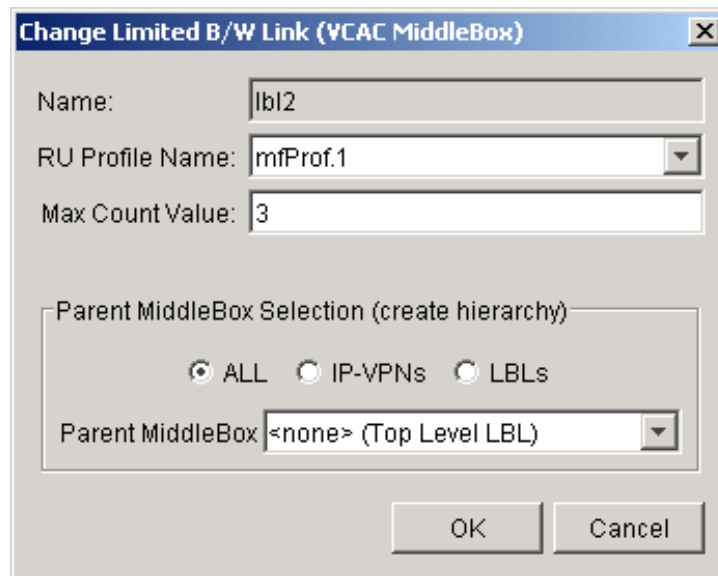
A Windows-style dialog box titled "Add Limited B/W Link (VCAC MiddleBox)". It contains several input fields: "Name:" (text box), "RU Profile Name:" (dropdown menu), "Max Count Value:" (text box), and "Parent MiddleBox Selection (create hierarchy)" which includes three radio buttons labeled "ALL", "IP-VPNs", and "LBLs" (with "ALL" selected), and a "Parent MiddleBox" dropdown menu showing "<none>". At the bottom are "OK" and "Cancel" buttons.

Enter the following information:

- valid text name (DNS compliant, see ref. 1)
- select RU Factor from the list provided
- enter a non-negative integer value for "Max Count Value"
- select Parent middlebox from the (filtered) list. Remember that an LBL can have either another LBL or a NAT as Parent middlebox.

Click “OK” to confirm.

**Change LBL middlebox:** select an LBL table entry and click the “Change” button to obtain the following box:

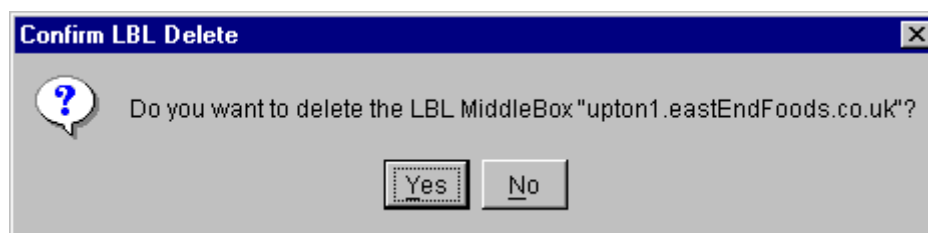


The dialog box titled "Change Limited B/W Link (VCAC MiddleBox)" contains the following fields and controls:

- Name:** A text field containing "lbl2".
- RU Profile Name:** A dropdown menu showing "mfProf.1".
- Max Count Value:** A text field containing "3".
- Parent MiddleBox Selection (create hierarchy):** A section containing three radio buttons: ☒ ALL, ☐ IP-VPNs, and ☐ LBLs.
- Parent MiddleBox:** A dropdown menu showing "<none> (Top Level LBL)".
- Buttons:** "OK" and "Cancel" buttons at the bottom right.

The name field is not modifiable, other fields may be edited as required. Parent middlebox may be changed to either another middlebox or <none>. Click “OK” to confirm. NB: the RU Factor and the Parent may not be changed in the same operation - they must be modified in separate change operations.

**Delete LBL middlebox:** select an LBL table entry and click the “Change” button to obtain the following confirmation box:



The dialog box titled "Confirm LBL Delete" contains the following elements:

- Question:** "Do you want to delete the LBL MiddleBox 'upton1.eastEndFoods.co.uk'?"
- Buttons:** "Yes" and "No" buttons.

Click “Yes” to confirm. Note that the operation will be rejected if the LBL is currently ‘in use’, i.e. is currently referred to:

- as a parent by another middlebox
- as an adjacent middlebox by a Media Gateway.

#### 1.7.1.4 Associate/Change Middlebox to a Media Gateway

This is unchanged from SN06 functionality except that filtered selection is used to choose an Adjacent Middlebox, as shown below for the Associate operation:

**Associate Media Gateway**

Gateway name: aslwg4.1.upton1

Gateway IP address:

Gateway controller name: GWC-102

Gateway profile name: ASKEY\_LINE\_GW\_4

Reserved terminations: 4

Gateway site name: LG

Internet Transparency

☐ MG outside CS2K VPN, not behind NAT

IP/VPN Site Selection

☐ VPNs/NATs ☒ LBLs

MiddleBox up  
<none>

Signal Proto upton1.eastEndFoods.co.uk

Protocol type:

Protocol port:

Protocol version:

OK Cancel

Note: attempting to remove an adjacent middlebox from a Media Gateway will be rejected if the middlebox or any member of it's 'northbound' topology chain is a NAT.

#### 1.7.2 XML Interfaces

Modified Interfaces in Sn07

- Add/Query NATs - added parent middlebox attribute

New Interfaces introduced in Sn07 are as follows:

- Change NATs

- Add/Delete and Change Media Proxies.
- Add/Delete/Query and Change Resource Usage profiles
- Add/Delete/Query and Change LBL entries.

#### 1.7.2.1 Add NAT XML command

Add NAT is modified SN07 the <parentMB> tag has been added. The value of this tag must have been previously provisioned into the system to successfully complete this command.

The XML for this command is shown in Figure 5, Figure 6. Error messages returned are described in Appendix B.

**Figure 5 XML command to Add NAT device.**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <addNAT usn="1" version="1.0">
        <Parameters>
          <NATname>NAT-A</NATname>
          <ParentMB>VPN-Eastenders</ParentMB>
        </Parameters>
      </addNAT>
    </Methods>
  </Command>
</CommandList>
```

**Figure 6 XML response to Add NAT**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITranslf</Interface>
    <Methods>
      <addNAT usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </addNAT>
    </Methods>
  </Response>
</CommandList>
```

### 1.7.2.2 Query NAT XML command

The Query NAT response is modified SN07 the <parentMB> tag has been added

The XML for this command is shown in Figure 7, Figure 8. Error messages returned are described in Appendix B.

**Figure 7 XML command to Query a NAT**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <Parameters>
          <NATname>NAT-A</NATname>
        </Parameters>
      </queryNAT>
    </Methods>
  </Command>
</CommandList>
```

**Figure 8 XML response to Query NAT**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITranslf</Interface>
    <Methods>
      <queryNAT usn="1" version="1.0">
        <ReturnData>
          <NATname>NAT-A</NATname>
          <ParentMB>VPN-Eastenders</ParentMB>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryNAT>
    </Methods>
  </Response>
</CommandList>
```

### 1.7.2.3 Change NAT XML command

Change NAT is new to SN07 because there was no data in the SN06 releases to change, in Sn07 the only attribute that can change is the <ParentMB>

tag. The value of this tag must have been previously provisioned into the system to successfully complete this command.

The XML for this command is shown in Figure 9, Figure 10. Error messages returned are described in Appendix B.

**Figure 9 XML command to Change specified NAT parent middlebox**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeNAT usn="1" version="1.0">
        <Parameters>
          <NATName>NAT-A</NATName>
          <ParentMB>VPN-Eastenders</ParentMB>
        </Parameters>
      </changeNAT>
    </Methods>
  </Command>
</CommandList>
```

**Figure 10 XML response to Change specified NAT**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeNAT usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </changeNAT>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.4 Add Media Proxy XML command

Media Proxy provisioning via XML is new to SN07.

The XML for this command is shown in Figure 11, Figure 12. Error messages returned are described in Appendix B.

**Figure 11 XML command to Create a new Media Proxy**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <addMP usn="1" version="1.0">
        <Parameters>
          <MPname>MP-A</MPname>
          <IPAddress>47.165.32.23</IPAddress>
          <Protocol>MGCP+</Protocol>
          <ProtocolVersion>2.0</ProtocolVersion>
        </Parameters>
      </addMP>
    </Methods>
  </Command>
</CommandList>
```

**Figure 12 XML response to Creating a new Media Proxy command**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <addMP usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </addMP>
    </Methods>
  </Response>
</CommandList>
```

### 1.7.2.5 Change Media Proxy XML command

Media Proxy provisioning via XML is new to SN07.

The XML for this command is shown in Figure 13, Figure 14. Error messages returned are described in Appendix B.



**Figure 13 XML command to Change IP data of a Media Proxy**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeMP usn="1" version="1.0">
        <Parameters>
          <MPname>MP-A</MPname>
          <IPAddress>47.165.32.22</IPAddress>
          <Protocol>MGCP+</Protocol>
          <ProtocolVersion>2.0</ProtocolVersion>
        </Parameters>
      </changeMP>
    </Methods>
  </Command>
</CommandList>
```

**Figure 14 XML response to Change Media Proxy IP data.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeMP usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </changeMP>
    </Methods>
  </Response>
</CommandList>
```

### 1.7.2.6 Delete Media Proxy XML command

Media Proxy provisioning via XML is new to SN07.

The XML for this command is shown in Figure 15, Figure 16. Error messages returned are described in Appendix B.

**Figure 15 XML command to Delete a Media Proxy**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <deleteMP usn="1" version="1.0">
        <Parameters>
          <MPname>MP-A</MPname>
        </Parameters>
      </deleteMP>
    </Methods>
  </Command>
</CommandList>
```

**Figure 16 XML response to Deleting Media Proxy.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <deleteMP usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </deleteMP>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.7 Creating RU profile command

Resource Usage provisioning is new to SN07. To successfully create an RU profile the XML client must provide every Codec/packetRate combination that has been entered into the CS2K config manager.

The XML for this command is shown in Figure 17, Figure 18. Error messages returned are described in Appendix B.

**Figure 17 XML command to Create an RU profile**

```

<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <addRU usn="1" version="1.0">
        <Parameters>
          <RUDescription>AAL1/IP40</RUDescription>
          <RUValue>
            <Codec>G.711</Codec>
            <PacketRate>10 ms</PacketRate>
            <Value>103</Value>
          </RUValue>
          <RUValue>
            <Codec>G.711</Codec>
            <PacketRate>20 ms</PacketRate>
            <Value>133</Value>
          </RUValue>
          <RUValue>
            <Codec>G.729</Codec>
            <PacketRate>10 ms</PacketRate>
            <Value>132</Value>
          </RUValue>
          <RUValue>
            <Codec>G.729</Codec>
            <PacketRate>20 ms</PacketRate>
            <Value>103</Value>
          </RUValue>
        </Parameters>
      </addRU>
    </Methods>
  </Command>
</CommandList>

```

**Figure 18 XML response to Creating an RU profile.**

```

<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITranslf</Interface>
    <Methods>
      <addRU usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </addRU>
    </Methods>
  </Response>
</CommandList>

```

### 1.7.2.8 Changing RU profile command

Resource Usage provisioning is new to SN07. To successfully change an RU profile the XML client must either provide and <RUNewDescription> OR every Codec/packetRate combination that has been entered into the CS2K config manager.

The XML for this command is shown in Figure 19, Figure 20, Figure 21. Error messages returned are described in Appendix B.

**Figure 19 XML to Change an RU profile Description.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeRU usn="1" version="1.0">
        <Parameters>
          <RUDescription>AAL1/IP40</RUDescription>
          <RUNewDescription>AAL1/IP71 </RUNewDescription>
        </Parameters>
      </changeRU>
    </Methods>
  </Response>
</CommandList>
```

**Figure 20 XML command Change RU profile data**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <changeRU usn="1" version="1.0">
        <Parameters>
          <RUDescription>AAL1/IP40</RUDescription>
          <RUValue>
            <Codec>G.711</Codec>
            <PacketRate>10 ms</PacketRate>
            <Value>123</Value>
          </RUValue>
          <RUValue>
            <Codec>G.711</Codec>
            <PacketRate>20 ms</PacketRate>
            <Value>133</Value>
          </RUValue>
          <RUValue>
            <Codec>G.729</Codec>
            <PacketRate>10 ms</PacketRate>
            <Value>152</Value>
          </RUValue>
          <RUValue>
            <Codec>G.729</Codec>
            <PacketRate>20 ms</PacketRate>
            <Value>163</Value>
          </RUValue>
        </Parameters>
      </changeRU>
    </Methods>
  </Command>
</CommandList>
```

**Figure 21 XML response to Changing an RU profile.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeRU usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </changeRU>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.9 Query RU profile XML command

Resource Usage provisioning is new to SN07. The XML client has the option to either Query all the RU profiles, or the RU data for a particular profile.

The XML for this command is shown in Figure 22, Figure 23, Figure 24, Figure 25. Error messages returned are described in Appendix B.

**Figure 22 XML command to Query all RU Profiles**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryRU usn="1" version="1.0">
        <Parameters>
        </Parameters>
      </queryRU>
    </Methods>
  </Command>
</CommandList>
```

**Figure 23 XML response to query all RU profiles.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryRU usn="1" version="1.0">
        <ReturnData>
          <RUDescription>AAL1/IP40</RUDescription>
          <RUDescription>AAL2/IP40</RUDescription>
          <RUDescription>AAL1/IP40-B</RUDescription>
          <RUDescription>AAL2/IP40-B</RUDescription>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryRU>
    </Methods>
  </Response>
</CommandList>
```

**Figure 24 XML command to Query an RU Profile data**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryRU usn="1" version="1.0">
        <Parameters>
          <RUDescription>AAL1/IP40</RUDescription>
        </Parameters>
      </queryRU>
    </Methods>
  </Command>
</CommandList>
```

**Figure 25 XML response to Querying an RU profile.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryRU usn="1" version="1.0">
        <ReturnData>
          <RUDescription>AAL1/IP40</RUDescription>
          <RUValue>
            <Codec>G.711</Codec>
            <PacketRate>10 ms</PacketRate>
            <Value>123</Value>
          </RUValue>
          <RUValue>
            <Codec>G.711</Codec>
            <PacketRate>20 ms</PacketRate>
            <Value>133</Value>
          </RUValue>
          <RUValue>
            <Codec>G.729</Codec>
            <PacketRate>10 ms</PacketRate>
            <Value>152</Value>
          </RUValue>
          <RUValue>
            <Codec>G.729</Codec>
            <PacketRate>20 ms</PacketRate>
            <Value>163</Value>
          </RUValue>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryRU>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.10 Delete RU profile XML command

Resource Usage provisioning is new to SN07.

The XML for this command is shown in Figure 26, Figure 27. Error messages returned are described in Appendix B.



**Figure 26 XML command to Delete an RU Profile**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <deleteRU usn="1" version="1.0">
        <Parameters>
          <RUDescription>AAL1/IP40</RUDescription>
        </Parameters>
      </deleteRU>
    </Methods>
  </Command>
</CommandList>
```

**Figure 27 XML response to Deleting an RU profile.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <deleteRU usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </deleteRU>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.11 Add LBL XML command

Limited Bandwidth Links provisioning is new to SN07. The <CounterGWC> tag is optional, if omitted the counterGWC is automatically assigned. The <RUDescription> and <ParentMB> values must have been previously provisioned into the system to successfully complete this operation.

The XML for this command is shown in Figure 28, Figure 29. Error messages returned are described in Appendix B.

**Figure 28 XML command to Create a LBL device**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <addLBL usn="1" version="1.0">
        <Parameters>
          <LBLname>LBL1</LBLname>
          <CounterGWC>47.132.132.12</CounterGWC>
          <RUDescription>AAL1/ip40</RUDescription>
          <MaxCount>1000</MaxCount>
          <ParentMB>VPN-A</ParentMB>
        </Parameters>
      </addLBL>
    </Methods>
  </Command>
</CommandList>
```

**Figure 29 XML response to Creating a LBL device.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITranslf</Interface>
    <Methods>
      <addLBL usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </addLBL>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.12 Change LBL XML command

Limited Bandwidth Links provisioning is new to SN07. The <LBLname> tag is required the other changing data tags are optional. The <RUDescription> and <ParentMB> values must have been previously provisioned into the system to successfully complete this operation.

The XML for this command is shown in Figure 30, Figure 31. Error messages returned are described in Appendix B.

**Figure 30 XML command to Change a LBL device RU profile.**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeLBL usn="1" version="1.0">
        <Parameters>
          <LBLname>LBL1</LBLname>
          <RUDescription>AAL2/ip40</RUDescription>
        </Parameters>
      </changeLBL>
    </Methods>
  </Command>
</CommandList>
```

**Figure 31 XML response to Changing a LBL device.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeLBL usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </changeLBL>
    </Methods>
  </Response>
</CommandList>
```

### 1.7.2.13 Query LBL XML command

The Query LBL is new to SN07

The XML for this command is shown in Figure 32, Figure 33. Error messages returned are described in Appendix B.

**Figure 32 XML command to Query a LBL**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryLBL usn="1" version="1.0">
        <Parameters>
          <LBLname>LBL-A</LBLname>
        </Parameters>
      </queryLBL>
    </Methods>
  </Command>
</CommandList>
```

**Figure 33 XML response to Query LBL**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryLBL usn="1" version="1.0">
        <ReturnData>
          <LBLname>LBL1</LBLname>
          <CounterGWC>47.132.132.12</CounterGWC>
          <RUDescription>AAL1/ip40</RUDescription>
          <MaxCount>1000</MaxCount>
          <ParentMB>VPN-A</ParentMB>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryLBL>
    </Methods>
  </Response>
</CommandList>
```

#### 1.7.2.14 Delete LBL XML command

Limited Bandwidth Links provisioning is new to SN07.

The XML for this command is shown in Figure 34, Figure 35. Error messages returned are described in Appendix B.

**Figure 34 XML command to Delete a LBL device**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <deleteLBL usn="1" version="1.0">
        <Parameters>
          <LBLname>LBL1</LBLname>
        </Parameters>
      </deleteLBL>
    </Methods>
  </Command>
</CommandList>
```

**Figure 35 XML response to Deleting a LBL device.**

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <deleteLBL usn="1" version="1.0">
        <ReturnData>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </deleteLBL>
    </Methods>
  </Response>
</CommandList>
```

## 1.8 Authorization for Commands

The security for the GUI Client and OSSgate interface includes support for permission or 'Authorization' levels for commands. Each command is associated with one or more user groups. In order to execute a command, a user must belong to at least one of the associated user groups. The user groups associated with the new /modified commands associated with this feature are specified in the table below.

**Table 4 Internet Transparency Commands Authorization**

| Command   | User Group |       |        |          |       |
|-----------|------------|-------|--------|----------|-------|
|           | mgcadm     | mgcrw | mgcmic | mgcsprov | mgcro |
| addNat    | X          | X     |        |          |       |
| changeNAT | X          | X     |        |          |       |
| queryNAT  | X          | X     | X      | X        | X     |
| addMP     | X          | X     |        |          |       |
| changeMP  | X          | X     |        |          |       |
| deleteMP  | X          | X     |        |          |       |
| addRU     | X          | X     |        |          |       |
| changeRU  | X          | X     |        |          |       |
| queryRU   | X          | X     | X      | X        | X     |
| deleteRU  | X          | X     |        |          |       |
| addLBL    | X          | X     |        |          |       |
| changeLBL | X          | X     |        |          |       |
| queryLBL  | X          | X     | X      | X        | X     |
| deleteLBL | X          | X     |        |          |       |
|           |            |       |        |          |       |
|           |            |       |        |          |       |

## 1.9 References

1. DNS naming conventions: see for example IETF RFC 1034, or <http://www.dns.net>

## 1.10 Glossary

| Term   | Description                                |
|--------|--------------------------------------------|
| CORBA  | Common Object Request Broker Architecture  |
| DNS    | Domain Naming System                       |
| GUI    | Graphical User Interface                   |
| GWC    | Gateway Controller                         |
| GWC-EM | GWC Element Manager                        |
| IAC    | Cable solution                             |
| IAW    | Wireline                                   |
| IP     | Internet Protocol                          |
| ITrans | Internet Transparency solution             |
| LBL    | Low Bandwidth Link                         |
| MG     | Media Gateway                              |
| MP     | Media Proxy                                |
| NAT    | Network Address Translation                |
| RU     | VCAC Resource Usage                        |
| SESM   | Succession Element and Sub-Element Manager |
| SNMP   | Simple Network Management Protocol         |
| VCAC   | Virtual Connection Admission Control       |
| VPN    | Virtual Private Network                    |

## 1.11 Appendix A: ITrans/VCAC Provisioning Steps

This section provides a high-level overview of the provisioning steps required to set up the ITrans VCAC functionality NEW installation SN07.

- 1 Network Analysis/Modelling: identify the key locations in the network for NAT and LBL **functions** (not physical devices). Model and provision the Resource Usage values required for the VCAC functionality.
- 2 On the CS2K Config Manager provision model as defined by step 1. Starting with individual NAT/LBL middleboxes: these are provisioned in top-down hierarchical order, i.e. starting with those closest to the network

core. Remember that a 'parent' middlebox must be already provisioned before a 'child' that refers to it can be provisioned.

- 3 On the CS2K Config Manager provision MGs: select the appropriate ITrans middlebox (NAT or LBL) from the topological model as the 'adjacent middlebox' for the MG.

Existing ITrans network models (SN06.x stream, NATs and MGs) may be adapted to the SN07 form by:

- 1 following steps 1 and 2 above for new middleboxes.
- 2 changing the parent middlebox fields of existing (NAT) middleboxes as required to insert them at the correct location in the topology.
- 3 changing the adjacent middlebox field of existing MGs as required to associate them to the appropriate middlebox (NAT or LBL) in the topology.

## 1.12 Appendix B: XML validation schemas

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

    <!--
    *****
    *** -->
    <!-- * Define addNAT Method Parameters -->
    <!--
    *****
    *** -->

    <xsd:complexType name="addNATmethodType">
        <xsd:all>
            <xsd:element name="Parameters" type="addNATparamsType" />
        </xsd:all>
        <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
    </xsd:complexType>

    <xsd:complexType name="addNATparamsType">
        <xsd:sequence>
            <xsd:element name="NATname" type="NoSpaceNameType" />
            <xsd:element name="ParentMB" type="NoSpaceNameType" />
        <xsd:sequence>
        </xsd:complexType>
    </xsd:schema>

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >
```



```

<!--
*****
*** -->

<!-- * Define changeNAT Method Parameters -->
<!--
*****
*** -->

<xsd:complexType name="changeNATmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="changeNATparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="changeNATparamsType">
  <xsd:sequence>
    <xsd:element name="NATname" type="NoSpaceNameType" />
    <xsd:element name="ParentMB" type="NoSpaceNameType" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

<!--
*****
*** -->

<!-- * Define addMP Method Parameters -->
<!--
*****
*** -->

<xsd:complexType name="addMPmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="addMPparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="addMPparamsType">
  <xsd:sequence>
    <xsd:element name="MPname" type="NoSpaceNameType" />
    <xsd:element name="IPAddress" type="IPAddressType" />
    <xsd:element name="Protocol" type="NoSpaceNameType" />
    <xsd:element name="ProtocolVersion" type="NoSpaceNameType" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

<!--
*****
*** -->

```

```

<!-- * Define changeMP Method Parameters -->
<!--
*****
*** -->
<xsd:complexType name="changeMPmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="changeMPparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="changeMPparamsType">
  <xsd:sequence>
    <xsd:element name="MPname" type="NoSpaceNameType" />
    <xsd:element name="IPAddress" type="IPAddressType" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

<!--
*****
*** -->

<!-- * Define deleteMP Method Parameters -->
<!--
*****
*** -->
<xsd:complexType name="deleteMPmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="deleteMPparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="deleteMPparamsType">
  <xsd:sequence>
    <xsd:element name="MPname" type="NoSpaceNameType" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

<!--
*****
*** -->

<!-- * Define addRU Method Parameters -->
<!--
*****
*** -->
<xsd:complexType name="addRUmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="addRUparamsType" />

```

```

    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="addRUparamsType">
  <xsd:sequence>
    <xsd:element name="RUDescription" type="xsd:string" />
    <xsd:element name="RUValue" type="CodecPacketValue" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CodecPacketValue">
  <xsd:sequence>
    <xsd:element name="Codec" type="CodecType" />
    <xsd:element name="PacketRate" type="PacketType" />
    <xsd:element name="Value" type="NoSpaceNumberType" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

  <!--
  **** -->
  <!-- * Define changeRU Method Parameters -->
  <!--
  **** -->

  <xsd:complexType name="changeRUmethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="changeRUparamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="changeRUparamsType">
    <xsd:sequence>
      <xsd:element name="RUDescription" type="xsd:string" />
      <xsd:choice minOccurs="0">
        <xsd:element name="RUNewDescription" type="xsd:string" />
        <xsd:element name="RUValue" type="ChangeCodecPacketValue" maxOccurs="unbounded" />
      </xsd:choice>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ChangeCodecPacketValue">
    <xsd:sequence>
      <xsd:element name="Codec" type="CodecType" />
      <xsd:element name="PacketRate" type="PacketType" />
      <xsd:element name="Value" type="NoSpaceNumberType" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"

```

```

        version="1.0"
        xml:lang="en" >

<!--
*****
*** -->

<!-- * Define queryRU Method Parameters -->
<!--
*****
*** -->

<xsd:complexType name="queryRUMethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="queryRUparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="queryRUparamsType">
  <xsd:choice minOccurs="0">
    <xsd:element name="RUDescription" type="xsd:string" />
  </xsd:choice>
</xsd:complexType>
</xsd:schema>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

<!--
*****
*** -->

<!-- * Define deleteRU Method Parameters -->
<!--
*****
*** -->

<xsd:complexType name="deleteRUMethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="deleteRUparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="deleteRUparamsType">
  <xsd:sequence>
    <xsd:element name="RUDescription" type="xsd:string" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>

```

## 1.13 Appendix C: Error codes and messages

**Table 5 Return codes when command is unsuccessful**

| Cause of error                                                                                                 | Return code | Example return messages                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Incorrect command version in query                                                                             | 301         | Unsupported version                                                                                                                                                                                                                  |
| Platform applications internal error: OSS Interface applications cannot connect to required server application | 302         | Interfacing error                                                                                                                                                                                                                    |
| Unable to provision requested Itrans data because of a database error occurred                                 | 303         | Database error occurred during setting of RU data                                                                                                                                                                                    |
| Unable to provision requested Itrans data because of invalid input data                                        | 304         | Cannot set LBL Max count, value must be between 1 and <Max int><br><br>Cannot set LBL ParentMB, value not configured.<br><br>Cannot set LBL RUDescription, value not configured.<br><br>Cannot provision RU profile, RUvalue missing |
| No Itrans data for this query. e.g. no NAT meets selection criteria or the NAT/GWC specified does not exist    | 305         | NAT not found<br><br>No NAT found for GWC                                                                                                                                                                                            |
| User is not a member of any of the user groups allowed to perform this action                                  | 501         | Insufficient permissions to perform this operation                                                                                                                                                                                   |

### 1.13.1 Example Error Message

```

<?xml version='1.0'?>
  <CommandList>
    <Response>
      <Interface>ITransIf</Interface>
      <Methods>
        <queryNAT usn="1.0" version="1.0">
          <ReturnData>
            <NATName>nat1111</NATName>
            <ReturnCode value= "305" text="NAT not found"/>
          </ReturnData>
        </queryNAT usn="1.0">

```

```
</Methods>
</Response>
</CommandList>
```

## 1.14 Appendix D: XML Commands: description of method parameters

### 1.14.1 Parameter definitions (new in SN07)

- **ParentMB** - The name of the parent Middlebox for this device. This allows ITrans devices to be connected into a hierarchy. A value of <none> indicates that this device has no parent. TYPE *NoSpaceNameType*. (32 character token without spaces, see xsd definitions in Appendix A).
- **MPname** - The unique name of the Media Proxy. This must be in a valid DNS format. TYPE *NoSpaceNameType*.
- **IPAddress** - The Media Proxy IP address. TYPE *IPAddressType*.
- **Protocol** - The Media Proxy communication protocol (GWC to MP). This must be either MGCP+ or MPCP. TYPE *NoSpaceNameType*.
- **ProtocolVersion** - The Media Proxy communication protocol version. This must be 1.0 or 2.0. TYPE *NoSpaceNameType*.
- **RUDescription** - The Resource Usage profile name. TYPE *NoSpaceNameType*.
- **RUValue** - a composite of the following parameters. Codec, PacketRate, Value  
TYPE *CodecPacketValue*
- **Codec** - A valid codec that has been entered in the CS2K config manager. E.G. G.711 or G.729. TYPE *CodecType*
- **PacketRate** - A valid Packet is at ion rate. E.G. 10 ms, 20 ms. TYPE *PacketType*
- **Value** - A resource usage value that one call will use. This is the basic call count value that VCAC uses to measure calls through a Limited Bandwidth Link.  
TYPE *NoSpaceNumberType*
- **RUNewDescription** - The new name of an RU profile.  
TYPE *NoSpaceNameType*
- **LBLName** - The unique name of the Limited Bandwidth Link device. This must be in a valid DNS format. TYPE *NoSpaceNameType*.
- **CounterGWC** - The VCAC counter GWC IP address. TYPE *IPAddressType*
- **MaxCount** - The VCAC count maximum limit.

### 1.14.2 Method Parameters

Method parameters are defined below. Input data is mandatory except where indicated otherwise.

1. **addNAT** - Method to create a new NAT (virtual NAT function). This method has the following parameters:
  - Input data:
    - usn
    - version
    - NATname. The unique name of the NAT device
    - ParentMB (Optional). The name of the parent Middlebox for this device. This allows ITrans devices to be connected into a hierarchy. A value of <none> indicates that this device has no parent. (default = <none>)
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - CallAgentId - The value of the Call Agent Id for this Call Agent (CS2k).
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
2. **queryNAT** - Method to list the NATs. Optional parameters allow the client to choose the data returned. This method has the following parameters:
  - Input data:
    - usn
    - version
    - NATname (Optional, cannot be included as well as GWCname)- A Unique Name of a NAT device, to get full info on a device
    - GWCname (Optional, cannot be included as well as NATname) - To obtain a list of all NATs on a GWC (Use GWC-XX format)
    - ListNATid (Optional) - Set to true if the NAT ids are required.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - GWCname (only when the GWCname option requested)
    - NATname
    - ParentMB (only when the full details are requested)
    - NATType (returned only when the full details are requested)
    - NATid (returned only when ListNATid is set to 'true' in the input data)

- ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
3. **changeNAT** - Method that changes a provisioned NAT information into the CS2k Mgr. This method has the following parameters:
- Input data:
    - usn
    - version
    - NATname - unique name for the NAT to be changed
    - ParentMB - The new parent middlebox name. Enter <none> to remove the topology for this NAT device. Note: the parent Middlebox name entered must have been already provisioned into the CS2k Mgr.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
4. **addMP** - Method that creates a Media Proxy device into the CS2k Mgr. This method has the following parameters:
- Input data:
    - usn
    - version
    - MPname - unique name for the MP to be provisioned
    - IPAddress - The IP address of the MP device
    - Protocol - Enter “MGCP+” for the control protocol of the device
    - ProtocolVersion - Enter “1.1” for the control protocol version.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
5. **changeMP** - Method that changes a provisioned MP information into the CS2k Mgr. This method has the following parameters:
- Input data:
    - usn



- version
- MPname - unique name for the MP to be changed
- IPAddress - The new IPAddress of the MP device.
- Output data:
  - usn (value should be the same as the input)
  - version (value should be the same as the input)
  - ReturnCode
- 6. **deleteMP** - Method that deletes provisioned MP information from the CS2k Mgr. This method has the following parameters:
  - Input data:
    - usn
    - version
    - MPname - unique name for the MP to be deleted
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
- 7. **addRU** - Method that creates resource usage information into the CS2k Mgr. This method has the following parameters:
  - Input data:
    - usn
    - version
    - RUDescription - A unique String to label this RU profile
    - RUValue - an RU Value must be entered for every Codec/Packetrate combination that has been created in the CS2k Mgr. An RUValue consists of the following three parameters.
      - Codec - The Codec that this value refers to
      - PacketRate - The packet is at ion rate this value refers to
      - Value - The VCAC value for a call using this codec/packetrate.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode

8. **changeRU**- Method that changes provisioned RU information into the CS2k Mgr. This method has the following parameters:
  - Input data:
    - usn
    - version
    - RUDescription - The RU profile to change
    - RUNewDescription (Optional - not allowed with RUValue)- The New name of the RU profile
    - RUValue (Optional - not allowed with RUNewDescription) - The full list of RU values for this RU profile, this will overwrite the existing values.
    - Codec (Optional - not allowed with RUNewDescription) - The Codec that this value refers to
    - PacketRate (Optional - not allowed with RUNewDescription) - The packet is at ion rate this value refers to
    - Value (Optional - not allowed with RUNewDescription) - The VCAC value for a call using this codec/packetrage.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
9. **queryRU** - Method that queries provisioned RU information from the CS2k Mgr. This method has the following parameters:
  - Input data:
    - usn
    - version
    - RUDescription (Optional if omitted all RU profiles are returned)- The RU profile to query
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - RUDescription - If RUDescription committed from query then a list of multiple description fields are returned.
    - RUValue returned if a RUDescription query was requested. A value for every Codec/Packetrage combination is returned, this comprises of the following three parameters.
    - Codec returned if a RUDescription query was requested.

- PacketRate returned if a RUDescription query was requested.
  - Value returned if a RUDescription query was requested.
  - ReturnCode
- 10. deleteRU** - Method that deletes provisioned RU information from the CS2k Mgr. This method has the following parameters:
- Input data:
    - usn
    - version
    - RUDescription - The RU profile to be deleted
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
    -
- 11. addLBL** - Method that creates Limited Bandwidth Link information into the CS2k Mgr. This method has the following parameters:
- Input data:
    - usn
    - version
    - LBLname - A unique name for the LBL device
    - CounterGWC (optional) a Counter GWC IP address, if omitted the Counter IPaddress is automatically allocated.
    - RUDescription - The RU profile that this LBL device is using, the RU profile must exist already in the CS2k Mgr.
    - MaxCount - The maximum value that this LBL can handle with respect to the number of calls using the Codec/Packetrate as defined in the RU profile.
    - ParentMB - The parent middlebox name, a link into a middlebox hierarchy. The parent middlebox device must already be in the CS2k Mgr.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
- 12. changeLBL** - Method that changes provisioned LBL information in the CS2k Mgr. This method has the following parameters:

- Input data:
    - usn
    - version
    - LBLname - The name for the LBL device to change.
    - CounterGWC (optional) a new Counter GWC IP address.
    - RUDescription (optional) - The new RU profile, the RU profile must exist already in the CS2k Mgr.
    - MaxCount (Optional)- The new maximum value.
    - ParentMB (Optional)- The new parent middlebox name. The parent middlebox device must already be in the CS2k Mgr.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode
- 13. queryLBL** - Method that queries provisioned LBL information from the CS2k Mgr. This method has the following parameters:
- Input data:
    - usn
    - version
    - LBLname (Optional, cannot be included as well as GWCname)- A Unique Name of a LBL device, to get full info on a device
    - GWCname (Optional, cannot be included as well as LBLname) - To obtain a list of all LBLs on a GWC (Use GWC-XX format)
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - LBLname - if GWCname option used above, then a list of LBLnames returned without the full info on each device
    - CounterGWC returned if LBLname option used.
    - RUDescription returned if LBLname option used.
    - MaxCount returned if LBLname option used.
    - ParentMB returned if LBLname option used.
    - ReturnCode

**14. deleteLBL** - Method that deletes provisioned LBL information from the CS2k Mgr. This method has the following parameters:

- Input data:
  - usn
  - version
  - LBLname - The LBL device to be deleted
- Output data:
  - usn (value should be the same as the input)
  - version (value should be the same as the input)
  - ReturnCode

***Product = CS 2000 - GWC***

## **A00007101--GWC Telnet Authentication**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP, UA-IP, IAW, CHS, PT-AAL2

#### **1.2 Description**

This activity replaces the existing login mechanism for accessing the PMDebug on the GWC (telnet to GWC IP address, “gonow”, or use serial port) with a user-id/password login system which has a standard look and feel. Currently, no user-id is prompted, and the password is only required for telnet from a non-EM IP address.

Every user connecting to a GWC will see a standard login banner (not changeable) and a generic login prompt. Both a user-id and password are required, and when entering the password, it will not be echoed. Telnet connections from any device or serial port connections behave identically. User-ids are used as defined on the IEMS security server, and any account there which has “mgcadm” group privileges will be able to log in to a GWC. Five failing login attempts will result in a disconnected telnet session. Successful login will connect directly into PMDebug.

Functionality similar to the existing “force out” will be available. Any user-id which can log in, may force out another user on any interface. A login session left idle (no input) for 10 minutes will be automatically disconnected.

There will be a default “local” access user-id/password always available on the GWC. The existing GWC login mechanism from the Core is not impacted. The local account login is only checked if the login attempt with the security server has failed. The local password has the following characteristics:

- It is changeable, done by using the ‘Passwdchg’ and ‘Passwdreset’ commands. These new commands are grouped together in a new top-level directory called ‘Access.’
- It is stored in a NVRAM which means in the event the GWC card is restarted, reloaded or locked/unlocked or pulled out and then inserted back into the slot the local password still survives.
- The default local password is the MAC address of the GWC card. The MAC address as a password should be entered as its full ASCII representation of 12 hexadecimal characters, such as ‘0001AF02A3FC’ in all capital letters with no separators.

An idle timer is established, with a default of 30 minutes. The default can be changed by using the ‘Idletimer’ command available on the new PMDebug level named ‘Access.’

This activity will add a number of new security logs (syslog local3/info) which will be stored in /var/log/securitylog on the CS2M server and forwarded upstream. Based on interpretation of the reference docs and requirements, there will be at least events for the following:

- telnet connection from remote host,
- serial connection,
- login attempted,
- login result,
- authentication server unreachable,
- logout (by request, force out, or idle timeout),
- local account login,
- local password change/reset,
- GWC restart,
- GWC reload

## 1.3 Hardware Requirements or Dependencies

None

## 1.4 Software Requirements or Dependencies

Authorization of defined or new users is controlled by group memberships managed by the IEMS security system, which includes a set of standard group privileges. Only and All user-ids which are members of the “mgcadm” group will be able to log in to GWCs. All SN08 GWCs will utilize the new login system, and there is no “backwards compatibility” allowing the use of the old “gonow” login after the completion of the feature.

If a SSPFS box hosting IEMS is not accessible from the CS2M, it may respond with authentication reflecting it’s local password/group setup, and that should be an acceptable fallback mechanism.

## 1.5 Limitations and restrictions

Only as noted above in descriptions.

## 1.6 Interactions

Other authentication/logins for the GWC are not affected (e.g. SNMP community, FTP login). The interruption from the core login to retrieve trap data (“CC Trapinfo logged on”) will still occur.

# *Product = CS 2000 - GWC*

## **A00007102--Dual C-Side IP for GWC**

### *Functional Description*

#### **1.1 Applicable Solution(s)**

DMS, PT-AAL2

#### **1.2 Description**

This feature will eliminate the requirement to provision a default gateway IP address when provisioning a GWC. The gateway IP will be automatically provisioned for all GWCs. This eliminates provisioning errors. When the call server is an XA-Core, the two available core IP addresses will be automatically distributed across the GWCs. The Call Server IP is not displayed on the GWC Provisioning panel for the individual GWC. Instead, it is shown on the ‘General Network Settings’ panel.

#### **1.3 Hardware Requirements or Dependencies**

None

## 1.4 Software Requirements or Dependencies

This is a new gateway controller element manager feature contained within the CS2M software load.

## 1.5 Limitations and restrictions

None

## 1.6 Interactions

None

## 1.7 Glossary

| Term | Description        |
|------|--------------------|
| GWC  | Gateway Controller |

# 2: Fault Management

## 2.1 Fault management strategy

## 2.2 Fault management tools and utilities

There are two CMT alarm GUIs. One shows active alarms on the managed devices and the other shows the alarm history. This activity will update alarms associated with the GWCEM.

## 2.3 Logs

An automatically generated customer log on raising an alarm will be provided. No other log will be implemented in this feature.

In this feature, the new alarm “No Available Call Server IP” will be added, a corresponding customer log when the alarm is raised/cleared will be automatically generated. The log file is “/var/log/customerlog”.

### 2.3.1 Formats

The **log header** will be organized as in the following format:

|                |          |
|----------------|----------|
| Report name:   | CMT      |
| Report number: | 303      |
| Priority:      | Critical |
| Event:         | TBL      |



Device ID: CMT

Label: Fault

Application name: CS2K Config Manager

The **log body** will be organized as in the following format:

<Location> <NotificationID> <State> <Category> <Cause> <Time>  
<Component Id> <Specific Problem> <Description>

Please refer to the following table for log body field details.

#### 2.3.1.1 NTSTD

#### 2.3.1.2 SCC2

#### 2.3.1.3 Syslog

#### 2.3.1.4 SNMP

**Table 1 Log Body Fields**

| Field Name       | Used (Y/N) | Value(s)                          | Fixed/Variable | Description                            |
|------------------|------------|-----------------------------------|----------------|----------------------------------------|
| Location:        | Y          | 47.166.56.10                      | variable       | IP address                             |
| Notification Id: | Y          | 14                                | variable       | 1-3 digits                             |
| State:           | Y          | Raised                            | fixed          | constant - values: "Raised", "Cleared" |
| Category:        | Y          | environmentalAlarm                | fixed          | constant                               |
| Cause:           | Y          | configurationOrCustomizationError | fixed          | constant                               |
| Time:            | Y          | <MMM dd:hh:mm:ss YYYY>            | fixed          | Time stamp                             |
| Component Id:    | Y          | CS2K Config Manager               | variable       | constant                               |

#### 2.3.1.5 Integrated Element Manager GUI Fields

### 2.3.2 Explanation

### 2.3.3 Field descriptions

### 2.3.4 Action

### 2.3.5 Associated Operational Measurements or Performance Measurements

### 2.3.6 Additional information

## 2.4 Alarms

One new alarm “No Available Call Server IP” will be raised if the SESM cannot get any available C-Side IP address from the Core. The alarm can be viewed via the Alarm Manager on the CS 2000 Management Tools GUI. If the Call Server IP can be obtained later, then the alarm is cleared.

### 2.4.1 Alarm format

The format of this alarm should be:

|                         |                                                                                                                              |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element:</b> | CS2K Config Manager                                                                                                          |
| <b>Alarm Level:</b>     | Critical                                                                                                                     |
| <b>Category:</b>        | Environment                                                                                                                  |
| <b>Alarm Time:</b>      | <Data and time when the alarm was raised>                                                                                    |
| <b>Probable Cause:</b>  | No Call Server IP was filled in Core table <Table Name>.                                                                     |
| <b>Description:</b>     | SESM cannot get available the Call Server IP address information from the Core. This information is necessary for every GWC. |

### 2.4.2 Cause or condition

This scenario will happen if no C-Side IP address was filled in table CMIPADDR on the XA-Core or table IPNETWRK on the Compact Core.

### 2.4.3 Integrated Element Manager GUI Fields

### 2.4.4 SNMP Northbound Alarm Event (Non-legacy logs only)

### 2.4.5 Explanation

Description: SESM cannot get available Call Server IP information from the Core, this information is necessary for every GWC, the reason is that no Call Server IP information was filled in the Core table.

Severity: The severity level of this new alarm is Critical.

### 2.4.6 Action

Action is required to properly fill the Core table manually (Table CMIPADDR on the XA-Core or table IPNETWRK on the Compact Core). SESM will check the table periodically every 5 minutes. Once SESM can get at least one available Call Server IP address from the Core table, this alarm will be cleared.

### 2.4.7 Corresponding Clear Log

## 2.5 Related documentation

## 3: Configuration

### 3.1 Hardware and Software Requirements

This feature makes changes to the Gateway Controller Element Manager GUI.

### 3.2 Initial Configuration

Launch the Gateway Controller Element Manager.

### 3.3 Office/Subnet parameters (OP/SP) (CM & SESM)

No parm changes.

### 3.4 Upgrade Considerations

None

### 3.5 Data schema (DS) (CM, MIBS, RDB)

#### 3.5.1 New/modified tables, MIBs, or Database Schema

Table 2 New or modified tables

| Table/MIB name         | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|------------------------|--------------------------|------------------------------------|
| INVENTORY.ROLES        | Changed                  | Old                                |
| INVENTORY.ELEMENTTY PE | Changed                  | Old                                |

**Table 2 New or modified tables**

| Table/MIB name    | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|-------------------|--------------------------|------------------------------------|
| INVENTORY.ELEMENT | Changed                  | Old                                |

### 3.5.1.1 SESM Table INVENTORY.ROLES

#### 3.5.1.1.1 Functional description

At the SESM server, this table defines all element roles. In order to support new element “C-Side IP address” storage in the Inventory database, a new role will be added into this table.

#### 3.5.1.1.2 Fields

No structure changes on this table.

#### 3.5.1.1.3 Datafill example

The new role will be defined as in the following datafill.

**Table 3 INVENTORY.ROLES: New pre-defined role**

| NAME | TYPE       | DESCRIPTION            |
|------|------------|------------------------|
| CSIP | IP address | Core c-side IP address |

### 3.5.1.2 SESM Table INVENTORY.ROLES

#### 3.5.1.2.1 Functional description

At the SESM server, this table defines all element types. In order to support new element “C-Side IP address” storage in the Inventory database, a new type will be added into this table.

#### 3.5.1.2.2 Fields

No structure changes on this table.

#### 3.5.1.2.3 Datafill example

The new role will be defined as in the following datafill.

**Table 4 INVENTORY.ELEMENTTYPE: New pre-defined element type**

| NAME       | TYPE       | CATEGORY |
|------------|------------|----------|
| IP address | IP address | Logical  |

### 3.5.1.3 SESM Table INVENTORY.ELEMENT

#### 3.5.1.3.1 Functional description

This table will be used to store the new element “C-Side IP address” retrieved from the Core. Up to two CSIPs will be stored in this table, the element name should be “CSIP-0” and “CSIP-1”.

#### 3.5.1.3.2 Fields

No structure changes on this table.

#### 3.5.1.3.3 Datafill example

The new element will be filled as in the following sample.

**Table 5 INVENTORY.ELEMENTTYPE: Usage sample for CSIP storage**

| ELEMENTID | PARENTID | ROLE | TYPE       | IP ADDRESS    | EMID | LAUNCHURL | OWNERID |
|-----------|----------|------|------------|---------------|------|-----------|---------|
| CSIP-0    | COMPACT5 | CSIP | IP address | 47.142.128.24 | -    | -         | XaCore  |
| CSIP-1    | COMPACT5 | CSIP | IP address | 47.142.128.25 | -    | -         | XaCore  |

Note:

- Element ID will be filled with the format “CSIP-<nn>”, where the <nn> is a valid number starting from 0. Every CSIP record will use a unique number.
- PARENTID will be filled as the current configured CM CLLI.
- EMID and LAUNCHURL will be filled as blank as they are not required for the CSIP record.
- OWNER ID will always be filled as “XaCore”.

## 3.6 Service Orders (SO) (CM & SESM)

None

## 3.7 Software optionality control (SOC)

None

## 3.8 Element Management

### 3.8.1 New/modified GUIs

**Table 6 New or modified GUIs**

| GUI name            | NEW, CHANGED, or DELETED |
|---------------------|--------------------------|
| GWC Network Display | Changed                  |

**Table 6 New or modified GUIs**

| <b>GUI name</b>        | <b>NEW, CHANGED, or DELETED</b> |
|------------------------|---------------------------------|
| GWC Display            | Changed                         |
| Add Gwc Node Interface | Changed                         |

### **3.8.2 GUI information**

The first screen GWC Network Display has been modified to accommodate the C-Side IP addresses, which have been shifted here in respect of the requirement to have C-Side IP common to the entire network rather than to individual GWC's. The first snapshot is of the GWC Network Display Panel:



**Figure 1 GWC Network Display Panel**

ment Tools - 172.16.17.5 (CM CLI: INDIA1LAB)

guration Maintenance Windows Help

**Controller**

Network Configuration

Network Codec Profile | DQoS Configuration | VCAC Resource Usage

| Name                   | Bearer Network Type | Codec Selection | Packetization Rate |     |
|------------------------|---------------------|-----------------|--------------------|-----|
| Network_Default_Pro... | IP                  | G.711-a law     | 10 ms              | Dis |

Go To

ollers:

Network Devices

PEP Servers | Media Proxies | IP-VPNs (Virtual NATs) | Limited BW Links (LBL) | QoS Collectors | Location Recipient

Location Recipient DNS: <not configured>  
Location Recipient IP Address: <not configured>  
Location Recipient Port Number: <not configured>

Change...

General Network Settings

GWC default domain name: <not configured>  
Call Agent id: <not configured>  
Auto Imaging: disabled

Change...

Next >

12, 2004 11:24 AM

C-Side IP Address0: 172.16.16.12  
C-Side IP Address1: 172.16.16.12

Once the first requirement is met, we need to eliminate the redundancy of having the Message Router IP address at every GWC Display Panel. To achieve this we remove the Message Router IP address at the GWC Display Level. This is how the GWC Display Panel looks after it has been modified:



**Figure 2 Removal of Message Router IP address from GWC Display Panel**

Management Tools - 172.16.17.5 (CM CLI: INDIA1LAB)

Configuration Maintenance Windows Help

ps

y Controller

Gateway Controller

id

Go To

Controllers:

GWC-0 Unit 0: 172.16.16.26  
Unit 1: 172.16.16.27

Maintenance Provisioning

Controller Gateways Lines Carriers Media Proxies QoS Collectors IPsec

IP Addresses \_\_\_\_\_ Element Manager \_\_\_\_\_

Active: 172.16.16.24 IP address: 172.16.17.5

Inactive: 172.16.16.25 SNMP port: 161

Unit 0: 172.16.16.26 Trap port: 162

Unit 1: 172.16.16.27

Profile \_\_\_\_\_ XA-Core \_\_\_\_\_

Current: SMALL\_LINEINTL Change...

Node number: 45

| Capability            | Capacity | Units       |
|-----------------------|----------|-------------|
| Lines                 | 6400     | ports       |
| Dynamic Quality of... | 20       | connections |
| Small Gateways        | 6400     | gateways    |
| IP Security           | NA       | NA          |
| Kerberos              | NA       | NA          |

| Exec Lineup |      |
|-------------|------|
| POTSEX      | POTS |
| KSETEX      | KEYS |

General Settings \_\_\_\_\_

☐ Enable Location Identification rep

Bearer Network and Codec Profile \_\_\_\_\_

Bearer network: <none>

Bearer fabric type: IP

Codec Profile: Network\_Default\_Profile Change...

Next >



Also since the Provisioning has been changed to auto-provisioning, the need for manual provisioning does not arise. Hence we need to modify the 'Add GWC Interface' where we insert the Message Router IP address. We remove the Message Router IP address from this panel. The screen after this modification looks as shown below:

**Figure 3 Removal of Message Router IP address from Add GWC Node**

**Add Gateway Controller**

Gateway controller name: GWC-

Gateway controller active IP address:

GWC Profile Information

Gateway controller profiles:

Tone data:

| Term Type | Exec Data |
|-----------|-----------|
|-----------|-----------|

| Capability | Capacity |
|------------|----------|
|------------|----------|

GWC Bearer Networks and Codec Profile Information

Bearer networks:

GWC codec profile:

OK Cancel

### 3.8.2.1 GUI name: GND Panel

GWC Network Display Panel

### 3.8.2.1.1 Functional description

This panel is used for representing the attributes that occur across the network of GWCs rather than for each GWC. The GUI can be invoked through the CMT application. Once we invoke the application we get the CS2000 Management Tools Screen. On this screen we will find a Folder GUI with 'Device Types' written alongside it. Under this we will find 'Gateway Controller'. On clicking the 'Gateway Controller', we get a page which has a section called 'General Network Settings'. Under this we find our required information 'C-Side IP addresses'.

### 3.8.2.1.2 GUI usage and implications

N/A.

### 3.8.2.1.3 GUI size

Table 7 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| G N D Panel          | N/A               | N/A               | N/A.                  |

### 3.8.2.1.4 GUI fields

Table 8 GUI field descriptions

| Field                     | New or Changed | Subfield | Entry  | Explanation and action | Associated MIB entry |
|---------------------------|----------------|----------|--------|------------------------|----------------------|
| <i>coreIPAddressText1</i> | New            | ---      | String | Default = Null         |                      |
| <i>coreIPAddressText2</i> | New            | ---      | String | Default = Null         |                      |

### 3.8.2.1.5 Usage example

N/A

### 3.8.2.1.6 GUI release history update

The C-Side IP addresses were added to the GWC Network Display Screen. Hence we get a Network common view of the C-Side IP addresses.

### 3.8.2.1.7 Context sensitive launching information

N/A

### 3.8.2.1.8 Supplementary information

N/A.

## 3.8.2.2 GUI name: G D Panel

GWC Display Panel

### 3.8.2.2.1 Functional description

This panel is used for representing the attributes corresponding to each GWC, i.e. each panel represents a GWC in the Network. We remove the Core IP address as we have settled for the Core IP address on a Network level rather than on a GWC level. The GUI can be invoked through the CMT application. Once we invoke the application we get the CS2000 Management Tools screen. On this screen we will find a folder GUI with 'Device Types' written alongside it. Under this we will find 'Gateway Controller'. On clicking the 'Gateway Controller', we get a 'Gateway Controllers' display. Under this will be displayed the list of all GWCs in the network. On clicking on any one of the list, we get the GWC display for that listed GWC. We get 2 tabbed panes to select, the first is 'Maintenance' and the second is 'Provisioning'. Take 'Provisioning' and in that take the next pane 'Controller', here we remove the display for the Message Router IP address and end up having only IP address' and 'Element Manager'.

### 3.8.2.2.2 GUI usage and implications

N/A.

### 3.8.2.2.3 GUI size

Table 9 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| G D Panel            | N/A               | N/A               | N/A.                  |

### 3.8.2.2.4 GUI fields

No new fields added or changed.

### 3.8.2.2.5 Usage example

N/A.

### 3.8.2.2.6 GUI release history update

The GWC Display panel has been changed by the Removal of the 'Message Router IP address' from the panel.

### 3.8.2.2.7 Context sensitive launching information

N/A.

### 3.8.2.2.8 Supplementary information

N/A.

### 3.8.2.3 GUI name: Add GWC Node Interface Panel

#### 3.8.2.3.1 Functional description

We have moved from the Manual Provisioning of the GWC Message Router IP address to the Auto Provisioning of the C-Side IP address. The GUI can be invoked through the CMT application. Once we invoke the application we get the CS2000 Management Tools screen. Here on the toolbar we get a Configuration button and when we click the button a drop down menu is obtained. On the drop down menu we have an option of 'Add GWC Node'. When we click on this option we get a Add GWC Node interface. Here we have modified the interface, so as to avoid manually setting the Message Router IP address.

#### 3.8.2.3.2 GUI usage and implications

N/A.

#### 3.8.2.3.3 GUI size

Table 10 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| Add GWC Node I/f's   | N/A               | N/A               | N/A.                  |

#### 3.8.2.3.4 GUI fields

No new fields added or changed.

#### 3.8.2.3.5 Usage example

The following the interface is used when we need to add a new GWC to the network. In the CMT application we go to the Configuration--> Add GWC Node interface. Here in this interface we can add a new GWC.

#### 3.8.2.3.6 GUI release history update

The modification we have made here is that we have removed the Message Router IP address from this interface, so that we avoid manually provisioning the C-Side IP address.

#### 3.8.2.3.7 Context sensitive launching information

N/A.

#### 3.8.2.3.8 Supplementary information

N/A.

### 3.8.3 CLUI Interface

The CLUI interface is modified such that the C-Side IP addresses are displayed on a Per-GWC basis.

Note : Currently CLUI does not support the Network level interface. All existing interfaces focus on the per GWC level. This will make it inconsistent between CLUI and GUI (GUI now only supports the C-Side IP address on a Network level.). Since we do not extend CLUI support to the customer , these inconsistencies are acceptable at this moment.

### 3.9 User interface changes

None

### 3.10 OSSGate Interface Changes

#### 3.10.1 XML Command Changes

- a Add GWC: the new XML command change is that during adding a GWC. Here we need to forgo the need to pass the Message Router IP address and Message Router port.
- b Query GWC: the other is when we get a response for a Query for the GWC. Here the response is changed so that Message Router IP address and Message Router port are not displayed.

##### 3.10.1.1 Command XML

- a Add GWC: here we need to remove the XML reference to the Message Router IP address and the Message Router port. The red indicates the lines that will be removed.

**Example:**

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<CommandList >
<Command>
<Interface>cs2kCfgMgrIf</Interface>
<Methods>
<addGWctoCS usn="1" version="1.0">
<Parameters>
<csUIName>COMPACT5</csUIName>
<gwcUIName>GWC-0</gwcUIName>
<profileName>TRUNKNA</profileName>
<gwcActvIp>47.142.128.36</gwcActvIp>
<gwcSnmpPort>161</gwcSnmpPort>
<msgRouterIp>47.142.128.24</msgRouterIp>
<msgRouterIpPort>4684</msgRouterIpPort>
</Parameters>
</addGWctoCS>
</Methods>
</Command>
</CommandList>
```

- b** Query GWC: no changes in the Query GWC Command.

**Table 11 XML Command Tag Descriptions**

| tag name | description of valid values |
|----------|-----------------------------|
| N/A      |                             |
| N/A      |                             |

**3.10.1.2 Response XML**

- a** Add GWC: no changes on the response side for Add GWC.
- b** Query GWC: The display here will not have the Message Router IP address and Message Router port. The red indicates that those lines will not be displayed.



**Example:**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Response>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <queryGWC usn="1" version="1.0">
        <ReturnData>
          <Row>
            <gwcUList>GWC-3</gwcUList>
            <gwclpList>47.142.128.52</gwclpList>
            <callServerId>COMPACT5</callServerId>
            <nodeName>GWC 3</nodeName>
            <typeList>2</typeList>
            <typeList>8</typeList>
            <typeList>15</typeList>
            <xacNodeNumber>24</xacNodeNumber>
            <actvIpAddress>47.142.128.52</actvIpAddress>
            <snmpPort>161</snmpPort>
            <mktTones>NORTHAM</mktTones>
            <termTypes>ABTRK</termTypes>
            <termTypes>AB250</termTypes>
            <termTypes>PRAB</termTypes>
            <pmExecs>GWCEX</pmExecs>
            <pmExecs>GWC250</pmExecs>
            <pmExecs>UTR250</pmExecs>
            <capacity>4094</capacity>
            <externalIP>NOT_YET_SUPPORTED</externalIP>
            <externalPort>0</externalPort>
            <msgRtrIP>47.142.128.24</msgRtrIP>
            <msgRtrPort>4684</msgRtrPort>
            <bearerNetworkName>IP</bearerNetworkName>
            <bearerFabricType>IP</bearerFabricType>
            <codecProfileName>IP_default</codecProfileName>
          </Row>
          <RC>0</RC>
          <MsgTxt>Query of a Single GWC was successful</MsgTxt>
        </ReturnData>
      </queryGWC>
    </Methods>
  </Response>
</CommandList>
```

**3.10.2 Additional OSSGate Changes**

N/A.

**3.11 Security**

None

**3.12 Configuration Walkthrough**



## ***Product = CS 2000 - GWC***

### **A00007113--GWC External Interface Robustness**

#### ***Functional Description***

#### **3.1 Applicable Solution(s)**

PT-IP, PT-AAL2

#### **3.2 Description**

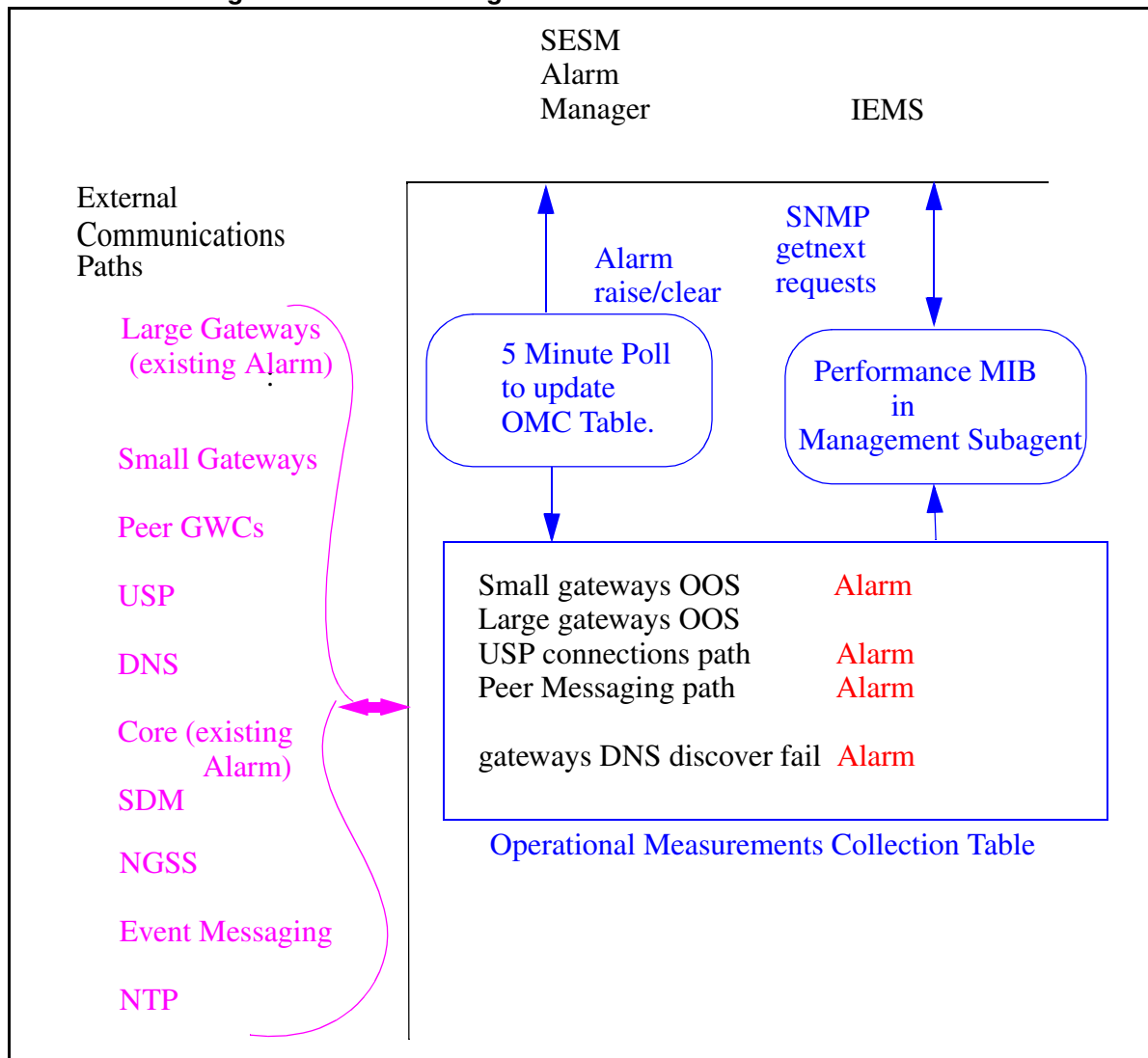
This feature is aimed at enhancing error reporting of external communication paths from the Gateway Controllers (GWCs) and External hosts such as gateways, peer GWCs and USP. New alarms are added to report communication path lost and new Operational Measurements (OMs) are collected by IEMS every 5 minutes.

The customer will use the existing SESM alarm manager for the new alarms. IEMS will be configured to receive the new OMs every 5 minutes. Only the Active GWC will report the OMs, while the inactive will report no OMs found in table.

All the OMs are only pegged on the active GWC units, and they won't retain over a reload/SWACT SWACT/COLD SWACT of a GWC unit. This means that whenever a reload/SWACT SWACT/COLD SWACT occurs on the GWC unit, the values of those OMs on that unit will all be reset, and the alarms previously raised are also cleared. No alarm will be raised for the inactive GWC unit.

The behavior diagram below shows all the GWC communication paths and which ones have been included for OM collections as part of this feature.

Five new alarms are introduced in this feature and their detail description is in the optfm.did section of the document.

**Figure 1 Behavior Diagram**

### 3.3 Hardware Requirements or Dependencies

Not Applicable.

### 3.4 Software Requirements or Dependencies

This functionality is available for SN08 and above.

### 3.5 Limitations and restrictions

The new OMs for USP require a configuration of direct messaging between GWC and USP

Due to time constraints, the following interfaces will be handled in future releases:

SDM - This interface is used for the bootptab file. In future releases the bootptab file will be moved to the SSPFS host where the SAM21-EM resides.

NTP - Network Time Protocol Server. When this interface is not there, the battery operated clock on the GWC is used to get the time.

NGSS - counters and alarms will be added in later releases.

Event Messaging - counters and alarms will be added in later release.

### 3.6 Interactions

Not Applicable.

### 3.7 Glossary

| Term | Description              |
|------|--------------------------|
| GWC  | Gateway Controller       |
| OM   | Operational Measurements |

## 4: Fault Management for A00007113

### 4.1 Fault management strategy

The **GWC External Interface Robustness** feature provides improved fault management for existing Gateway Controller (GWC) components. The strategy for this feature is covered by two aspects: Collecting Operational Measurements (OMs) with error counters, and raising alarms based on the error counters.

### 4.2 Fault management tools and utilities

The scope of this feature in perspective to fault management is to provide a method of reporting information to the end-user; all tools and utilities for the analysis and handling procedures are controlled and maintained by the SESM Alarm manager or IEMS.

The SESM Alarm manager on the SSPFS is used to display the GWC alarms and log alarms history. Alarms can be filtered for display purposes, based on the alarm severity field.

The Operational Measurements will be collected by IEMS polling covered in feature ACTID A00007388.

## 4.3 Alarms

### 4.3.1 External Host Interface Signal Loss

**Category:** Communication

**Description:** External Communication Interface

**Severity:** Based on number of Elements involved and the number of elements with a signal loss collected with a 5 minute poll.

- Critical - Over 50% signal loss
- Major - Over 20% signal loss
- Minor - Any signal loss

**Cause:** Signal Loss.

**Interface or Specific Problem:** This field provides the external host type.

- “Small GWs in Disabled State”

This alarm is based on the number of gateways that are out of service as compared to the number of gateways provisioned checked on a 5 minute polling period. Therefore, with very few gateways provisioned, few gateways out of service will have a more significant effect on call processing. Gateways are considered out of service when the heartbeat messages between the GWC and the gateway are lost.

Customer logs are sent as each small lines gateway goes out of service and when it comes back in service. The customer should use the alarm as an indication that there is a problem with the small lines gateways. It can use the new OM collected to see how many small lines gateways are out of service and then use the customer logs to identify the gateways that need attention.

- “USP SS7 paths disabled”

This alarm is based on the number of USP connections that are out of service as compared to the number of maximum paths of 2 checked on a 5 minute polling period. The link paths are considered out of service when the heartbeat messages between the GWC and the USP are lost.

The customer should view the alarm as an indication that there is a problem with the USP connections. A Major alarm is raised when both links are down while a minor alarm is raised if only one link is down. Since not all calls require SS7 signaling, this messaging path does not raise any critical alarms.

• “Peer connections failed during interval”

This alarm is based on the number of call setups failed as compared to the number of calls attempted in a 5 minute polling period. In this case as the number of calls is increased, the number of failed calls is not as significant for the alarm.

The customer should view this alarm as an indication of a problem with calls and look at the new Peer Communications OMs to see the number of calls failed over a longer period.

**Action:** Verify the Ethernet link to between the GWC and the remote host or Peer GWCs.

#### 4.3.2 External Host Interface Configuration Error

**Category:** Quality of Service

**Description:** External Communication Interface

**Severity:** Non service effecting errors are warning alarms.

**Cause:** Configuration Or Customization Error.

**Interface or Specific Problem:** This field provides the external host type.

• “DNS failed GW discovery”

This alarm is based on the number of gateways that failed DNS lookup. This alarm is based on a 5 minute polling period. The new DNS OMs can be used to see the number of gateways that are not discovered and also the number of gateways that were discovered using RSIP. Note that RSIP discovery does not survive a Cold Swact on the GWC, which may result in long outages for the customer.

**Action:** Verify the DNS server entries for every gateway.

#### 4.3.3 External Host Interface Protocol Error

**Category:** Communication

**Description:** External Communication Interface

**Severity:** Based on service effecting.

- Major - effects some callp service.
- Minor - redundancy error.

**Cause:** Communications Protocol Error.

**Interface or Specific Problem:** This field provides the external host type.

- "USP SS7 path not Active"

This alarm is based on the number of USP connections that are not active but do have heartbeat messages checked on a 5 minute polling period. Therefore this is a protocol error with USP.

The customer should you the alarm as an indication that there is a problem with the USP connections. A Major alarm is raised when both links are not active while a minor alarm is raised if only one link is not active.

**Action:** Verify the USP configuration to the GWC.

#### 4.4 Operational Measurements or Performance Measurements

Every new alarm in this feature will have associated measurements that will be reported using the performance MIB. The Specific problem field in the alarm is also the name of the metric that will be reported. The relationship between alarms and performance metrics are as follows:

The Alarm **Category** will be used as the Group in the performance metric.

- Measurement
- Communication
- Quality of Service

The alarm **Interface or Specific Problem** will be used as the name for the metric.

**Table 3: Performance Measurements Metrics**

| name                          | Group         | Source | Type       |
|-------------------------------|---------------|--------|------------|
| "Small GWs in Disabled State" | communication | multi  | COUNTER_32 |
| "Large GWs in Disabled State" | communication | multi  | COUNTER_32 |
| "Trunk GWs in Disabled State" | communication | multi  | COUNTER_32 |
| "Audio GWs in Disabled State" | communication | multi  | COUNTER_32 |

**Table 3: Performance Measurements Metrics**

| name                                         | Group               | Source | Type       |
|----------------------------------------------|---------------------|--------|------------|
| "Total Gateways Provisioned"                 | measurement         | multi  | COUNTER_32 |
| "DNS failed GW discovery"                    | quality of service  | multi  | COUNTER_32 |
| "DNS good GW discovery"                      | measurement         | multi  | COUNTER_32 |
| "RSIP used in GW discovery"                  | quality off service | multi  | COUNTER_32 |
| "Total DNS GWs to discover"                  | measurement         | multi  | COUNTER_32 |
| "USP SS7 paths disabled"                     | communication       | multi  | COUNTER_32 |
| "USP SS7 path not Active"                    | communication       | multi  | COUNTER_32 |
| "Peer connections failed during interval"    | communication       | multi  | COUNTER_32 |
| "Peer connections completed during interval" | communication       | multi  | COUNTER_32 |
| "Peer connections attempted during interval" | measurement         | multi  | COUNTER_32 |

***Product = CS 2000 - GWC***

## **A00007327--Media Proxy 5 and 30 minute Operational Measurements**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

CHS

#### **1.2 Description**

This feature implements a number of Media Proxy specific Operational Measurements (OMs) on the Gateway Controller (GWC) to be collected by IEMS at 5 minute intervals. These metrics can be used by the crafts person to diagnose problems with Media Proxy usage and identify requirements to better engineer the network to handle internet transparency calls.

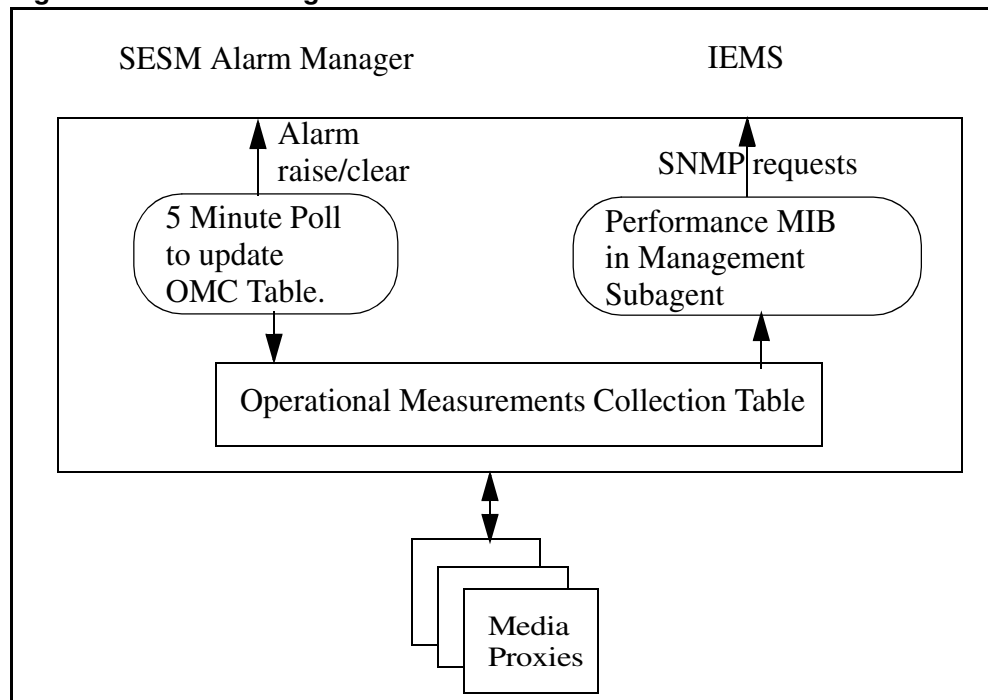
The OMs covered are number of passed and failed calls per Media Proxy and per GWC for every 5 & 30 minute interval. A Media Proxy communications path lost alarm is also added by this feature. The detailed description of the

OMs and alarm can be found in the Performance Management and Fault Managements sections of this feature, respectively.

The customer will use the existing SESM alarm manager for the new alarm. IEMS will be configured to receive the new OMs every 5 minutes. The 30 minute OMs are only updated and reported every 30 minutes, 30 minute periods are aligned with the 5 minute OM poll period on the GWC. Only the active GWC will report the OMs, while the inactive will report no OMs found in table.

This feature is intended to complement the OMs that are already available for the RTP Portal via IEMS and gives the GWC view of calls as oppose to the Media Proxy view.

**Figure 1 Behavior Diagram**



### 1.3 Hardware Requirements or Dependencies

Not applicable.

### 1.4 Software Requirements or Dependencies

This functionality is available for SN08 and above.

### 1.5 Limitations and restrictions

Not applicable.



## 1.6 Interactions

Not applicable.

## 1.7 Glossary

| Term | Description                                |
|------|--------------------------------------------|
| GWC  | Gateway Controller                         |
| IEMS | Integrated Element Management System       |
| OM   | Operational Measurement                    |
| SESM | Succession Element and Sub-Element Manager |

### *Fault Management for A00007327*

#### 2.1 Fault management strategy

The **Media Proxy 5 and 30 minute** OMs feature provides operational measurements for calls involving media proxies and alarms for lost communication with media proxies.

#### 2.2 Fault management tools and utilities

The scope of this feature in perspective to fault management is to provide a method of reporting information to the end-user; all tools and utilities for the analysis and handling procedures and controlled and maintained by the SESM alarm manager or IEMS.

The SESM Alarm manager on the SSPFS is used to display the GWC alarms and log alarms history. Alarms can be filtered for display purposes, based on the alarm severity field.

#### 2.3 Alarms

##### 2.3.1 Media Proxy Communications Failure

**Category:** Communication

**Description:** Media Proxy Communications Failure

**Severity:** Based on number of elements involved and the number of elements in a disabled state collected with a 5 minute poll.

- Critical - Over 50% of media proxies disabled
- Major - Over 20% of media proxies disabled
- Minor - Any media proxies disabled

**Cause:** Signal loss

This alarm is based on the number of media proxies that are out of service as compared to the number of media proxies provisioned checked on a 5 minute polling period. Media proxies are considered out of service when they fail to respond to messages sent from the GWC, and returned to service when the regular RSIP message is received by the GWC.

Alarms are raised as a media proxy goes out of service and cleared when it comes back in service. The customer should view the alarm as an indication that there is a problem with the media proxy. The new OM collected can be used to see how many media proxies are out of service and then use the customer logs to identify the media proxies that need attention.

An OM “Number of media proxies currently provisioned” is also implemented to complement this alarm - see the Performance Management section of this feature.

***Performance Management for A00007327*****3.1 Performance management strategy**

The **Media Proxy 5 and 30 minute** OMs feature provides operational measurements for calls involving media proxies and alarms for lost communication with media proxies.

**3.2 Performance management tools and utilities**

The scope of this feature in perspective to performance management is to provide a method of reporting information to the end-user; all tools and utilities for the analysis and handling procedures and controlled and maintained by the IEMS.

The Operational Measurements will be collected by IEMS polling covered in feature ACTID A00007388.

**3.3 Performance Measurements (PM), Operational Measurements (OM), and stats****3.3.1 Number of provisioned Media Proxies**

**Description:** The number of currently provisioned media proxies on the GWC.

**Behavior:** Simply counts the number of currently provisioned media proxies on the GWC each 5 minute period. This OM is intended to complement the Media Proxy Communications Failure alarm described in the Fault Management section of this feature.

### 3.3.2 Media Proxy 5 minute successful calls

**Description:** The number of calls that were successfully setup using this Media Proxy on this GWC in the last 5 minute OM period.

**Behavior:** Each time a successful call is setup involving a given Media Proxy, the specific count for that Media Proxy is incremented. At every 5 minute polling period, the count is reported and then reset to 0 to begin counting for the next period.

### 3.3.3 Media Proxy 30 minute successful calls

**Description:** The number of calls that were successfully setup using this Media Proxy on this GWC in the last 30 minute period.

**Behavior:** Same as 14.3.2 except reported/reset only every sixth 5 minute period (i.e. 30 minute period).

### 3.3.4 Media Proxy 5 minute failed calls

**Description:** The number of failed attempts to setup a call using this Media Proxy on this GWC in the last 5 minute OM period.

**Behavior:** Each time an attempt to setup a call on a given Media Proxy fails, the specific count for that Media Proxy is incremented. At every 5 minute polling period, the count is reported and then reset to 0 to begin counting for the next period.

### 3.3.5 Media Proxy 30 minute failed calls

**Description:** The number of failed attempts to setup a call using this Media Proxy on this GWC in the last 30 minute period.

**Behavior:** Same as 14.3.4 except reported/reset only every sixth 5 minute period (i.e. 30 minute period).

### 3.3.6 GWC 5 minute successful calls

**Description:** The number of calls that were successfully setup using any available Media Proxy on this GWC in the last 5 minute OM period.

**Behavior:** Each time a successful call is setup involving any Media Proxy, the count for the whole GWC incremented. At every 5 minute polling period, the count is reported and then reset to 0 to begin counting for the next period.

### 3.3.7 GWC 30 minute successful calls

**Description:** The number of calls that were successfully setup using any available Media Proxy on this GWC in the last 30 minute period.

**Behavior:** Same as 14.3.7 except reported/reset only every sixth 5 minute period (i.e. 30 minute period).

### 3.3.8 GWC 5 minute failed calls

**Description:** The number of failed attempts to setup a call on any available Media Proxy on this GWC in the last 5 minute OM period.

**Behavior:** Each time an attempt to setup a call involving any Media Proxy fails, the count for the whole GWC is incremented. A failure in this case is deemed to be a call where a media proxy is required and media proxy resources have been requested but subsequently ends for any reason before media proxy resources are successfully allocated.

At every 5 minute polling period, the count is reported and then reset to 0 to begin counting for the next period.

### 3.3.9 GWC 30 minute failed calls

**Description:** The number of failed attempts to setup a call on any available Media Proxy on this GWC in the last 30 minute period.

**Behavior:** Same as 14.3.8 except reported/reset only every sixth 5 minute period (i.e. 30 minute period).

### 3.3.10 Important Notes

If a call fails to setup on a media proxy attempted by the GWC, it may still succeed on another media proxy. In this case, a failure will still be logged against the failing media proxy, but the call itself will be counted as successful for the GWC.

If there are no media proxies in service when one is required, a fail will be counted against the whole GWC, but not against any individual media proxy.

For the above two reasons, the total number of failed calls for the GWC will not always be equal to the sum of failed calls on all its media proxies.

### 3.3.11 Limitations

If a media proxy is de-provisioned, its operational measurements for the current 5 minute and 30 minute periods are lost.



# SN08 Feature Deltas

## *Product = CS 2000 Management Tools*

### **A00006269--OSSGate Password No Echo**

#### *Functional Description*

#### **1.1 Feature name**

OSSGate Password No Echo - Actid A00006269

#### **1.2 Description**

This document details the OSSGate login changes. It describes the changes being made to OSSGate application which is part of CS2K Management Tools (CMT).

This feature is introduced to make OSSGate consistent with other user interfaces in the CS2K Configuration Management System.

This feature provides the following new or amended functionality:

- No echo of password to the screen when logging in to OSSGate using telnet client
- Ability to turn on or off this functionality using SESM configuration option
- Change to BPT tool to support either login modes

An important change to point out as a consequence of this feature is that OSS vendor software will be impacted by this change. In order to get existing OSS software to work when this new functionality is turned on by SESM configuration, there are couple of changes which need to be implemented in the OSS software. The following are the changes, only if OSSGate Password Control option is turned on (default: off).

- recognize the new login prompt. Prior to SN07 Verizon release, the user name and password was prompted in the same line separated by space. Now, the username and password are prompted one after the other
- OSSGate sends telnet protocol bytes to client to tell it to turn off echo and turn on echo. This is needed for telnet client software. OSS vendor software just needs to ignore these bytes.

### 1.3 Hardware Requirements or Dependencies

N/A

### 1.4 Software Requirements or Dependencies

N/A

### 1.5 Limitations and restrictions

N/A

### 1.6 Interactions

N/A

### 1.7 Applicable customer facing sections

Fault Management

Logs

\_\_\_\_\_

Alarms

\_\_\_\_\_

Configuration

Upgrade

\_\_\_X\_\_

Data Schema

\_\_\_\_\_

Service Order

\_\_\_\_\_

Element Management

\_\_\_\_\_

User Interface

\_\_\_X\_\_

Accounting (includes AMA billing)

\_\_\_\_\_

Performance (includes operational measurements)

\_\_\_\_\_

## 1.8 Glossary

| Acronym          | Definition                                               |
|------------------|----------------------------------------------------------|
| <b>BLM</b>       | Business Line Management                                 |
| <b>CLLI</b>      | Common Language Location Identifier                      |
| <b>CM</b>        | Computing Module                                         |
| <b>CMT</b>       | Call Server 2000 Management Tools                        |
| <b>CPE</b>       | Customer Premises Equipment                              |
| <b>CS</b>        | Call Server                                              |
| <b>CS2K</b>      | Call Server 2000                                         |
| <b>DDMS</b>      | DMS Data Management System                               |
| <b>DMS</b>       | Digital Multiplex System                                 |
| <b>GPS</b>       | Global Product Support                                   |
| <b>GUI</b>       | Graphical User Interface                                 |
| <b>HLD</b>       | High Level Design                                        |
| <b>HTML</b>      | HyperText Markup Language                                |
| <b>IP</b>        | Internet Protocol                                        |
| <b>ITA</b>       | Internet Transparency Agent                              |
| <b>LAN</b>       | Local Area Network                                       |
| <b>MI2</b>       | Manatee Iteration II                                     |
| <b>MTC</b>       | Maintenance                                              |
| <b>NA</b>        | North American                                           |
| <b>OAM&amp;P</b> | Operations, Administration, Maintenance and Provisioning |
| <b>OSS</b>       | Operation Support System                                 |
| <b>OSSDI</b>     | OSS Data Interface                                       |
| <b>PLM</b>       | Product Line Management                                  |
| <b>PTM</b>       | Packet Telephony Manager                                 |
| <b>SDM</b>       | SuperNode Data Manager                                   |

|              |                                                     |
|--------------|-----------------------------------------------------|
| <b>SESM</b>  | Succession Element and Sub-Element Manager [system] |
| <b>SSPFS</b> | Succession Solaris Platform Foundation Software     |
| <b>TCP</b>   | Transmission Control Protocol                       |
| <b>TDM</b>   | Time Division Multiplexing                          |

## ***Configuration for A00006269***

### **2.1 Upgrade Impact**

This activity is responsible for handling modifications to OSSGate login. By default the OSSGate login functionality will be same as in SN07 and to turn on the new functionality, the user has to manually turn on an option via SESM configuration.

Prior to the SN07 release, login to the OSSGate involved entering username and password in one line separated by space, and the password entered was visible on the telnet window. In SN08, the user has to manually configure to turn on the OSSGate Password Control option in the SESM's OSSGate configuration section. Once this option is turned on, when attempting to login to OSSGate, it will prompt for the username first and then the password and the password being entered will not be displayed to the screen.

The default value of this OSSGate Password Control option is off, meaning the OSSGate login will be similar to SN07. This is done to minimize the impact to OSS operations, since the new login prompts of OSSGate will require changes in OSS vendor software. With this approach, it gives the customer the flexibility to turn on OSSGate password control option, when they are ready with changes to OSS vendor software. There is no impact after upgrades other than this OSSGate Password Control option is now available in SESM's OSSGate configuration section and the user can turn it on (default is off)

### **2.2 Data schema (DS) (CM, MIBS, RDB)**

N/A

### **2.3 Service Orders (SO) (CM & SESM)**

N/A

### **2.4 Element Management**

N/A



## 2.5 User Interface

### 2.5.1 OSSGate Login prompt changes

This section shows the new login prompt prompted by OSSGate. The other functionality of OSSGate does not change except for the login prompt changes.

The user has to manually turn on the OSSGate Password Control option in order for this login change to take affect, as it is turned off by default.

Shown below is the screen capture of logging into OSSGate from SESM box. (user input is shown in blue). The new login prompts are shown in red.

```
#telnet localhost 10023
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^'.
```

```
Enter User Name
> ptm
```

```
Enter Password
>
ptm logged in on 04/04/16 at 09:02:40.
```

```
*****
**                                     **
**          OSS Gateway                **
**                                     **
**   This is a PRIVATE Database.        **
**                                     **
**   All activity is subject to monitoring.  **
**                                     **
**   Any UNAUTHORIZED access or use is PROHIBITED  **
**   and may result in PROSECUTION.        **
**                                     **
*****
** WARNING: Different service types require  **
** different formats. Consult the OSSGate User's  **
** Guide, NE1004-512, for detailed information  **
** regarding command formats and usage rules.  **
** Failure to do so can cause a mismatch between  **
** XACore and SESM data.                    **
*****
```

SN07 Build: Apr 13, 2004 7:28:37 PM

\*\*\*\*\*

>

## 2.5.2 OSSGate configuration

In this section, the screen output below shows the new OSSGate Password Control option which needs to be turned on to enable OSSGate to not echo password to the screen. The new configuration option is available in SESM's OSSGate configuration section and is shown in red. The user input is shown in blue.

After logging into the SESM box as root,

```
#cd /opt/nortel/NTsesm/admin/bin
```

```
#./configure
```

SESM configuration

- 1 - SESM common configuration (IP addresses, Market, CM CLI)
- 2 - SESM database tools
- 3 - SESM related applications configuration (MG9K, LMM, CICM)
- 4 - SESM provisioning configuration
- 5 - SESM logging configuration (syslog, sesm debug log)
- 6 - view sesm configuration settings
- 7 - SESM refresh properties

X - exit

select - 4

SESM Provisioning Configuration

- 1 - XML Trunk Provisioning configuration
- 2 - OSSGate Provisioning configuration
- 3 - Office Provisioning Type configuration

X - exit

select - 2

### SESM OSSGate Provisioning Configuration

Enter the Primary Port OSSGate will use for telnet connections (default: 10023):  
Enter the Secondary Port OSSGate will use for telnet connections (default: 11023):

Enter the OSSGate Timeout period, in seconds (default: 600):  
Do you wish to have OSSGate Port Forwarding on for SSH [y/n]: n

Do you wish to turn on/off OSSGate Password Control option  
( when this option is turned on, OSSGate will not echo  
password on screen when logging onto it) [default:off] : on

Updating the property files with changed values, please wait...

Reloading the changed property values into memory, please wait...

### 2.5.3 Login prompt change implications

Prior to the SN08, the user name and password was prompted in the same line. In this release however, there are two main changes which impact clients of OSSGate. They are

1. Instead of looking for login prompt “Enter username and password”, clients should look for “Enter User Name” prompt from OSSGate first. Once it gets this, the user name should be sent to OSSGate. Ossgate will then send “Enter Password” prompt. After receiving this prompt, the password should be sent to OSSGate.
2. OSSGate sends telnet echo off byte sequence to clients (to tell telnet clients to not display password entered onto screen) after sending the “Enter Password” prompt. This echo off byte sequence is necessary to make telnet client software not echo password typed on screen.

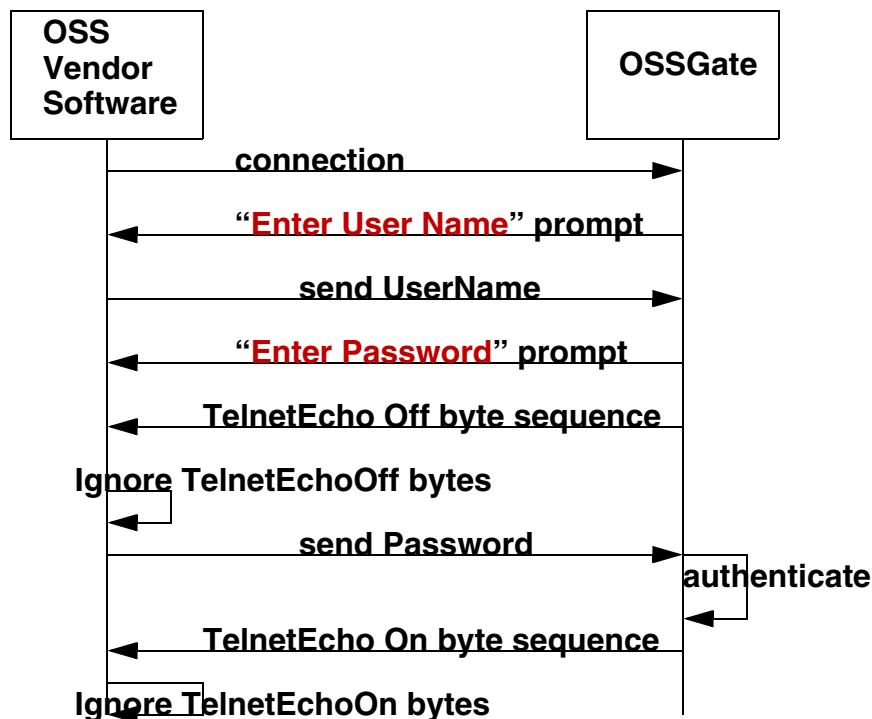
#### 2.5.3.1 Impact to BPT tool

There are no external interface changes to BPT. Internally, BPT tool will handle the different prompts and will also strip telnet bytes and ignore them. But for users of BPT tool, there are no changes in the interface.

#### 2.5.3.2 Impact to OSS vendor software

OSS software should be able to handle the new login prompts and also detect telnet bytes and strip these bytes and ignore them.

Shown in the Figure 1 below are the changes need to be done to OSS vendor software to interact with OSSGate when the OSSGate password control option is enabled.

**Figure 2** OSS Vendor software and its interaction with OSSGate

In the above figure, the new prompts are shown in dark red. The telnet bytes sent are explained below.

The Telnet Echo Off byte sequence are 3 bytes shown below

#### IAC WILL ECHO

IAC byte value is 255  
 WILL byte value is 251  
 ECHO byte value is 1

OSS software should look for these bytes and when received, just ignore them

The Telnet Echo On byte sequence are 3 bytes shown below

#### IAC WONT ECHO

IAC byte value is 255  
 WONT byte value is 252  
 ECHO byte value is 1

## ***Product = CS 2000 Management Tools***

### **A00006570--CS2M Robustness enhancement - Moving SDM IP & CLLI input to SSPFS**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

#### **1.2 Description**

##### **1.2.1 Existing Functionality**

Prior to SN08, SDM IP/CLLI/CM IP are configured both in SSPFS, CS2M and NPM.

**Table 1 SDM IP / CLLI / CM IP Configuration areas in CS2M/NPM (SN07)**

| <b>Property</b> | <b>Component</b> | <b>Required</b>            | <b>Command</b> | <b>Save in</b>  |
|-----------------|------------------|----------------------------|----------------|-----------------|
| SDM_IP          | SESM             | Required                   | configure      | sesm.properties |
| SDM_IP          | SAM21 EM         | Required                   | cli (SSPFS)    | /etc/profile    |
| SDM_IP          | NPM              | N/A                        | N/A            | N/A             |
| CM_CLLI         | SESM             | Required                   | configure      | sesm.properties |
| CM_CLLI         | SAM21 EM         | Optional (For GUI display) | cli (SSPFS)    | /etc/profile    |
| CM_CLLI         | NPM              | Required for PFRS          | cli (SSPFS)    | NPM Database    |
| CM_IP           | SESM             | N/A                        | N/A            | N/A             |
| CM_IP           | SAM21 EM         | N/A                        | N/A            | N/A             |
| CM_IP           | NPM              | N/A                        | N/A            | N/A             |

In SN07, For SESM application, the SDM IP and CLLI configuration are required for the communication between SESM and SDM/CBM/Core. User should run the command “**configure**” to set the SDM IP and CM CLLI to file **sesm.properties**.

In SN07, for SAM21 EM application, the SDM IP configuration by cli tool is required for the SAM21 EM server. The CM CLLI configuration is the optional one for displaying on the GUI of SAM21 EM. The SDM IP and CM CLLI configuration could be finished by **cli** tool.

In SN07, For NPM application, the step of configure CLLI is required for PFRS enable. The CLLI value is stored in the NPM database. User should run the command “**pfrsCli**” to enable the PFRS service as well as configure the CM CLLI to NPM database.

## 1.2.2 Feature Functionality

In the SN08 release, the robustness enhancement is implemented to improve the SDM IP/CM CLLI configuration and reusing for CS2M/IEMS server. This feature seeks to stop user to input CM CLLI manually and retrieve it by SDM IP automatically.

The SDM IP / CM CLLI will be set to /etc/profile as system environment variables during SSPFS installation process or by cli tool after SSPFS installation for each application reading and using. Each application will stop to reserve the entry for these two parameters.

### 1.2.2.1 SSPFS installation

In SN08, SSPFS will be changed to prompt the user to enter the SDM IP during SSPFS installation. CM CLLI is retrieved automatically from Core by SDM IP.

Whenever CLLI is retrieved successfully, SDM IP and CLLI will be set in the system environment file /etc/profile, which is easy access and read.

### 1.2.2.2 SSPFS cli tool

In cli tool, the command “sdm\_conf” adds the function of SDM IP validation and CM CLLI retrieving automatically by SDM IP.

### 1.2.2.3 SESM configuration & starting up

#### 1. Configuration

In SN08, SDM IP and CLLI duplicate configuration in SSPFS and SESM will be eliminated.

The SESM script *configure* is changed to stop to require for user to input SDM IP and CLLI manually. It will reuse the SDM IP and CM CLLI which are set as system environment variables in SSPFS level.

#### 2. Starting up

SESM startup script will add a process to check whether SDM IP and CLLI are configured or not. If not, the SESM start up script will prompt user to configure the SDM IP & CM CLLI by *cli tool*. The start up process will fail.

### 1.2.2.4 SESM applications

SDM IP/CLLI related parameters are not provided in file sesm.properties any more. All related applications which retrieve these parameters transfer to retrieve them from system wide environment variables (in /etc/profile).

Parameters removed from sesm.properties/PTM.properties:

- ptm.base.cmcli=CMCLLI
- lmm.cmcli=CLLI
- ptm.cmcli.<CMCLLI>=<SDMIP>

Parameters removed from NetworkView.properties

- nv.callserver.name

#### 1.2.2.5 SAM21 EM starting up

When SAM21 EM is starting up, in the case of SDM IP is configured but the CLI is NOT configured, it will retrieve CLI automatically by SDM IP and set it to /etc/profile. The starting up process will continue.

#### 1.2.2.6 NPM configuration & starting up

In SN08, NPM will reuse the common configuration of CLI in file /etc/profile. It will stop user to input it manually when enabling PFRS.

#### 1.2.2.7 CS2M Installation and Configuration

In SN08, User should not have to know to go run X configure steps to complete CS2M installation. The system should walk them through it, perhaps with the option of bypassing it to be done manually later.

#### 1.2.2.8 Upgrading

The SSPFS upgrade & CS2M upgrade should transfer the CM\_CLI and SDM IP settings from sesm.properties to /etc/profile smoothly.

### 1.3 Hardware Requirements or Dependencies

No new hardware or hardware dependencies are introduced.

### 1.4 Software Requirements or Dependencies

No new customer software or firmware dependencies are introduced in this feature.

### 1.5 Limitations and restrictions

No limitations or restrictions that is visible to any user are planned as part of this feature.

### 1.6 Interactions

No interactions between this feature and existing features.

### 1.7 Glossary

| Term     | Explanation                            |
|----------|----------------------------------------|
| CS2M     | CS2000 Management Components           |
| SESM     | Succession Element Sub-element Manager |
| SAM21 EM | CS2000 SAM21 Manager                   |
| NPM      | Network Patch Manager                  |

|       |                                                                                                                |
|-------|----------------------------------------------------------------------------------------------------------------|
| SSPFS | Succession Server Platform Foundation Software                                                                 |
| CLLI  | The coding system used to identify Central Offices uniquely, entered as a string not longer than 16 characters |
| SDM   | SuperNode Data Manager                                                                                         |

## *Configuration for A00006570*

### **1.8 Hardware and Software Requirements**

None.

### **1.9 Initial Configuration**

None.

### **1.10 Office/Subnet parameters (OP/SP) (CM & SESM)**

None.

### **1.11 Upgrade Considerations**

None.

### **1.12 Data schema (DS) (CM, MIBS, RDB)**

#### **1.12.1 New/modified tables, MIBs, or Database Schema**

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------|--------------------------|------------------------------------|
| pfrsScheduler  | CHANGED                  | UnChanged                          |

#### **1.12.2 Table/MIB/Remote Database Schema information**

##### **1.12.2.1 NPM table: pfrsScheduler**

##### **1.12.2.1.1 Fields/OIDs**



The following table lists fields/OIDs for pfrsScheduler.

**Table 2 Table field descriptions**

| Field | New or Changed | Subfield or refinement | Entry       | Explanation and action                                                                   |
|-------|----------------|------------------------|-------------|------------------------------------------------------------------------------------------|
| cli   | Removed        |                        | VARCHAR(20) | Field <b>cli</b> is removed from this table. NPM transfers to use CM CLI in /etc/profile |

#### 1.12.2.1.2 Table release history update

— Field “cli” removed from table pfrsScheduler

#### 1.12.2.1.3 Supplementary information

None

#### 1.12.2.1.4 Translation verification and other tools

pfrsScheduler does not use translation verification tools.

### 1.13 Service Orders (SO) (CM & SESM)

None.

#### 1.13.1 Element ManagementNew/modified GUIs

**Table 3 New or modified GUIs**

| GUI name | NEW, CHANGED, or DELETED |
|----------|--------------------------|
| LMM      | Changed                  |

#### 1.13.2 GUI information

##### 1.13.2.1 GUI name: LMM

Line Maintenance Manager Graphical User Interface

##### 1.13.2.1.1 Functional description

The LMM will be changed to let user input SDM IP instead of CM CLI to transfer to another core server.

##### 1.13.2.1.2 GUI usage and implications

Current datafill order unchanged.

### 1.13.2.1.3 GUI size

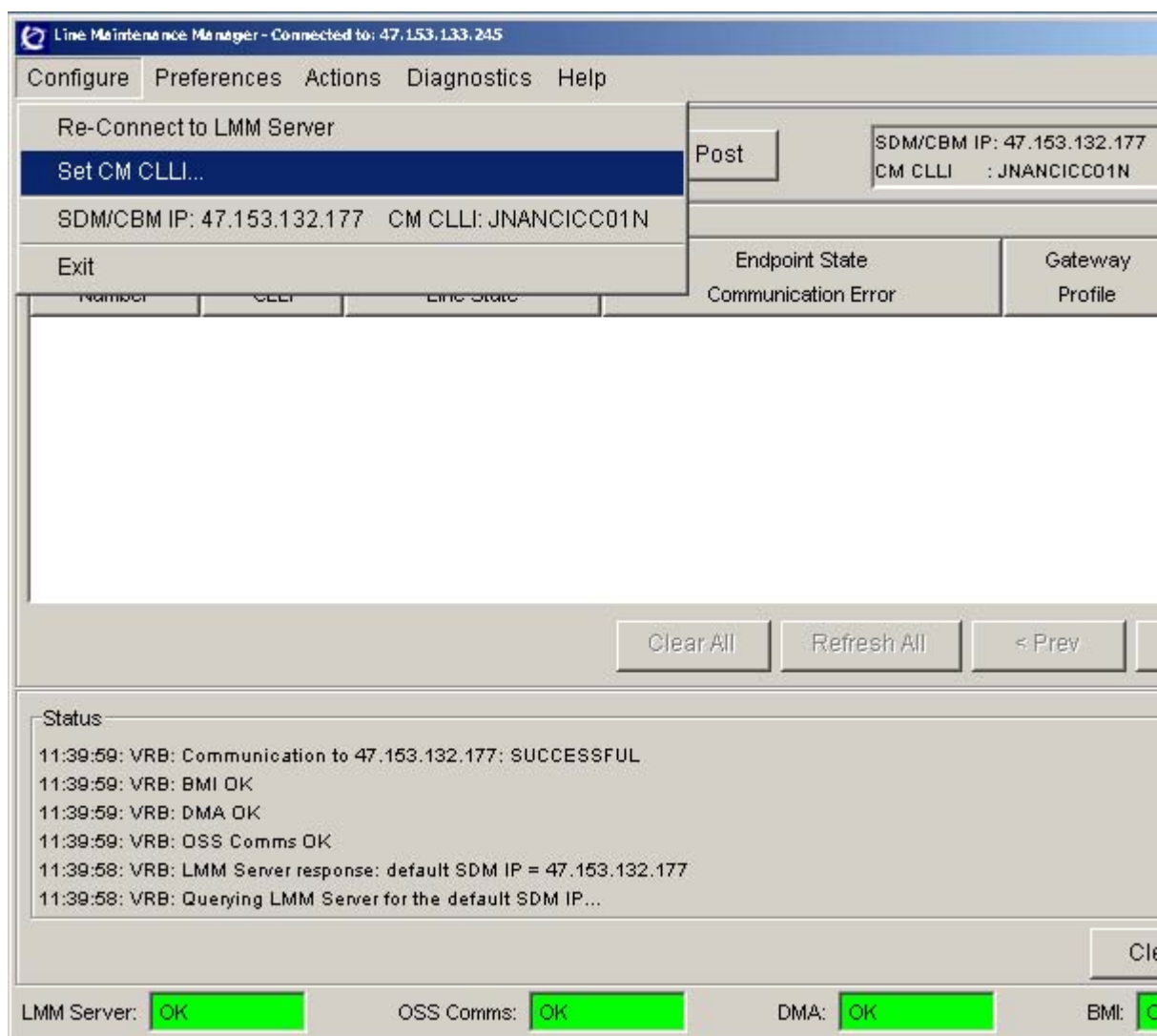
Table 4 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| LMM                  | Unchanged         | Unchanged         | Unchanged             |
| CS2M                 | Unchanged         | Unchanged         | Unchanged             |

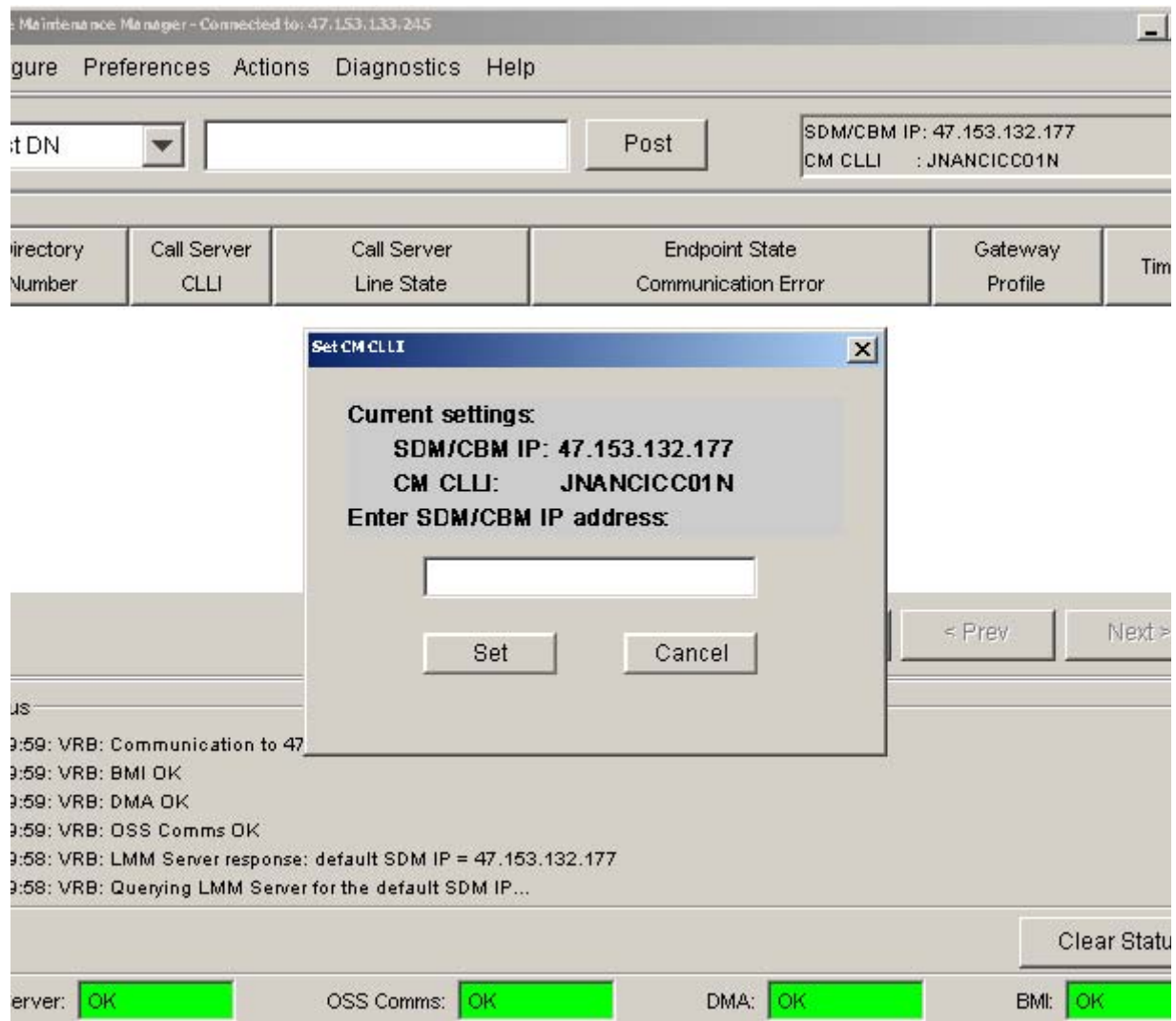
### 1.13.2.1.4 Usage example: Set New CS CLI

The following example shows sample datafill or menu selection for GUI LMM:

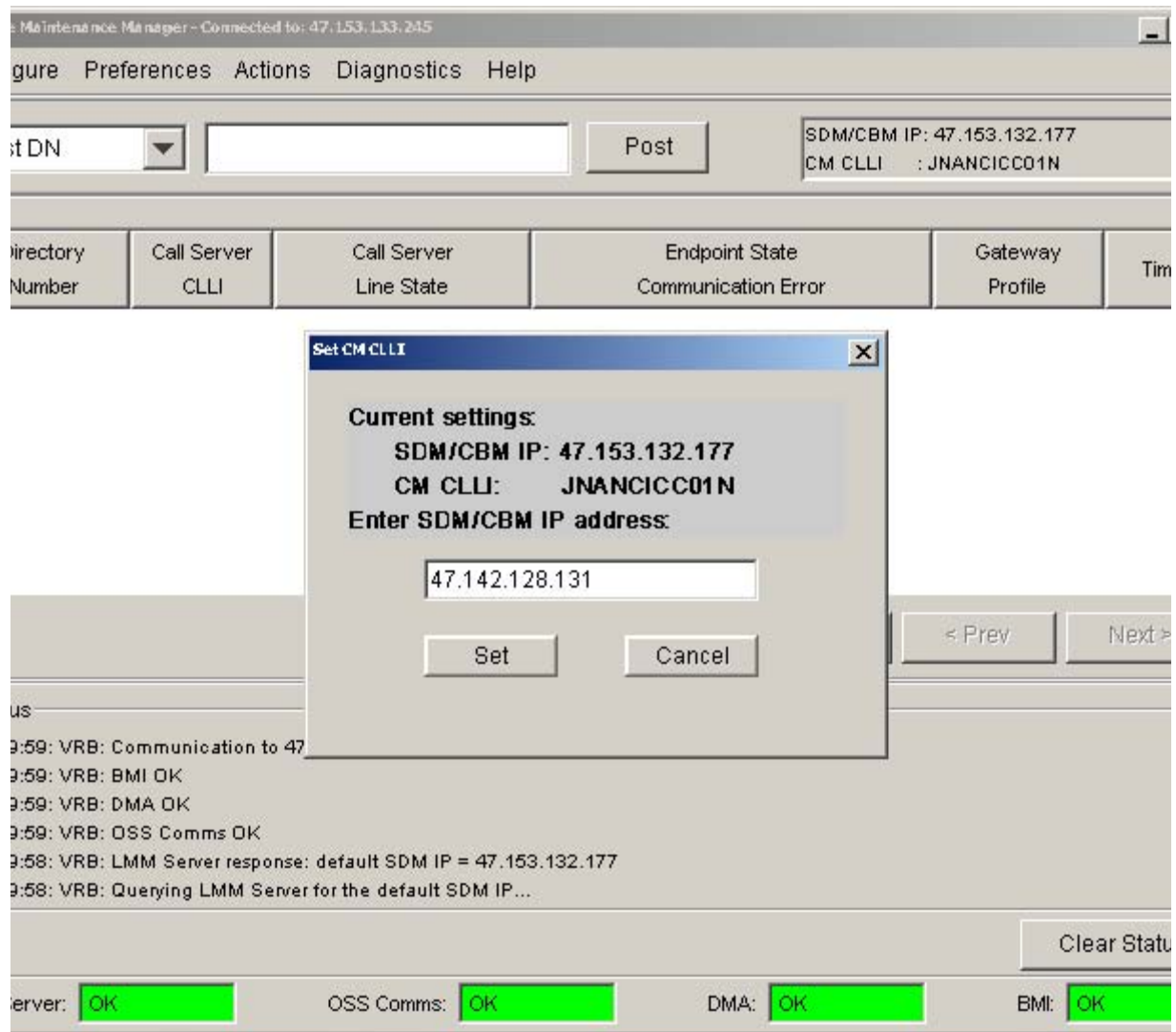
Select “Set CS CLI...” from LMM menu:



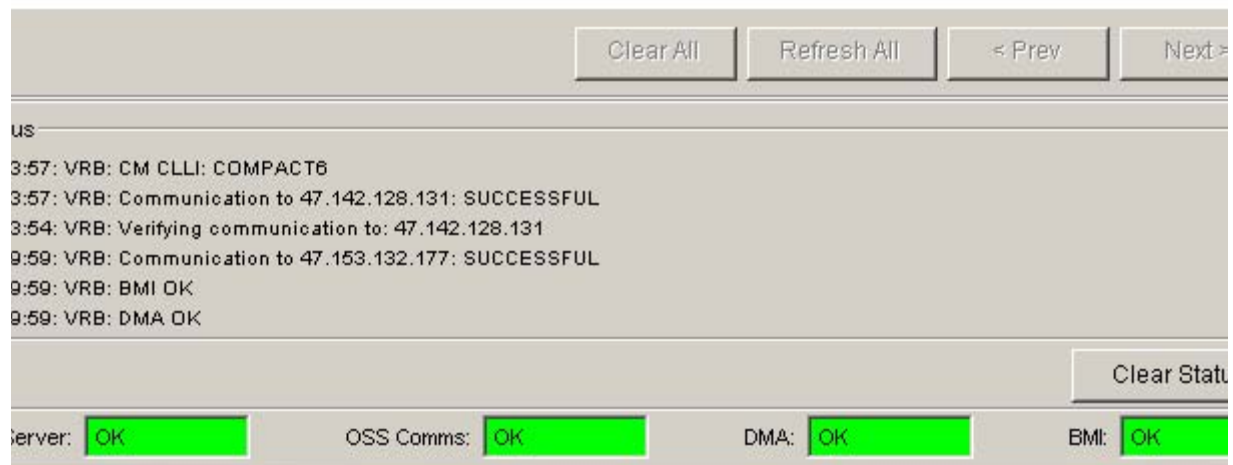
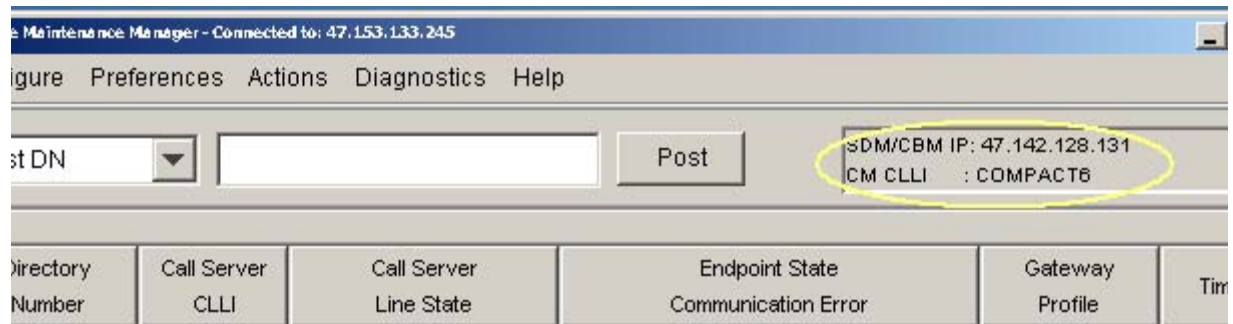
A dialog pops up to let user input SDM IP:



Input the SDM IP:



SDM IP is verified and the CM CLI is retrieved and set on client GUI.



#### 1.13.2.1.5 GUI release history update

The following information was changed:

For the menu of “Set CS CLLI“, it pops up a dialog to prompt user inputting SDM IP instead of CM CLLI.

#### 1.13.2.1.6 Context sensitive launching information

None.

#### 1.13.2.1.7 Supplementary information

None.

### 1.13.2.2 GUI name: TMM

Trunk Maintenance Manager Graphical User Interface

#### 1.13.2.2.1 Functional description

The TMM will be changed to let user input SDM IP instead of CM CLI to transfer to another core server.

#### 1.13.2.2.2 GUI usage and implications

Current datafill order unchanged.

#### 1.13.2.2.3 GUI size

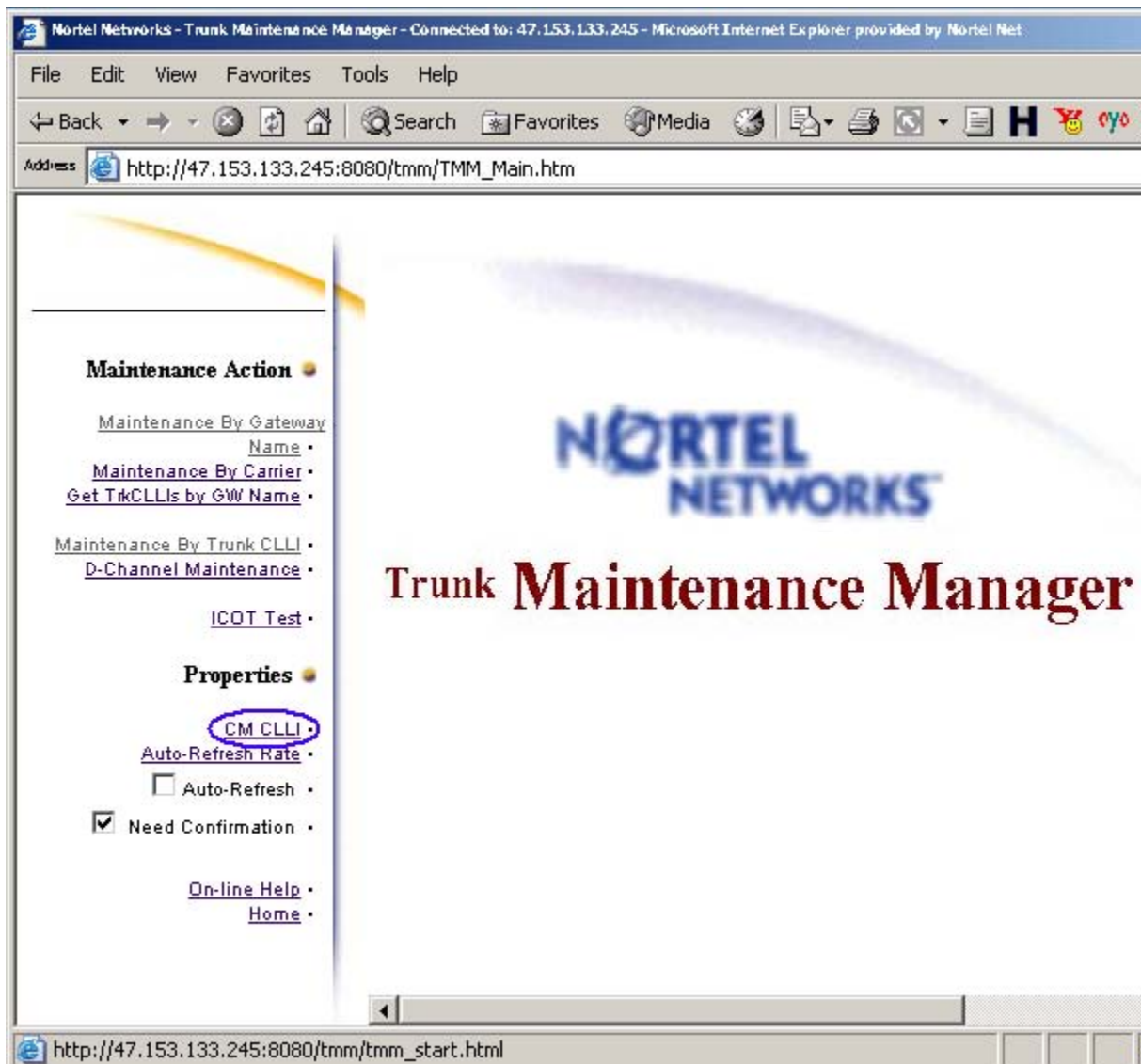
Table 5 New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| TMM                  | Unchanged         | Unchanged         | Unchanged             |
| CS2M                 | Unchanged         | Unchanged         | Unchanged             |

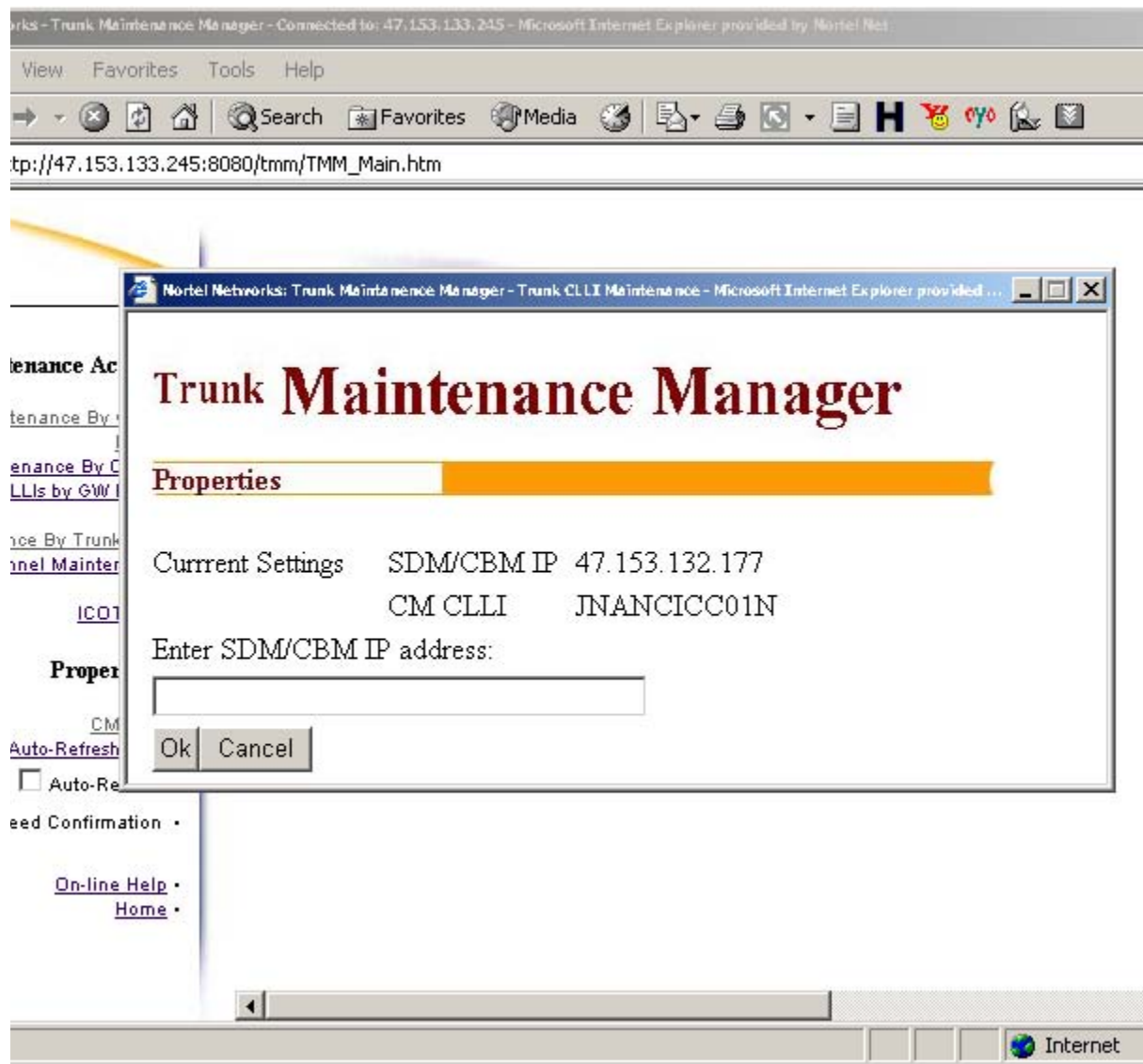
#### 1.13.2.2.4 Usage example: Set New CM CLI

The following example shows sample datafill or menu selection for GUI TMM:

Click the “CM CLI” from left menu:

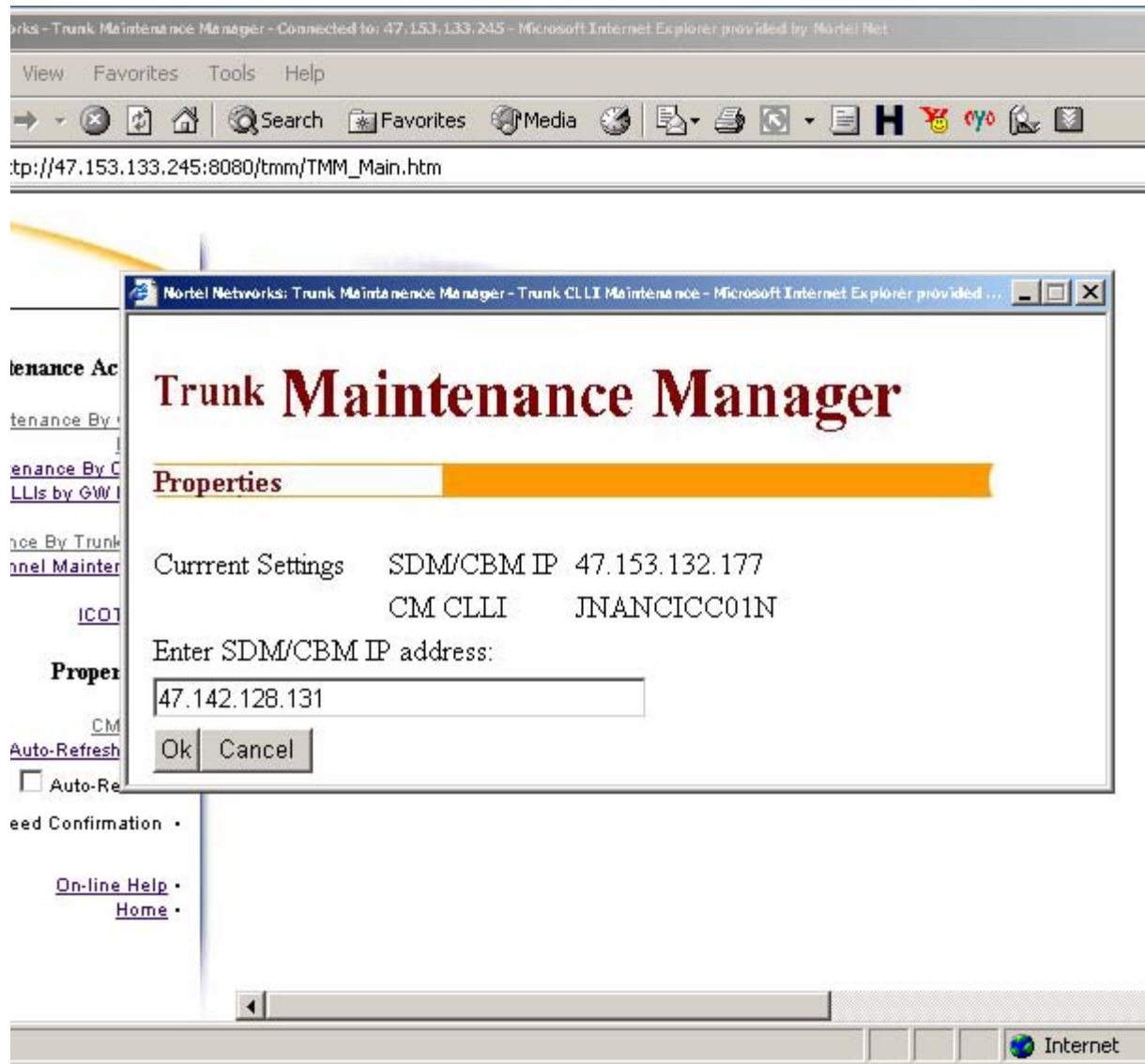


A dialog pops up to show the current settings. A input box which let user input SDM IP:

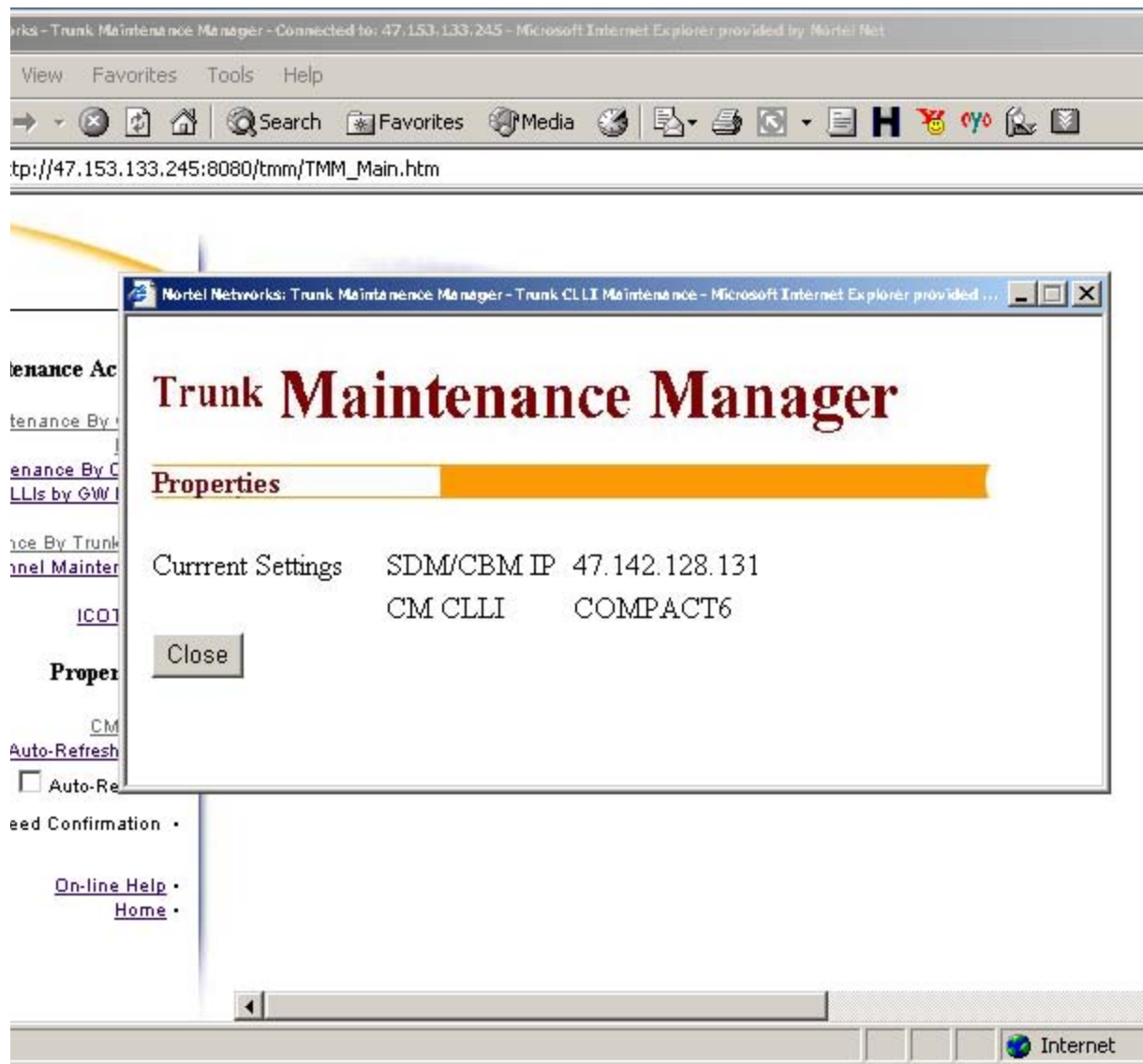


Input the SDM IP:





SDM IP is verified and the CM CLI is retrieved and set on client GUI.



#### 1.13.2.2.5 GUI release history update

The following information was changed:

For the menu of “CM CLI”, it pops up a dialog to prompt user inputting SDM IP instead of CM CLI.

#### 1.13.2.2.6 Context sensitive launching information

None.

#### 1.13.2.2.7 Supplementary information

None.

## 1.14 User interface changes

### 1.14.1 SSPFS Installation Changes:

A step of SDM IP configuration is added to SSPFS installation for cs2kmt, cs2kaps, iemscs2k packages.

In this section, the screen output below shows the new step added in SSPFS installation process. The new step is shown in **blue**. The user input is shown in **red**.

Adding NTci (cs2kmt Profile Software Package 18 of 18)

Unzipping NTci From the Cdrom

.

Installing NTci Package

..

Done Installing NTci Package...

Executing server profile specific commands

Will the SDM IP be specific now? (y/n) **y**

Enter the ip address of the SDM [] **47.142.128.131**

Retrieving CM CLLI. Please wait a minute.....

SDM IP: 47.142.128.16

CM CLLI: COMPACT6

Enter "ok" to accept current settings **ok**

Please perform a logout and login so your  
shell will pick up the SDM environment settings

SDM IP and CM CLLI is Successfully Configured

Unzipping DCE From The Cdrom

.....

### 1.14.2 SSPFS cli Tool Changes

SSPFS cli tool has some changes as below:

1. For cs2kmt, cs2kaps, iemscs2k packages, retrieve the CM CLLI while user configures the SDM IP in menu sdm\_conf
2. Split the SDM IP configure and SDM User configure into two separate menus.
3. Binding the ddmsproxy to cli tool

In this section, the screen output below shows the cli tool changes in SSPFS. The new step is shown in blue. The modified menu is shown in magenta. The user input is shown in red.

### 1.14.2.1 sdm\_conf

# cli

Command Line Interface

- 1 - View
- 2 - Configuration
- 3 - Other

X - exit

select - 2

Configuration

- 1 - NTP Configuration
- 2 - Apache Proxy Configuration
- 3 - DCE Configuration
- 4 - OAMP Application Configuration
- 5 - CORBA Configuration
- 6 - IP Configuration
- 7 - DNS Configuration
- 8 - Syslog Configuration
- 9 - Database Configuration
- 10 - NFS Configuration
- 11 - Bootp Configuration
- 12 - Restricted Shell Configuration
- 13 - Security Services Configuration
- 14 - Login Session
- 15 - Location Configuration
- 16 - Cluster Configuration
- 17 - Succession Element Configuration
- 18 - snmp\_poller (SNMP Poller Configuration)

X - exit

select - 4

OAMP Application Configuration

- 1 - sdm\_conf (Configure SDM IP Address)
- 2 - sdm\_unconf (Unconfigure SDM IP Address)
- 3 - sdmuser\_conf (Configure SDM User)
- 4 - sdmuser\_unconf (Unconfigure SDM User)

- 5 - cmClli\_rediscovery (Re-discovery the CM CLLI by SDM IP )
- 6 - cmClli\_conf (Configure CM\_CLLI Address)
- 7 - cmClli\_unconf (Unconfigure CM\_CLLI IP Address)
- 8 - cm\_conf (Configure CM IP Address)
- 9 - cm\_unconf (Unconfigure CM IP Address)

X - exit

select - 1

=== Executing "sdm\_conf"

Enter the ip address of the SDM [] 47.142.92.26

Retrieving CM CLLI. Please wait a minute.....

SDM IP: 47.142.128.16  
CM CLLI: COMPACT6

Enter "ok" to accept current settings ok

Please perform a logout and login so your  
shell will pick up the SDM environment settings

SDM IP and CM CLLI is Successfully Configured

OAMP Application Configuration

- 1 - sdm\_conf (Configure SDM IP Address)
- 2 - sdm\_unconf (Unconfigure SDM IP Address)
- 3 - sdmuser\_conf (Configure SDM User)
- 4 - sdmuser\_unconf (Unconfigure SDM User)
- 5 - cmClli\_rediscovery (Re-discovery the CM CLLI by SDM IP )
- 6 - cmClli\_conf (Configure CM\_CLLI Address)
- 7 - cmClli\_unconf (Unconfigure CM\_CLLI IP Address)
- 8 - cm\_conf (Configure CM IP Address)
- 9 - cm\_unconf (Unconfigure CM IP Address)

X - exit

select - x

### 1.14.2.2 sdmuser\_conf

# cli

Command Line Interface

- 1 - View
- 2 - Configuration

3 - Other

X - exit

select - 2

Configuration

- 1 - NTP Configuration
- 2 - Apache Proxy Configuration
- 3 - DCE Configuration
- 4 - OAMP Application Configuration
- 5 - CORBA Configuration
- 6 - IP Configuration
- 7 - DNS Configuration
- 8 - Syslog Configuration
- 9 - Database Configuration
- 10 - NFS Configuration
- 11 - Bootp Configuration
- 12 - Restricted Shell Configuration
- 13 - Security Services Configuration
- 14 - Login Session
- 15 - Location Configuration
- 16 - Cluster Configuration
- 17 - Succession Element Configuration
- 18 - snmp\_poller (SNMP Poller Configuration)

X - exit

select - 4

OAMP Application Configuration

- 1 - sdm\_conf (Configure SDM IP Address)
- 2 - sdm\_unconf (Unconfigure SDM IP Address)
- 3 - sdmuser\_conf (Configure SDM User)
- 4 - sdmuser\_unconf (Unconfigure SDM User)
- 5 - cmClli\_rediscovery (Re-discovery the CM CLLI by SDM IP )
- 6 - cmClli\_conf (Configure CM\_CLLI Address)
- 7 - cmClli\_unconf (Unconfigure CM\_CLLI IP Address)
- 8 - cm\_conf (Configure CM IP Address)
- 9 - cm\_unconf (Unconfigure CM IP Address)

X - exit

select - 3

=== Executing "sdmuser\_conf"

Enter the SDM user name for file management []swld

SDM User Name swld

Enter "ok" to accept current settings ok

Please ensure that you follow the SSPFS instructions  
on setting up the SSH keys for SDM-SSPFS communications

In addition, please perform a logout and login so your  
shell will pick up the SDM environment settings

SDM User Successfully Configured

=== "sdmuser\_conf" completed successfully

OAMP Application Configuration

- 1 - sdm\_conf (Configure SDM IP Address)
- 2 - sdm\_unconf (Unconfigure SDM IP Address)
- 3 - sdmuser\_conf (Configure SDM User)
- 4 - sdmuser\_unconf (Unconfigure SDM User)
- 5 - cmClli\_rediscovery (Re-discovery the CM CLLI by SDM IP )
- 6 - cmClli\_conf (Configure CM\_CLLI Address)
- 7 - cmClli\_unconf (Unconfigure CM\_CLLI IP Address)
- 8 - cm\_conf (Configure CM IP Address)
- 9 - cm\_unconf (Unconfigure CM IP Address)

X - exit

select - x

### 1.14.2.3 cmClli\_rediscovery

# cli

Command Line Interface

- 1 - View
- 2 - Configuration
- 3 - Other

X - exit

select - 2

Configuration

- 1 - NTP Configuration
- 2 - Apache Proxy Configuration
- 3 - DCE Configuration

- 4 - OAMP Application Configuration
- 5 - CORBA Configuration
- 6 - IP Configuration
- 7 - DNS Configuration
- 8 - Syslog Configuration
- 9 - Database Configuration
- 10 - NFS Configuration
- 11 - Bootp Configuration
- 12 - Restricted Shell Configuration
- 13 - Security Services Configuration
- 14 - Login Session
- 15 - Location Configuration
- 16 - Cluster Configuration
- 17 - Succession Element Configuration
- 18 - snmp\_poller (SNMP Poller Configuration)

X - exit

select - 4

#### OAMP Application Configuration

- 1 - sdm\_conf (Configure SDM IP Address)
- 2 - sdm\_unconf (Unconfigure SDM IP Address)
- 3 - sdmuser\_conf (Configure SDM User)
- 4 - sdmuser\_unconf (Unconfigure SDM User)
- 5 - cmClli\_rediscovery (Re-discovery the CM CLLI by SDM IP )
- 6 - cmClli\_conf (Configure CM\_CLLI Address)
- 7 - cmClli\_unconf (Unconfigure CM\_CLLI IP Address)
- 8 - cm\_conf (Configure CM IP Address)
- 9 - cm\_unconf (Unconfigure CM IP Address)

X - exit

select - 5

=== Executing "cmClli\_rediscovery "

Retrieve CM CLLI by SDM IP 47.142.92.26. Please wait a minute.....

CM CLLI old value : COMPACT5

CM CLLI new value: COMPACT5

CM CLLI does not changed. Please press any key to exit. <Enter>

=== "cmClli\_rediscovery " completed successfully



## OAMP Application Configuration

- 1 - sdm\_conf (Configure SDM IP Address)
- 2 - sdm\_unconf (Unconfigure SDM IP Address)
- 3 - sdmuser\_conf (Configure SDM User)
- 4 - sdmuser\_unconf (Unconfigure SDM User)
- 5 - cmClli\_rediscovery (Re-discovery the CM CLLI by SDM IP )
- 6 - cmClli\_conf (Configure CM\_CLLI Address)
- 7 - cmClli\_unconf (Unconfigure CM\_CLLI IP Address)
- 8 - cm\_conf (Configure CM IP Address)
- 9 - cm\_unconf (Unconfigure CM IP Address)

X - exit

select - x

### 1.14.2.4 ddmsproxy menus:

# cli

#### Command Line Interface

- 1 - View
- 2 - Configuration
- 3 - Other

X - exit

select - 2

#### Configuration

- 1 - NTP Configuration
- 2 - Apache Proxy Configuration
- 3 - DCE Configuration
- 4 - OAMP Application Configuration
- 5 - CORBA Configuration
- 6 - IP Configuration
- 7 - DNS Configuration
- 8 - Syslog Configuration
- 9 - Database Configuration
- 10 - NFS Configuration
- 11 - Bootp Configuration
- 12 - Restricted Shell Configuration
- 13 - Security Services Configuration
- 14 - Login Session
- 15 - Location Configuration
- 16 - Cluster Configuration
- 17 - Succession Element Configuration
- 18 - snmp\_poller (SNMP Poller Configuration)

X - exit

select - 17

## Succession Element Configuration

### 1 - DDMSProxy Application Configuration

X - exit

select - 1

## DDMSProxy Application Configuration

1 - ddmsproxy\_query (Query the status of ddmsproxy service)

2 - ddmsproxy\_stop (Stop the ddmsproxy service)

3 - ddmsproxy\_start (Start up the ddmsproxy service)

X - exit

select - 1

=== Executing "ddmsproxy\_query"

```
pmfadm -c ddmsproxyd -n 5 -t 60 /opt/nortel/ddmsproxy/bin/ddmsproxy.sh
    retries: 0
    owner: root
    pids: 9178 9180 9181
```

=== "ddmsproxy\_query" completed successfully

## DDMSProxy Application Configuration

1 - ddmsproxy\_query (Query the status of ddmsproxy service)

2 - ddmsproxy\_stop (Stop the ddmsproxy service)

3 - ddmsproxy\_start (Start up the ddmsproxy service)

X - exit

select - 2

=== Executing "ddmsproxy\_stop"

ddmsproxy service stopping

=== "ddmsproxy\_stop" completed successfully

## DDMSProxy Application Configuration

1 - ddmsproxy\_query (Query the status of ddmsproxy service)

- 2 - ddmsproxy\_stop (Stop the ddmsproxy service)
- 3 - ddmsproxy\_start (Start up the ddmsproxy service)

X - exit

select - 3  
=== Executing "ddmsproxy\_start"

ddmsproxy service starting

=== "ddmsproxy\_start" completed successfully

DDMSProxy Application Configuration

- 1 - ddmsproxy\_query (Query the status of ddmsproxy service)
- 2 - ddmsproxy\_stop (Stop the ddmsproxy service)
- 3 - ddmsproxy\_start (Start up the ddmsproxy service)

X - exit

select - x

### 1.14.3 SESM configure command changes

SESM command “configure” is changed to stop requiring user input SDM IP and CM CLI. It reuses the SDM IP and CM CLI from /etc/profile

# configure

SESM configuration

- 1 - SESM common configuration (IP addresses, Market, CM CLI)
- 2 - SESM database tools
- 3 - SESM related applications configuration (MG9K, LMM, CICM)
- 4 - SESM provisioning configuration
- 5 - SESM logging configuration (syslog, sesm debug log)
- 6 - view sesm configuration settings
- 7 - SESM refresh properties

X - exit

select - 1

SESM common configuration

SDM IP : 47.142.128.16  
CM CLI : COMPACT5

Enter IP address of this machine (default: 47.153.133.245 ): <Enter>

## SESM Market Selection

- 1 - International
- 2 - North American

Enter Market the SESM is to configured for: **2**

No mirroring performed as it is not necessary when NPM is on the local machine or cluster.

Setting address 47.153.146.200 in www/tmm.html

Setting address 47.153.146.200 in www/sesm.jnlp.template

Setting address 47.153.146.200 in www/lmm.jnlp.template

Setting address 47.153.146.200 in www/loginDialog.jnlp.template

Setting address 47.153.146.200 in www/config.js

Setting address 47.153.146.200 in settings

Setting communication host 47.153.146.200 in www/sesm.jnlp.template

Setting communication host 47.153.146.200 in www/lmm.jnlp.template

Setting communication host 47.153.146.200 in www/loginDialog.jnlp.template

Setting communication host 47.153.146.200 in www/config.js

Setting communication protocol http in www/sesm.jnlp.template

Setting communication protocol http in www/lmm.jnlp.template

Setting communication protocol http in www/loginDialog.jnlp.template

Setting communication protocol http in www/config.js

Setting communication port 8080 in www/sesm.jnlp.template

Setting communication port 8080 in www/lmm.jnlp.template

Setting communication port 8080 in www/loginDialog.jnlp.template

Setting communication port 8080 in www/config.js

Setting CM Host Name COMPACT5 in nv.sql

Setting CM Host Name COMPACT5 in nv\_data.sql

## SESM configuration

- 1 - SESM common configuration (IP addresses, Market, CM CLI)
- 2 - SESM database tools
- 3 - SESM related applications configuration (MG9K, LMM, CICM)
- 4 - SESM provisioning configuration
- 5 - SESM logging configuration (syslog, sesm debug log)
- 6 - view sesm configuration settings
- 7 - SESM refresh properties

X - exit

select - **x**

#

#### 1.14.4 NPM command pfrsCli

NPM command pfrsCli stops requiring user to input CM CLI manually. It reuses the CM CLI in /etc/profile.

```
zsups231:/opt/nortel/NTnpm/bin> ./pfrscli
```

PFRS Configuration

- 1 - View
- 2 - Enable/Reconfigure
- 3 - Disable
- 4 - Patch retrieval (Now)
- 5 - Generate Report (Now)

X - exit

select - 2

Enter the hostname/IP of the patch file drop-off server [127.0.0.1]:47.153.146.200

220 ProFTPD 1.2.8 Server (Authorized Use Only) [zsups228]

Enter userid used to connect to the patch file drop-off server [ANONYMOUS]:maint

Enter password used to connect to the patch file drop-off server :maint

220 ProFTPD 1.2.8 Server (Authorized Use Only) [zsups228]

PFRS may not work if this user/passwd is used

Do you want to continue ? [n]:y

Enter time for patch retrieval cycle (hh:mm) [23:07]:10:00

Enter time for report generation cycle (hh:mm) [23:07]:10:00

Patch retrieval next cycle will be: 06-16-04 10:00

Report generation next cycle will be: 06-16-04 10:00

PFRS Configuration

- 1 - View
- 2 - Enable/Reconfigure
- 3 - Disable
- 4 - Patch retrieval (Now)
- 5 - Generate Report (Now)

X - exit

select - x

```
zsups231:/opt/nortel/NTnpm/bin>
```

## 1.15 OSSGate Interface Changes

None.

## 1.16 Security

None.

## 1.17 Configuration Walkthrough

Provisioning/configuring component software and services.

# *Product = CS 2000 Management Tools*

## **A00006635--SESM Support for Cable Gateway Event Messaging** *Functional Description*

### 1.1 Applicable Solution(s)

IAC

### 1.2 Description

In SN08, a new table NENDPT will be introduced to the Core which is used to map the gateway/endpoint with LEN in CM, which can be used to create the event messaging records that are sent to north bound OSS. In order to meet this, all the small gateways need to be pre-provisioned when they are associated to system.N/A.

#### 1.2.1 Existing Functionality

Prior to SN08, only MG9K and CICM gateways have been pre-provisioned when the gateway is associated to the system. For small gateways ("C" LGRP type gateways), the endpoint in GWCEM and lens in the Core are populated/deleted by Line Provisioning when customers configure service for the gateway using NEW/OUT command.

On the other hand, Core has no knowledge about the mapping relationship of Lens and endpoint and gateways.

#### 1.2.2 Feature Functionality

In SN08 release, the provisioning data will be added to CS2K from CS2M-SESM component. It is used to do the datafill of CM table LNENDPT. LNEDNPT is an new table for SN08, which is used to map gateway/endpoints and Lens in CM.

Cable gateways (small line gateways) will be pre-provisioned when the MG is associated to system, which means endpoints and Lens will be pre-populated in GWCEM and the Core during the MG addition period.

The general strategy is, for those Dqos gateways, generate endpoints in SESM and populate both LNINV and LNENDPT table in the Core; for other small line gateways, only populate endpoints and LNINV table.

Due to the pre-provisioning in SN08, the gateways which are associated to the system prior this feature need to be converted to populate endpoints and Lens, which means a upgrade process must be provided.

And since all the Lens pre-provisioned for small gateways have HASU status in LNINV table, it is necessary to provide a new interface for OSSGate to retrieve these HASU lens.

### **1.2.3 Node Provisioning**

#### **1.2.3.1 Associate MG**

MG association requires an additional process to populate LNINV & LNENDPT in the Core and generate endpoints in GWCEM.

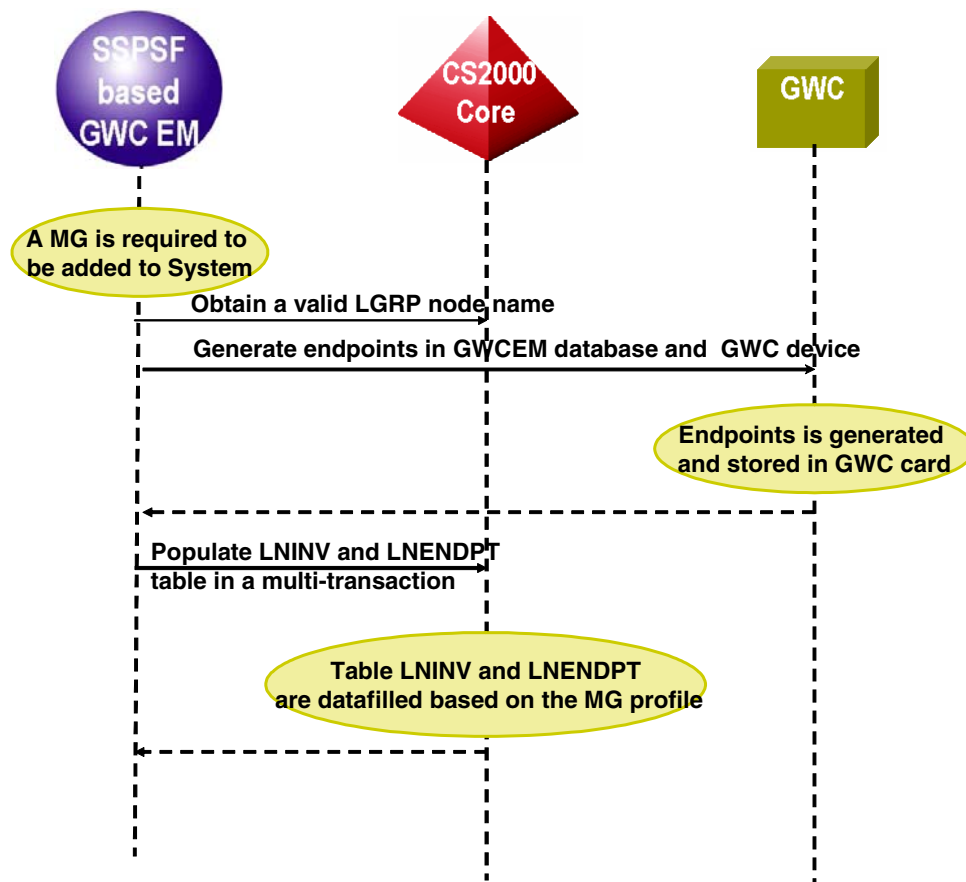
This functionality has no effect on CS2K GUI.

1. Cs2kCfgMgr receive the MG association request and verify whether it is a small line gateway.
2. If the MG request is a small line gateway, Cs2kCfg will retrieve the CCM layer version from the Core through XaCore. If the Core is upgraded to SN08, endpoints will be pre-provisioned in GWCEM and GWC Device, then LNINV table will be populated (LNENDPT is also populated as well if the MG is a Dqos gateway).
3. If the Core is still SN07 or before, the MG is added to system just like what was done in SN07.

Table 6 Table LNENDPT example datafill

| TABLE: LNENDPT |          |                     |
|----------------|----------|---------------------|
| LEN            | ENDPOINT | GATEWAY             |
| LG 00 0 00 00  | aaln/1   | test_gw1.nortel.com |
| LG 00 0 00 01  | aaln/2   | test_gw1.nortel.com |
| LG 00 0 00 02  | aaln/3   | test_gw1.nortel.com |
| LG 00 0 00 03  | aaln/4   | test_gw1.nortel.com |
| LG 00 0 00 04  | aaln/1   | test_gw2.nortel.com |
| LG 00 0 00 05  | aaln/2   | test_gw2.nortel.com |

Figure 3 GWCEM flow through for small line MG Association in SN08





### 1.2.3.2 Disassociate MG

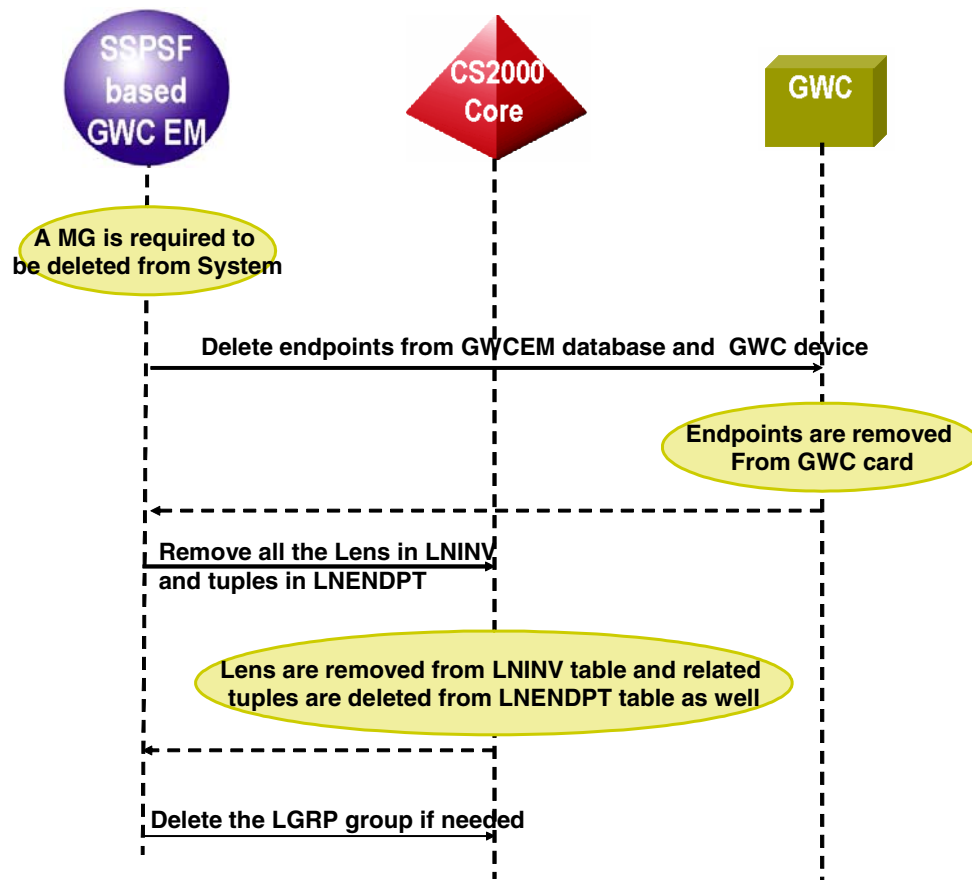
Cs2kCfgMgr will take different actions based on the Core CCM layer version when a delete MG request is arriving.

This functionality has no effect on CS2K GUI.

1. Before the request is performed, Cs2kCfgMgr will first retrieve the CCM layer version of the Core.
2. If Core is SN07 or before, the MG will be delete as it was in SN07, which means backward compatibility must be supported.
3. If the Core is upgraded to SN08, Lens will be first delete from the Core, then the endpoints in GWCEM will be deleted as well.

An automatic rollback will be done when the disassociateMG operation fails to rollback the lens and endpoints deleted before failure occurs. And an appropriate message like following will be returned to client.

Figure 4 GWCEM flow through for MG disassociation in SN08



### 1.2.3.3 Change MG

Only changing reserved endpoints capacity for a specific MG is affected by this functionality.

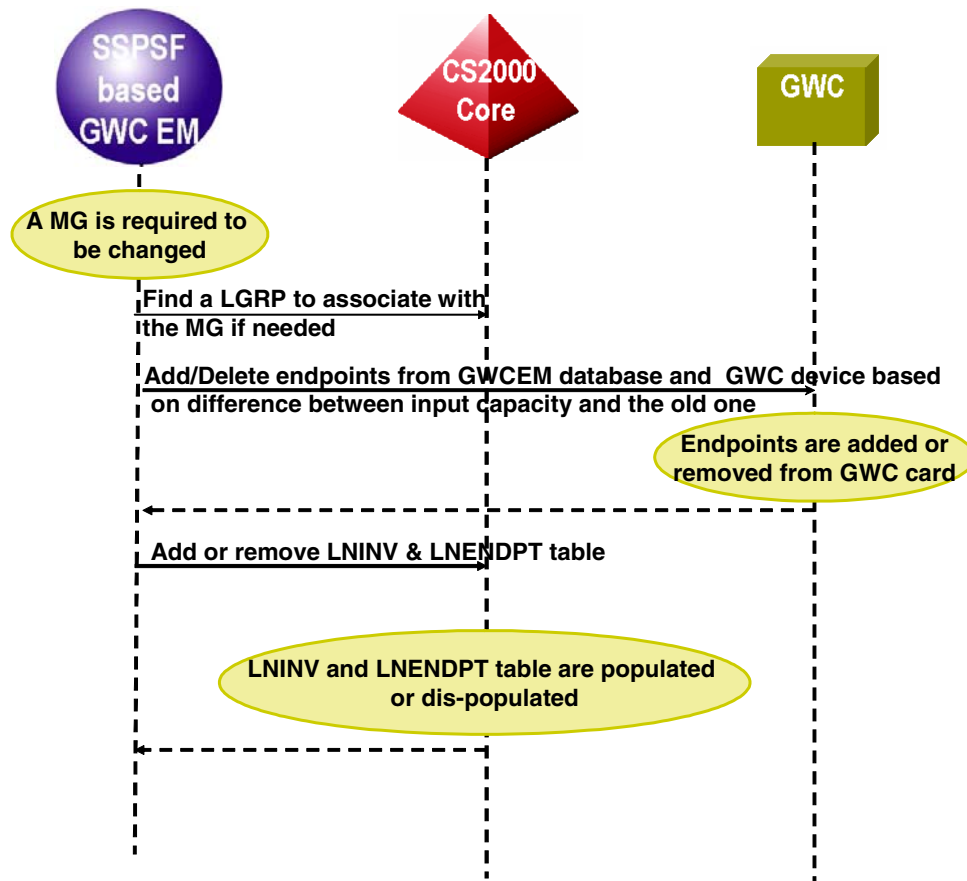
Again, CS2K GUI has not been affected for this functionality.

1. When a changing reserved endpoint request is arriving, Cs2kCfgMgr will first retrieve the Core CCM layer version and take corresponding action based on the CCM version.
2. If the Core is prior to SN07, the gateway will be changed just as what has been done in SN07.
3. If the Core is upgraded to SN08, the additional endpoint/lens will be populated if the input changed reserved capacity is larger than the prior one. Otherwise, some endpoints/lens will be delete.

The total amount of adding/deleting is equal to the difference between input capacity and the prior one.

And also, an automatic rollback process will be done once the changeMG operation fails. All the Lens and endpoints populated before failure occurs will be deleted and an appropriate message like following will be returned to client.

Figure 5 GWCEM flow through for changing MG in SN08



#### 1.2.3.4 OSSGate enhancement

Since all the small line gateways will be pre-provisioned in SN08, the lens pre-populated in the Core should be in HASU status. So it is necessary to provide a interface for OSSGate to show the HASU lens so that customer can select one to configure service.

The detail request/response/error message will be defined later.

#### 1.2.3.5 Node Provisioning Recovery

This functionality provides an activity to allow node provisioning to be recovered when a provisioning operation (Associate/Disassociate/Change MG) is abort or disrupted by a server switch over or crash.

The recovery can be running without user's participation and has no effect on GUI.

This functionality is running at the server side and has no affect on the CS2K GUI. And this activity will be finished automatically without customer's participating.

### 1.2.4 Upgrade

Due to the pre-provisioning for small line gateway, for those gateways which was added prior to SESM/Core upgrading to SN08, an automated upgrade process will be responsible for pre-provisioning LNINV and possibly LNENDPT tables in the XACore following the XACore upgrade.

This functionality has no affect on CS2K GUI. But probably a alarm will be raised if upgrade is failed or disturbed.

The alarm detail will be:

|                                                                             |
|-----------------------------------------------------------------------------|
| Alias Name: EventMessagingUpgrae                                            |
| Category: Processing Error                                                  |
| Alarm Time: hh:mm:ss DD-MM-YYYY <TimeZone Info>                             |
| Severity: Major                                                             |
| Probable Cause: "Upgrade Failure"                                           |
| SpecificProblem: The Event Messaging Upgrade failed or has been interrupted |

#### 1.2.4.1 Notes:

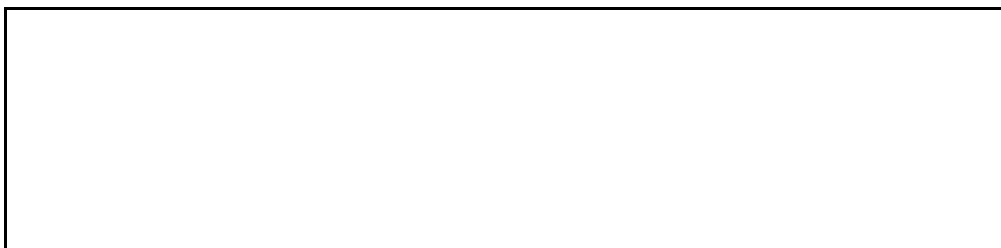
In the case of following gateway upgrade or for gateways provisioned following the CS2K upgrade, the LEN may be used in OSSGate commands interchangeably with gateway/termination. Use of LEN will NOT cause data corruption as is currently documented in the OSSGate User's Guide.

#### 1.2.4.2 Limitations:

Upgrade process probably last several hours to convert all the gateways in a large lab. During the upgrade period,

1. Conversion begins when CM completes upgrade to SN08 load. SESM detects upgrade and SN07 behavior for Lines Provisioning of Small MG's (C type LGRPs) is disabled and SN08 behavior commences. SN08 behavior requires LEN to be pre-populated in LNINV
2. New service requests or move service requests that include a LEN not yet populated in LNINV will fail. OSSGate will return SERVORD error message from the CM. Any Line Prov command that references an empty LNINV tuple fails. Line is not HASU in LNINV thus SERVORD fail.

The following error message indicating Lens is not existing might be returned to client if user attempt to execute NEW commands at upgrade time on a gateway which is not yet pre-provisioned.



3. A minor alarm will be provide to identify the conversion progress on a GWC basis. Alarm clears when conversion is completed.
4. Line Prov audit will be disabled to prevent delaying completion of the conversion and possibly erroneous results.
5. Node provisioning (change MG / Disassociate MG) will be block during the MG's converting. Following error message will be returned to client if user want to change/Disassociate a specific MG during this gateway upgrade.

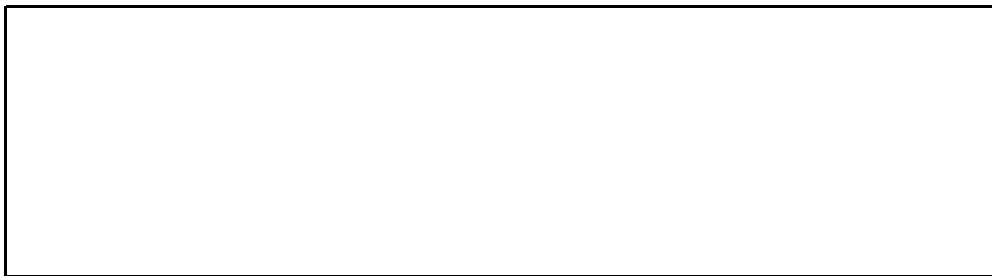
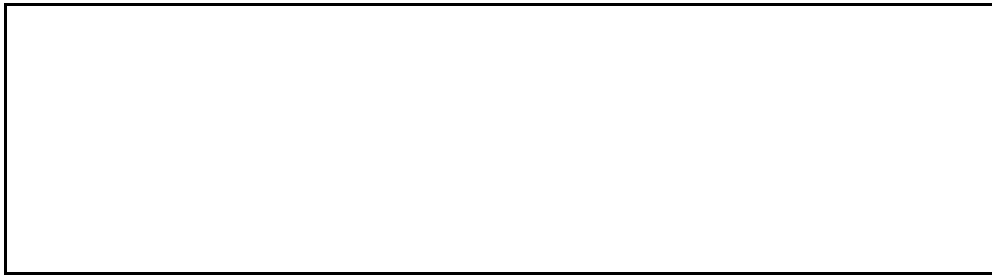
#### ChangeMG error message from OSSGate during upgrade

```
<?xml version="1.0" encoding="UTF-8" ?> <CommandList>
  <Response><Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <changeMG usn="1" version="1.0">
        <RC>20</RC><mgUIName>mg1.nortel.net</mgUIName>
        <MsgTxt> mg1.nortel.net Change MG Failed - The MG is under upgrade.Please try
again later.
        </MsgTxt>
      </changeMG>
    </Methods>
  </Response>
</CommandList>
```

#### DisassociateMG error message from OSSGate during upgrade

```
<?xml version="1.0" encoding="UTF-8" ?> <CommandList>
  <Response><Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <disAssocMG usn="1" version="1.0">
        <RC>20</RC><mgUIName>mg1.nortel.net</mgUIName>
        <MsgTxt> mg1.nortel.net DisAssocMG Failed - The MG is under upgrade.Please try
again later.
        </MsgTxt>
      </disAssocMG>
    </Methods>
  </Response>
</CommandList>
```

The error message shown on GUI will be filled later.



### 1.2.5 Audit Enhancement

Prior to SN07, any HASU lens which LGRP type is “C” will be considered as an error. But in SN08, since all the “C” type LGRP gateways will be pre-provisioned, the case above is no longer an error. So Audit system must be enhanced to handle the case.

On the other hand, a new table LNENDPT has been introduced into SN08, which also needs audit to ensure that GWCEM keeps consistent with the Core.

The following error situation will be detected and corrected.

1. Endpoint exists in GWCEM but the corresponding Len is NOT existed in Core.
2. Lens exists in Core but the corresponding endpoint is NOT existed in GWCEM.

*Note:* The two scenarios above has already cover by current LineDataIntegrity Audit.

3. Endpoint exists in GWCEM but the corresponding tuple is NOT existed in LNENDPT table of Core.
4. The tuple exists in LNENDPT table but the corresponding endpoint is NOT existed in GWCEM.

During the process, audit will not raise the alarm, instead, the correct matched data will be logged into a report file, and the detected problem will be logged

into another report file. The file will be loaded into a report shown on GUI when audit completes.

Limitations:

Line Audit will be disabled when upgrade is in progress. If a Line Audit is scheduled to start when the upgrade is running, a message like “Gateways upgrade is in progress. Please run Audit again later.” will be returned to client.

If the upgrade process finds that the Line Audit is running when it starts, it will sleep for a while and retry to restart until the Line Audit finishes.

### **1.3 Hardware Requirements or Dependencies**

N/A.

### **1.4 Software Requirements or Dependencies**

This feature requires SN08 XA-Core Load or later.

### **1.5 Limitations and restrictions**

N/A.

### **1.6 Interactions**

### **1.7 Glossary**







# SN08 Feature Deltas

***Product = CS 2000 Management Tools***

## **A00007007--Session Border Controller - Application Layer Gateway**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAC

#### **1.2 Description**

This activity provides a way for a network operator to separate the Cable hosted network IP address space from the service provider operator IP address space. It will allow the connection of two different IP address space domains without having to understand the exact IP address within the other domain.

This is accomplished through the use of an Application Layer Gateway (ALG). ALGs are NATs that understand the application (in this case, NCS protocol) and enable the application to continue to work even though it is “behind” the NAT. The ALG provides a single IP address interface to the CS2K via a GWC while interfacing to multiple small gateways each with its own unique IP address. For the purposes of this document, these small gateways are said to “subtend” the ALG. The IP address of the gateways which subtend the ALG are not known to the CS2K and thus will be set to 0.0.0.0 during provisioning.

The ALG is positioned in the path of packets flowing from media gateways and media gateway controllers. In this level the ALG provides a level of packet translation without directly participating in the media flow, that is to say the ALG does not directly establish a media path like a gateway, instead it serves as a proxy for the media through a request from the Call Server.

Generally the ALG is transparent to the call server; however to support the insertion of an ALG, the call server must be able to let multiple gateways share a single IP address.

### **1.2.1 Adding an ALG through SESM**

To add an ALG and associate it to a gateway, the following steps must be taken:

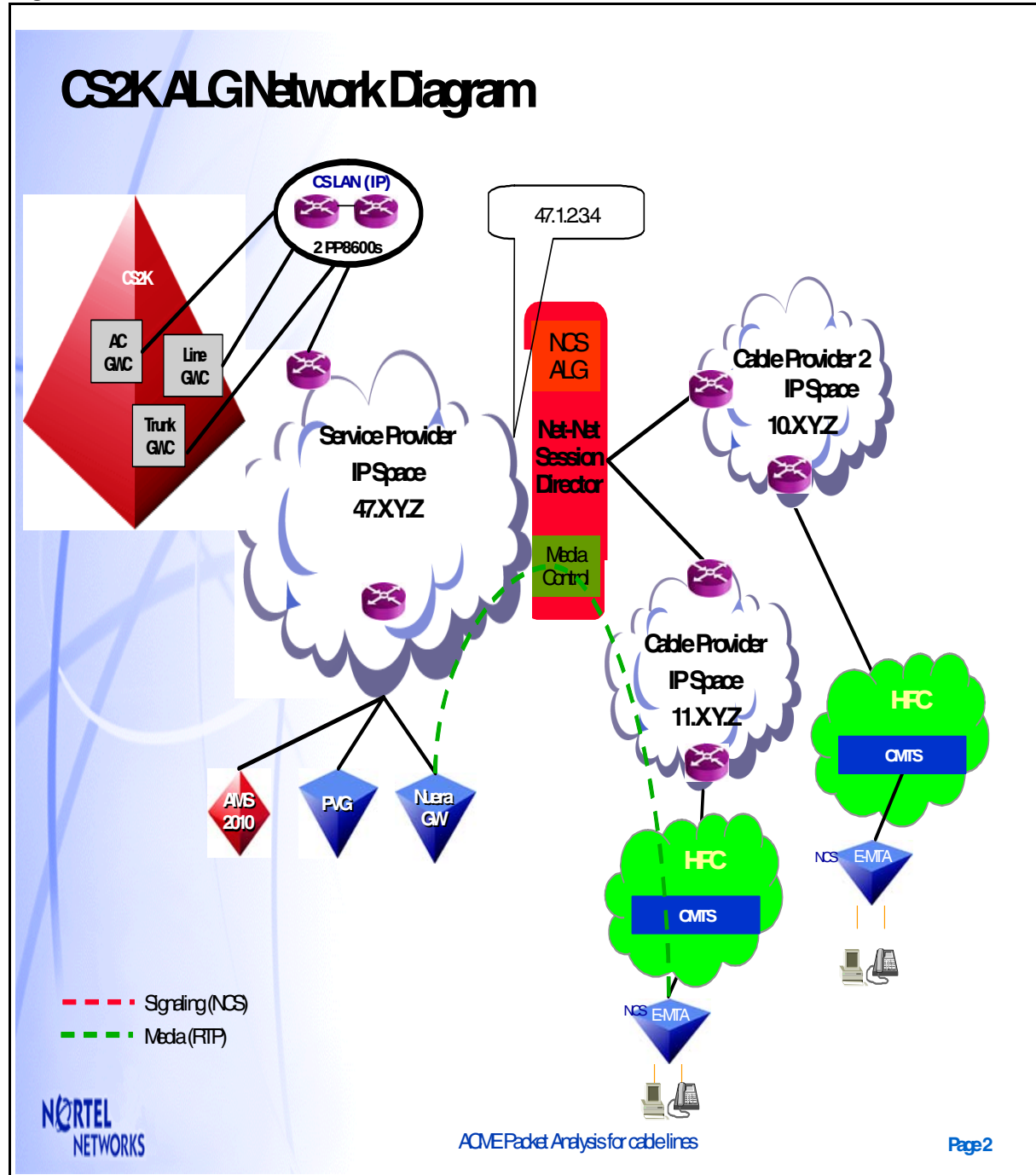
1 - From the Network Device view click on the new ALG tab (see section 1.3.1)

2 - Click Add

3 - The new 'Add ALG' panel is presented, enter the appropriate data. Note: the Port field will be pre-set to the NCS well known port value. It can however be changed by the user (see section 1.3.2)

4 - To associate an ALG while provisioning a new gateway, select the 'Associate Gateway' pull down option from the Configuration pull down menu. When the new panel is presented, provide the gateway name, the gateway profile and the gwc number. When the gateway profile selected is the NCS supported profile, two radio buttons will appear, one for Pep Server and one for ALG. Once the ALG radio button is selected the ALG name must be provided in the field next to the radio button. At this point, the ip address of the gateway will be presented as 0.0.0.0 (see section 1.3.3)

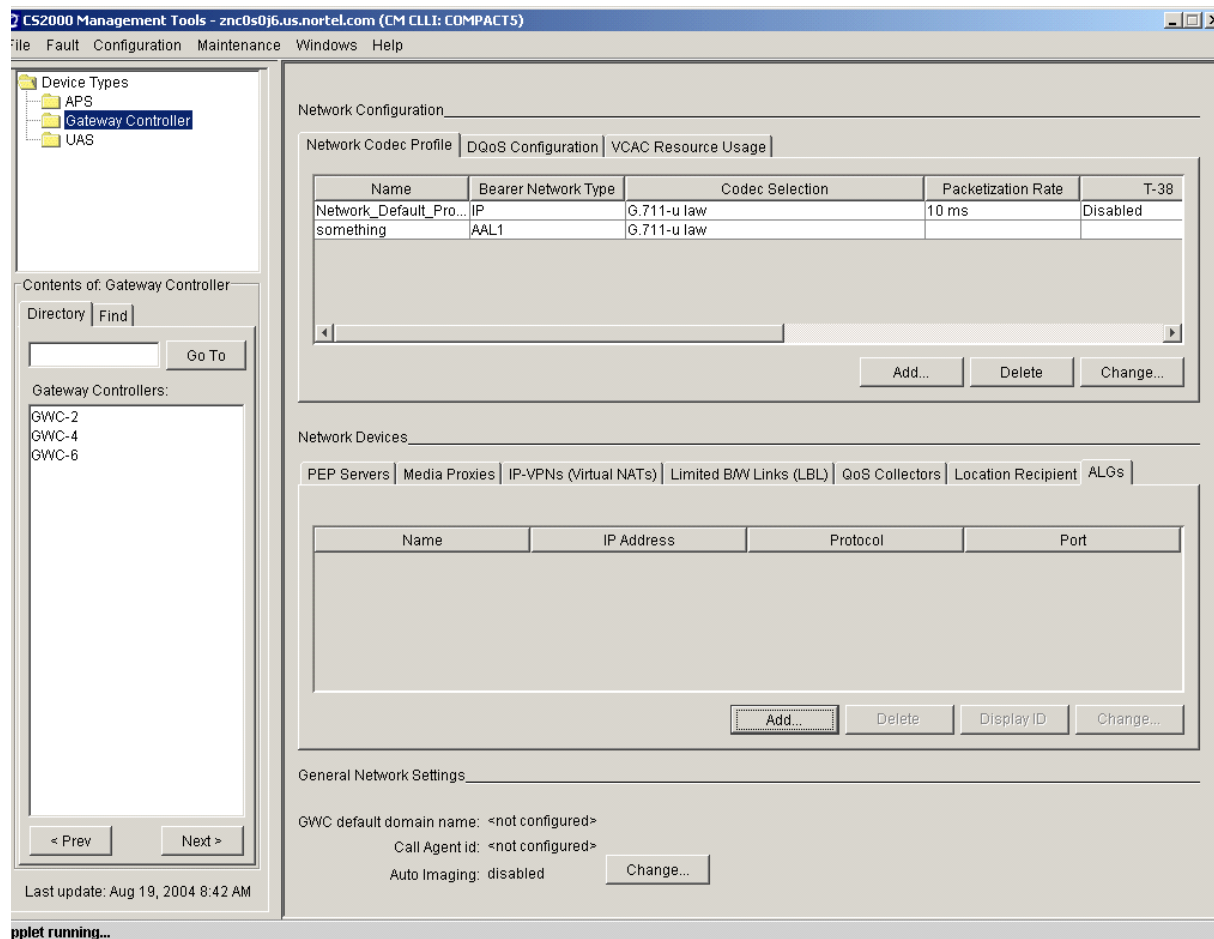
5 - To change ALG assigned to a particular gateway, or to associate an ALG to an existing gateway, select the GWC associated with the gateway, select the Provisioning tab, Gateways tab and retrieve all the gateways. Highlight the gateway to be changed, select 'Change' at the bottom. The 'Change Gateway' panel is presented. Select 'Change ALG'. Enter the new ALG name to be associated (see section 2.8.4)

**Figure 1 A view of how the ALG will be inserted into our network.**

## 1.3 GWC-EM ALG Provisioning

### 1.3.1 New ALG Nat Tab

The main GUI panel will be modified to add a new tab to allow provisioning of the ALG Nat. The GUI will be presented as follows:



### 1.3.2 New ALG provisioning Panel

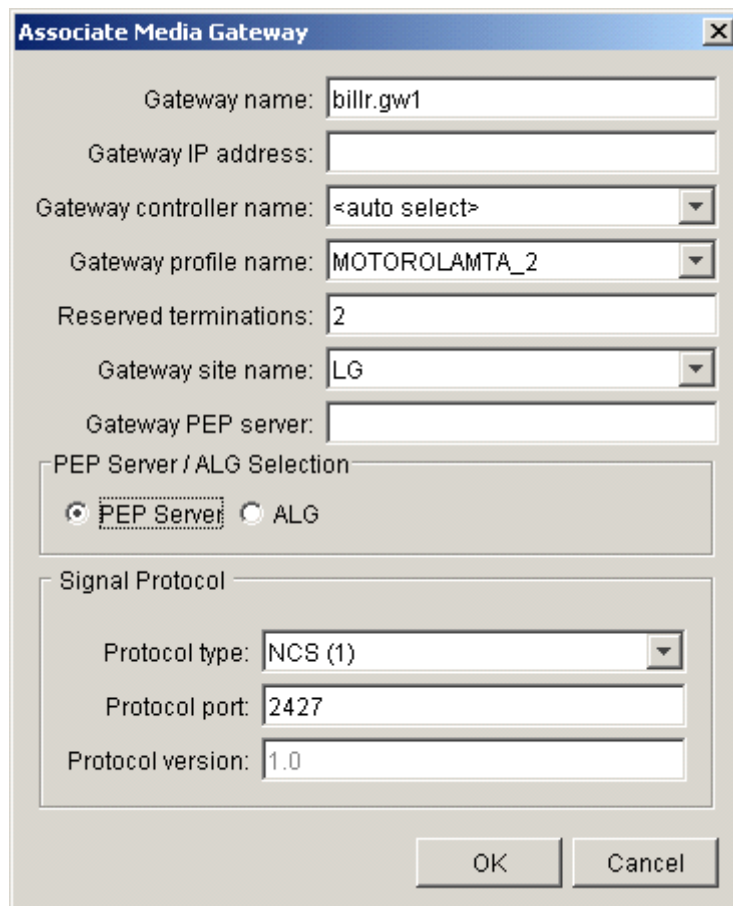
A new pop panel will be provided to add an ALG to the network. The panel will be presented as follows:

The "Add ALG" dialog box contains the following fields and buttons:

- Name:** Text input field
- IP Address:** Text input field
- Port:** Text input field
- Protocol:** Text input field with "NCS" entered
- OK** button
- Cancel** button

### 1.3.3 Associate Gateway GUI

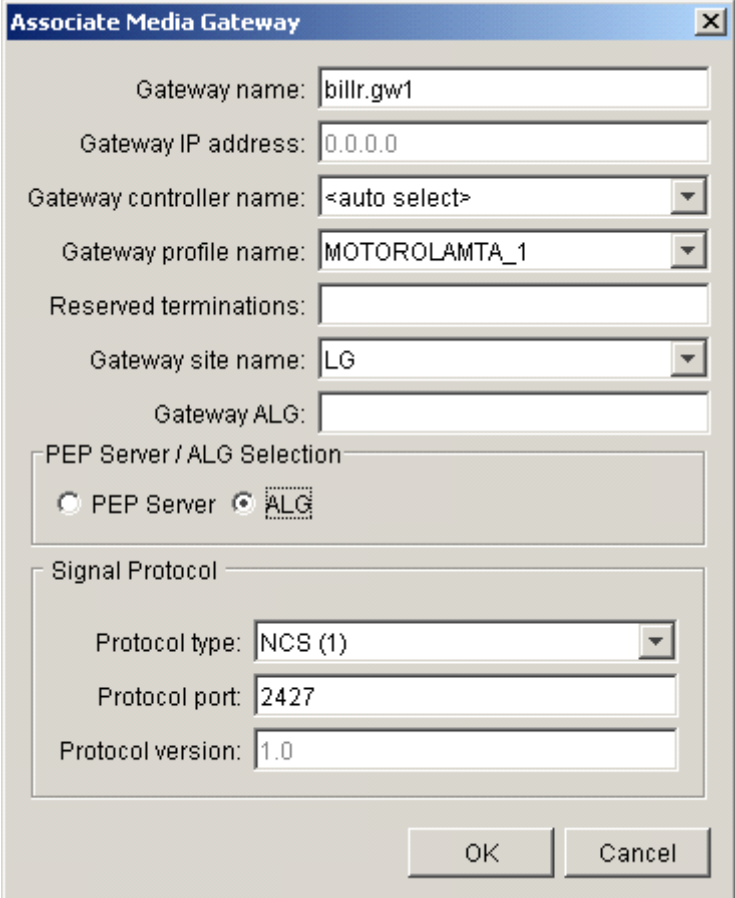
The associate gateway dialogue has been modified to allow the user to associate a new gateway to a GWC, at which time you can associate an ALG Nat to the new gateway. Two options will be provided to allow for either a Pep Server or ALG to be assigned. When the Pep Server radio button is selected the panel will appear as follows:



The image shows a Windows-style dialog box titled "Associate Media Gateway". It contains several input fields and two main sections. The fields are: "Gateway name:" with the value "billr.gw1", "Gateway IP address:" (empty), "Gateway controller name:" with a dropdown menu showing "<auto select>", "Gateway profile name:" with a dropdown menu showing "MOTOROLAMTA\_2", "Reserved terminations:" with the value "2", "Gateway site name:" with a dropdown menu showing "LG", and "Gateway PEP server:" (empty). Below these is a section titled "PEP Server / ALG Selection" containing two radio buttons: "PEP Server" (which is selected) and "ALG". Below that is a section titled "Signal Protocol" containing three input fields: "Protocol type:" with a dropdown menu showing "NCS (1)", "Protocol port:" with the value "2427", and "Protocol version:" with the value "1.0". At the bottom right are "OK" and "Cancel" buttons.

| Field                      | Value                                                                 |
|----------------------------|-----------------------------------------------------------------------|
| Gateway name:              | billr.gw1                                                             |
| Gateway IP address:        |                                                                       |
| Gateway controller name:   | <auto select>                                                         |
| Gateway profile name:      | MOTOROLAMTA_2                                                         |
| Reserved terminations:     | 2                                                                     |
| Gateway site name:         | LG                                                                    |
| Gateway PEP server:        |                                                                       |
| PEP Server / ALG Selection | <input checked="" type="radio"/> PEP Server <input type="radio"/> ALG |
| Signal Protocol            |                                                                       |
| Protocol type:             | NCS (1)                                                               |
| Protocol port:             | 2427                                                                  |
| Protocol version:          | 1.0                                                                   |

When the ALG radio button is selected, a field will be provided to enter the ALG name. The panel will be presented as follows:



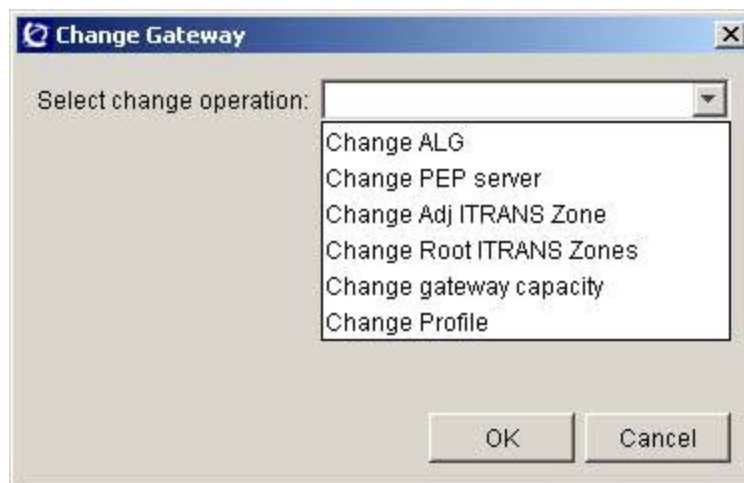
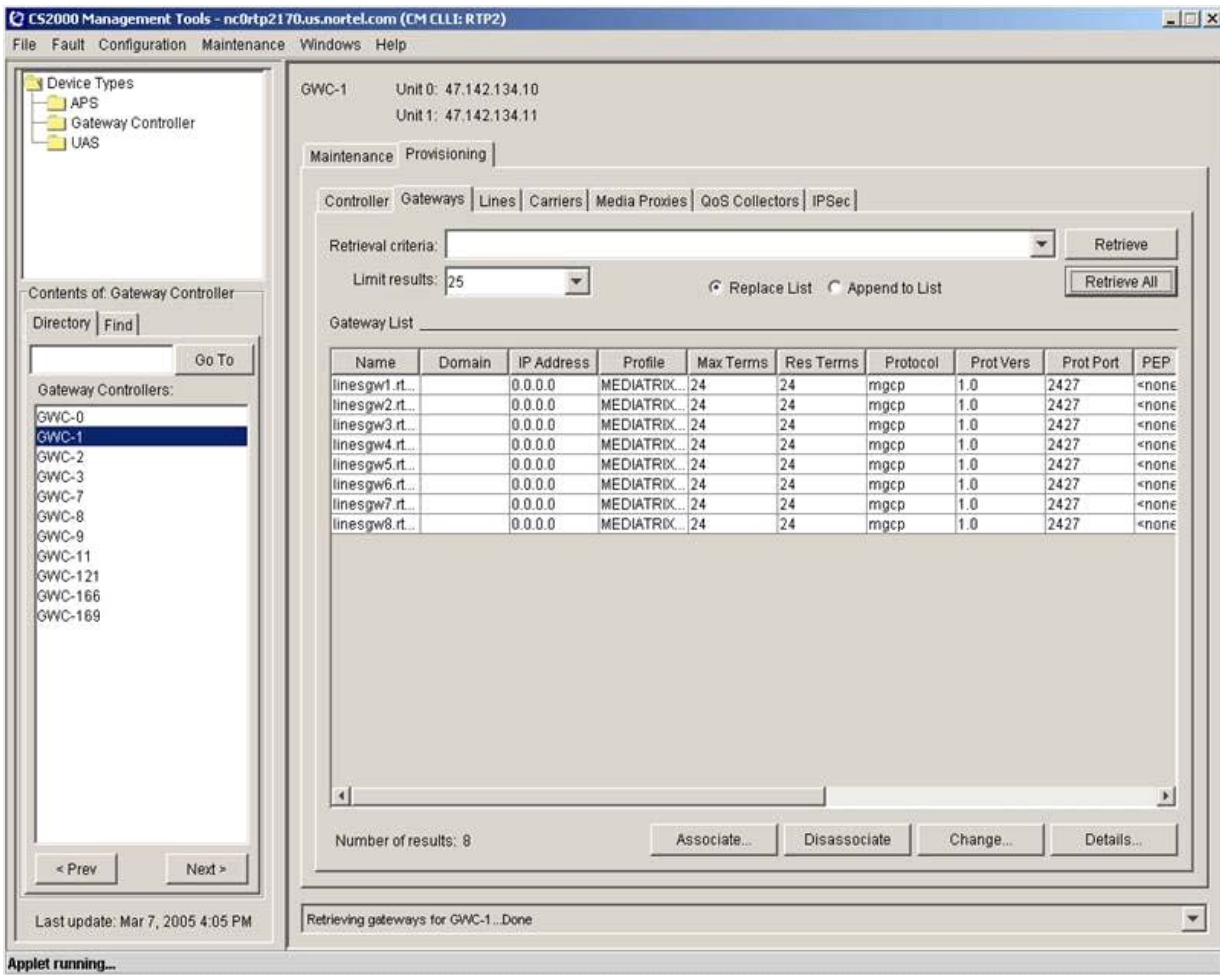
The image shows a Windows-style dialog box titled "Associate Media Gateway". It contains several input fields and a section for selecting between PEP Server and ALG. The fields are: Gateway name (billr.gw1), Gateway IP address (0.0.0.0), Gateway controller name (<auto select>), Gateway profile name (MOTOROLAMTA\_1), Reserved terminations (empty), Gateway site name (LG), and Gateway ALG (empty). Below these is a "PEP Server / ALG Selection" section with two radio buttons: "PEP Server" (unselected) and "ALG" (selected). Below that is a "Signal Protocol" section with three fields: Protocol type (NCS (1)), Protocol port (2427), and Protocol version (1.0). At the bottom right are "OK" and "Cancel" buttons.

|                                  |                                      |
|----------------------------------|--------------------------------------|
| Gateway name:                    | billr.gw1                            |
| Gateway IP address:              | 0.0.0.0                              |
| Gateway controller name:         | <auto select>                        |
| Gateway profile name:            | MOTOROLAMTA_1                        |
| Reserved terminations:           |                                      |
| Gateway site name:               | LG                                   |
| Gateway ALG:                     |                                      |
| PEP Server / ALG Selection       |                                      |
| <input type="radio"/> PEP Server | <input checked="" type="radio"/> ALG |
| Signal Protocol                  |                                      |
| Protocol type:                   | NCS (1)                              |
| Protocol port:                   | 2427                                 |
| Protocol version:                | 1.0                                  |

OK Cancel

### 1.3.4 Change Gateway Association

An additional option will be added to the existing change gateway panel to include ALG option. Once the ALG option is selected another panel is provided which allows input of the ALG name to be associated to the gateway. The two panels will be presented as follows:



## 1.4 XML Interface

This feature implements an XML based command and response protocol. XML command documents are transported via Telnet within the context of a session to the OSSGate component in the SESM. The session is established via a secure logon sequence.

The application supporting this feature receives the XML document instance validates it and then processes the command.

A reply or response XML document instance is returned to the originating Telnet session.

The XML command and response documents for each of the new and modified operations are described in the following sections.

The AssocMG and QueryMG interface has been modified to allow/display ALGs configured in the system.

The following new XML commands have been provided:

- AssocMG
- QueryMG
- ChangeMGGWCEMData
- GetALGData
- getAlgNamesbyGWCId



## 1.4.1 AssocMG command

**Figure 2 XML command AssocMG**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <assocMG usn="1" version="1.0">
        <Parameters>
          <mgUIName>MGXML.5</mgUIName>
          <mgProfileName>MOTOROLAMTA_2</mgProfileName>
          <mgIpAddr>0.0.0.0</mgIpAddr>
          <mgProtocolType>4</mgProtocolType>
          <mgProtocolVersion>1.0</mgProtocolVersion>
          <mgProtocolPort>2427</mgProtocolPort>
          <gwcUIName>GWC-113</gwcUIName>
          <reservedTerminations>4</reservedTerminations>
          <algName>ALG1-0</algName>
        </Parameters>
      </assocMG>
    </Methods>
  </Command>
</CommandList>
```

## 1.4.2 QueryMG command

**Figure 3 XML command for queryMG (No change)**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <queryMG usn="1" version="1.0">
        <Parameters>
          <mgUIName>MGXML.5</mgUIName>
        </Parameters>
      </queryMG>
    </Methods>
  </Command>
</CommandList>
```

**Figure 4 XML response for queryMG**

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
<Response>
<Interface>cs2kCfgMgrIf</Interface>
<Methods><queryMG usn="1" version="1.0">
<ReturnData>
<Row>
      <mgUIList>MGXML.5</mgUIList>
      <mgIpList>0.0.0.0</mgIpList>
      <callServerId>CABLAB</callServerId>
      <gwcUIName>GWC-0</gwcUIName>
      <svcTypeList>0</svcTypeList>
      <svcTypeList>4</svcTypeList>
      <nodeName>LG 00 0</nodeName>
      <pepServerName>NOT_SET</pepServerName>
      <algName>ALG1-0</algName>
      <engrEndPoints>2</engrEndPoints>
      <protType>ncsprotocol</protType>
      <protVersion>1.0</protVersion>
      <protPort>2427</protPort>
      <profileName>MOTOROLAMTA_2</profileName>
      <maxEngrEndPoints>2</maxEngrEndPoints>
      <frameNumber>not_set</frameNumber>
      <unitNumber>not_set</unitNumber>
      <frameType>not_set</frameType>
      <floorPos>not_set</floorPos>
      <rowPos>not_set</rowPos>
      <framePos>not_set</framePos>
      <unitPos>not_set</unitPos>
    </Row>
    <RC>0</RC>
    <MsgTxt>Query of a Single MG was
      successful</MsgTxt>
  </ReturnData>
</queryMG>
</Methods>
</Response>
</CommandList>
```

### 1.4.3 ChangeMGGWCEMData Command and Response

An example instance of a ChangeMGGWCEMData command follows:

**Figure 5** ChangeMGGWCEMData command instance example

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ALGOSSIf</Interface>
    <Methods>
      <changeMGGWCEMData usn="135" version="1.0" >
        <Parameters>
          <MGUIName>MG1</MGUIName>
          <algName>billr.alg1</algName>
        </Parameters>
      </changeMGGWCEMData>
    </Methods>
  </Command>
</CommandList>
```

An example instance of the response to ChangeMGGWCEMData command follows:

**Figure 6** ChangeMGGWCEMData Response XML instance example

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Response>
    <Interface>ALGOSSIf</Interface>
    <Methods>
      <changeMGGWCEMData usn="135" version="1.0">
        <ReturnCode value="0" text="Successful result" />
        <MsgTxt>MG ALG association changed successfully</MsgTxt>
      </changeMGGWCEMData>
    </Methods>
  </Response>
</CommandList>
```

#### 1.4.4 GetALGData Command and Response

An example instance of a GetALGData command follows:

**Figure 7 GetALGData command instance**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ALGOSSIf</Interface>
    <Methods>
      <getALGData usn="1" version="1.0" >
        <Parameters>
          <algName>billr.alg1</algName>
        </Parameters>
      </getALGData >
    </Methods>
  </Command>
</CommandList>
```

A response example to the GetALGData command follows:

**Figure 8 GetALGData Response XML document**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Response>
    <Interface>ALGOSSIf</Interface>
      <Methods>
        <getALGData usn=123 version=1.0>
          <ReturnCode value="0" text="Successful result" />
          <MsgTxt>Data Available</MsgTxt>
          <algName>billr.alg1</algName>
          <ServerType>DQoS</ServerType>
          <IPAddress>47.192.234.88</IPAddress>
          <Port>2427</Port>
        </getALGData>
        <getALGData usn=124 version=1.0>
          <ReturnCode value="0" text="Successful result" />
          <MsgTxt>Data Available</MsgTxt>
          <algName>billr.alg1</algName>
          <ServerType>DQoS</ServerType>
          <IPAddress>47.192.234.100</IPAddress>
          <Port>2427</Port>
        </getALGData>
      </Methods>
    </Response>
  </CommandList>
```

### 1.4.5 getAlgNamesbyGWCIId Command and Response

An example instance of a getAlgNamesbyGWCIId command follows:

**Figure 9 getAlgNamesbyGWCIId example XML document instance**

```
<?xml version="1.0"?>
<CommandList>
  <Command>
    <Interface>ALGOSSIf</Interface>
    <Methods>
      <getAlgNamesbyGWCIId usn="1", version="1.0">
        <Parameters>
          <GWC>GWC_1</GWC>
        </Parameters>
      </getAlgNamesbyGWCIId>
    </Methods>
  </Command>
</CommandList>
```

An example getAlgNamesbyGWCIId response is shown below:

**Figure 10 getAlgNamesbyGWCIId example XML instance response**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Response>
    <Interface>ALGOSSIf</Interface>
    <Methods>
      <getAlgNamesbyGWCIId usn="1" version="1.0">
        <ReturnCode value="0" text="Successful result" />
        <MsgTxt>Data Available</MsgTxt>
        <GWC>GWC_1</GWC>
        <algName>billr.alg1</algName>
        <algName>billr.alg2</algName>
        <algName>billr.alg3</algName>
        <algName>billr.alg4</algName>
        <algName>billr.alg5</algName>
      </getAlgNamesbyGWCIId>
      <getAlgNamesbyGWCIId usn="2" version="1.0">
        <ReturnCode value="0" text="Successful result" />
        <MsgTxt>Data Available</MsgTxt>
        <GWC>GWC_5</GWC>
        <algName>billr.alg6</algName>
        <algName>billr.alg7</algName>
        <algName>billr.alg8</algName>
      </getAlgNamesbyGWCIId>
    </Methods>
  </Response>
</CommandList>
```

## 1.5 Hardware Requirements or Dependencies

No new hardware is required. The application components provided by this feature execute as part of the SESM and GWC.

Integration will be performed with the ACME Net-Net Session Director.

## 1.6 Software Requirements or Dependencies

No new software or firmware dependencies are introduced by this feature.

## 1.7 Limitations and restrictions

### 1.7.1 ALG Limitations

- The CS2K has a limit of 2000 “middleboxes” which is the number of ALGs, PEP servers, NATs and media Proxies combined.
- The CS2K has a limit of 200 ALG middlebox.
- A single GWC on the CS2K has a limit of 20 ALG middleboxes.
- ALGs can only be provision against MTA gateways.
- ALG only supports the NCS protocol.
- Although the ALG solution does not require it, 64 character FQDN support requires that each domain (cable hosted customer) use separate GWC pairs.
- If the ALG does not transmit Audit Endpoint (AUEP) messages to the MTA before the MTA sends its first message (typically an RSIP) then the lines in the CS2K will appear SYSB because the Audit Endpoint is rejected or not responded to. This could happen in the event that the ALG loses all state information and requires the first MTA originated message to re-establish its bindings. To correct this problem, the MTA needs to send any message, e.g. an RSIP or an offhook and this will re-establish the binding and clear the SYSB state on the line. This problem will not occur if the ALG vendor supports discovery through the use of DNS of the MTA IP Address before the MTA sends its first message.

### 1.7.2 Packet Cable Protocol Limitations

- DQoS is not supported on an MTA behind an ALG. Nortel is not aware of any ALG on the market that supports DQOS.
- IPSEC is not supported since a NAT device will cause end to end (GWC to MTA) security to fail because of the IP address and message content manipulation done by the ALG.
- Packetcable Electronic Surveillance can not be fully supported with an ALG. This is because the specification requires the transport of the MTA IP address which is not available to the CS2K. However, regular DMS packet electronic surveillance is supported.
- Event Messaging is partially supported. We support event messaging, but since DQoS is not supported, CMTS records will not appear.

### 1.7.3 DNS Limitations

- If a Redirecting Media Gateway Controller (RMGC) is configured, the DNS servers must be configured correctly. For example the ALG upon receiving the response from the RMGC on the CS2K, must be able allow



the gateway to resolve the Fully Qualified Domain Name (FQDN) in the message thru DNS queries.

- DNS is not supported by the CS2K to discover the ALG IP address. We only support static configuration of the IP address of the ALG since it is not expected that there will be many ALGs.
- DNS is not required by the CS2K to discover the IP address of the MTA (although it may be used in the cable IP space) because the CS2K no longer needs the cable MTA IP address. Therefore DNS discovery is automatically disabled for gateways behind ALGs.

#### 1.7.4 Other CS2K Limitations

- The GWC specified must have the small lines gateway profile in order to support provisioning of ALG.
- When an ALG is associated to a gateway a DQOS PEP Servers, Low Band Width (LBL), IP-VPN Nats will not be allowed on the same gateway.
- The IP address of the gateway being associated with an ALG will not be modified. If the IP address field is left blank, the default value of 0.0.0.0 will be provision against the gateway.
- CS2K QoS collector will collect statistics as reported by the ALG. There is no separation of statistics between the ALG boundaries.
- A Nortel Media Proxy is not supported for the cable MTAs that are behind an ALG since they are both performing a similar function. However, the Media Proxy is supported for other gateways in the solution that need it.
- The real IP address of the MTA is not known by the call server and therefore the ALG IP address will be used in those cases.

## 1.8 Interactions

The following existing GUIs have been modified:

- New ALG dialog for creating the ALG
- Associate Media Gateway Dialog
- Change Gateway Dialog

The following XML commands have been modified:

- AssocMG
- QueryMG
- ChangeMGGWCEMData
- GetALGData
- getAlgNamesbyGWCId

The on-line help facility will be updated with information on the use, syntax and valid values for all the above modifications/additions.

## 1.9 Applicable customer facing sections

### Fault Management

Logs \_N/A\_

Alarms \_N/A\_

### Configuration

Data Schema \_X\_

User Interface \_X\_

Element Management \_N/A\_

Security \_N/A\_

Service Order \_N/A\_

Office Parameters \_N/A\_

Accounting (includes AMA billing) \_N/A\_

Performance (includes operational measurements) \_N/A\_

## 1.10 Glossary

| Term     | Description                 |
|----------|-----------------------------|
| New term | Definition                  |
| ALG      | Application Layer Gateway   |
| GWC      | Gateway Controller          |
| GW       | Gateway                     |
| SBC      | Session Border Controller   |
| NAT      | Network Address Translation |

## 1.11 Appendix A - XSD changes

The following changes will be made to support XML schema:

### Module : algbase.xsd:

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >
```

```

<xsd:include schemaLocation="../algossif/algcommon.xsd"/>
<xsd:include schemaLocation="../algossif/changemggwcemdata.xsd"/>
<xsd:include schemaLocation="../algossif/getalgdata.xsd"/>
<xsd:include schemaLocation="../algossif/getalgbygwcid.xsd"/>
<!--
*****
***** -->
<!-- ** Define Parser Convention Required elements -->
<!-- ** These are CommandList (root element), Comand, Interface, Methods -->
<!--
*****
***** -->
-->
<xsd:element name="CommandList" >
  <xsd:complexType >
    <xsd:sequence>
      <xsd:element name="Command" type="CommandType" />
    </xsd:sequence>
  </xsd:complexType >
</xsd:element>

<!-- Define CommandType -->
<xsd:complexType name="CommandType">
  <xsd:sequence>
    <xsd:element name="Interface" type="ALGOSSIfType" />
    <xsd:element name="Methods" type="ALGOSSIfMethodsType" />
  </xsd:sequence>
</xsd:complexType>

***** -->
<!-- ** Define ALGOSSIfType -->
<!-- ***** -->

<!-- ALGOSSIfType -->
<xsd:simpleType name="ALGOSSIfType">
  <xsd:restriction base="xsd:token">
    <xsd:enumeration value="ALGOSSIf" />
  </xsd:restriction>
</xsd:simpleType>

<!-- ***** -->

<!-- * Define interface ALGOSSIfMethodsType -->
<!-- ***** -->

<xsd:complexType name="ALGOSSIfMethodsType">
  <xsd:choice minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="changeMGGWCemData"
type="changeMGGWCemDataMethodType" />
    <xsd:element name="getALGData" type="getALGDataMethodType" />
    <xsd:element name="getAlgNamesbyGWCId"
type="getAlgNamesbyGWCIdMethodType" />

```

```
    </xsd:choice>
  </xsd:complexType>
</xsd:schema>
```

### Module : changemggwcemdata.xsd:

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

  <!-- ***** -->
  <!-- * Define GWCCConfiguration changeGateway Method Parameters -->
  <!-- ***** -->
  <xsd:complexType name="changeMGGWCEMDataMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="changeMGGWCEMDataParamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="changeMGGWCEMDataParamsType">
    <xsd:sequence>
      <xsd:element name="MGUIName" type="NoSpaceNameType" />
      <xsd:element name="algName" type="xsd:token" minOccurs="0" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>
```

### Module : getALGdata.xsd:

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

  <!-- ***** -->
  <!-- * Define GWCCConfiguration getALGByFilter Method Parameters -->
  <!-- ***** -->
  <xsd:complexType name="getALGDataMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="getALGDataType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="getALGDataType">
    <xsd:sequence>
      <xsd:element name="algName" type="NoSpaceNameType" />
    </xsd:sequence>
  </xsd:complexType>
```

```
</xsd:schema>
```

## Module : ALGcommon.xsd:

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >
  <!-- ***** -->
  <!-- ** Global Attribute Groups Used by all schemas -->
  <!-- ***** -->

  <!-- ***** -->
  <!-- * Define Common Usn_Version Attribute Group-->
  <!-- ***** -->
  <xsd:attributeGroup name="Usn_VersionAttrbGroup" >
    <xsd:attribute name="usn" type="xsd:integer" use="required" />
    <xsd:attribute name="version" type="xsd:decimal" default="1.0"
use="optional"/>
  </xsd:attributeGroup>
  <!-- ***** -->
  <!-- ** Global Complex Types Used by all schemas -->
  <!-- ***** -->
  <!-- ***** -->
  <!-- * Global Simple Types Used or Useable by all schemas follows: -->
  <!-- ***** -->
  <!-- ***** -->
  <!-- * Define No Space Name Type -->
  <!-- ***** -->
  <xsd:simpleType name="NoSpaceNameType">
    <xsd:restriction base="xsd:token">
      <xsd:minLength value="1" />
      <xsd:pattern value="\S{1,32}" />
    </xsd:restriction>
  </xsd:simpleType>
  <!-- ***** -->
  <!-- * Define IPAddressType-->
  <!-- ***** -->
  <xsd:simpleType name="IPAddressType">
    <xsd:restriction base="xsd:string">
      <xsd:pattern value="\d{1,3}.\d{1,3}.\d{1,3}.\d{1,3}" />
    </xsd:restriction>
  </xsd:simpleType>
  <!-- ***** -->
  <!-- * Define MGProtocolType-->
  <!-- ***** -->
  <xsd:simpleType name="MGProtocolType">
    <xsd:restriction base="xsd:integer">
      <xsd:minInclusive value="1" />
      <xsd:maxInclusive value="1" />
      <xsd:pattern value="\d{1}" />
    </xsd:restriction>
  </xsd:simpleType>
```

```

    </xsd:restriction>
</xsd:simpleType>
<!-- ***** -->
<!-- * Define GWCNameType-->
<!-- ***** -->
<xsd:simpleType name="GWCNameType">
  <xsd:restriction base="xsd:string">
    <xsd:pattern value="GWC-\d\d?\d?" />
  </xsd:restriction>
</xsd:simpleType>
<!-- ***** -->
<!-- * Define IpPortTypeType-->
<!-- ***** -->
<xsd:simpleType name="IPPortType">
  <xsd:restriction base="xsd:integer">
    <xsd:minInclusive value="0" />
    <xsd:maxInclusive value="65535" />
  </xsd:restriction>
</xsd:simpleType>
</xsd:schema>

```

### Module : getALGbygwcid.xsd:

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

  <!-- ***** -->
  <!-- * Define GWCConfiguration getAlgNamesbyGWCID Method Parameters -->
  <!-- ***** -->
  <xsd:complexType name="getAlgNamesbyGWCIdMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="getAlgNamesbyGWCIdType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="getAlgNamesbyGWCIdType">
    <xsd:sequence>
      <xsd:element name="GWC" type="GWCNameType" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

## 1.12 Appendix B: XML Commands: description of method parameters

### 1.12.1 Parameter definitions

- **encoding??**
- **version** - The version refers to the version of the method or operation - e.g., the changeALGMiddleboxNames operation may have version 1.0 and 2.0, where version 1.0 takes parameters X and Y and version 2.0 takes parms X, Y, and Z. TYPE *decimal*.
- **usn** - Unique Sequence Number. This parameter is introduced to facilitate sending multiple XML commands in one file. This parameter value will be used to match the responses with the requests. TYPE *integer*.
- **ReturnCode value**- A numeric value indicating the result of the attempted operation (see Table 3, for range and definitions of each possible value). TYPE *string*.
- **Return code text**- Appropriate text that describes the result of the operation. TYPE *string*.
- **ALGMiddleboxName1** - The Middlebox name(s) of the ALG node middlebox(es). TYPE *NoSpaceNameType*. (32 character token without spaces, see xsd definitions in Appendix A.

### 1.12.2 Method Parameters

Method parameters are defined below. Input data is mandatory except where indicated otherwise.

1. **AssocMG** - Method to associate a gateway to the CS2K. This method has the following NEW parameters: (only NEW ones described, see standard documentation for the other definitions).
  - Input data:
    - usn
    - version
    - ALGMiddleboxName (Optional, Cannot be included as well as pepServerName) - defines the ALG (optional) for this gateway.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.

2. **QueryMG** - Method that gets the gateway information from a CS2K. This method has the following NEW Output parameters: (only NEW ones described, see standard documentation for the other definitions):
  - Output data:
    - ALGMiddleboxName - defines the ALG Middlebox for this gateway.
    -
3. **changeALG**- Method that changes the ALG for a given gateway. This method has the following parameters:
  - Input data:
    - usn
    - version
    - MGname indicates the gateway that this change command is for.
    - ALGName - defines the new ALG name
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.

## ***Product = CS 2000 Management Tools***

### **A00007072--Third-party GW Interop pre-provisioning** ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAW

#### **1.2 Description**

Feature A0007072 will deliver end-point pre-provisioning capability in the Succession Element and Sub-element Manager (SESM) required for the third party GW inter-op with the Succession OAMP system.

This feature provides the following major functionalities:



- Ability to associate a third party large line GW with its GWC and assign a node in the CS2K Core based on a user specified frame and the unit numbers.
- Ability to pre-provision the GW end-points from the OSSGATE interface using XML.
- Ability to delete GW end-points from the OSSGATE interface using XML.
- Ability to query GW end-points from the OSSGATE interface using XML.
- Ability to export a query end-point XML output response as an add end-point input XML request.
- Ability to perform bulk provisioning using the Batch Provisioning Tool (bpt).
- Ability to view the output from all the above XML operations in a nicely formatted html.

### 1.3 Hardware Requirements or Dependencies

Not applicable.

### 1.4 Software Requirements or Dependencies

Not applicable.

### 1.5 Limitations and restrictions

- Only the XML based machine interface is provided for end-point provisioning of third party large line GWs.
- The change end-point command is not supported.

### 1.6 Interactions

This feature facilitates end-point provisioning of third party GWs. The end-point format is defined by the GW profile specified during the provisioning of the GW. The profile definitions are facilitated by the GW Profile feature, Activity A00007071.

The gateway end-points must be pre-provisioned before attempting to assign a service to these end-points.

### 1.7 Applicable customer facing sections

Fault Management

Logs \_\_N/A\_\_

Alarms \_\_N/A\_\_

Configuration

Data Schema \_\_X\_\_

|                                                 |         |
|-------------------------------------------------|---------|
| User Interface                                  | __X__   |
| Element Management                              | __N/A__ |
| Security                                        | __N/A__ |
| Service Order                                   | __N/A__ |
| Office Parameters                               | __N/A__ |
| Accounting (includes AMA billing)               | __N/A__ |
| Performance (includes operational measurements) | __N/A__ |

## 1.8 Glossary

| Term | Description              |
|------|--------------------------|
| GW   | GateWay                  |
| GWC  | GateWay Controller       |
| XML  | eXtended Markup Language |

## 2: Configuration for A00007072

### 2.1 Hardware and Software Requirements

SN08 base loads will be required across all the components of this solution to effectively use this feature.

### 2.2 Initial Configuration

Not applicable.

**Note:** A third party GW must have been successfully associated with its GWC using appropriate GW profile, before attempting the end-point provisioning. This feature makes use of this pre-condition to facilitate end-point provisioning of such a GW.

### 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

Not applicable.

**Note:** This feature leverages a previously defined gateway profile for third party large line gateways.

### 2.4 Upgrade Impact

#### 2.4.1 Dump and Restore

Not applicable.

## 2.4.2 Element Management Upgrade

Conversion of existing third party large line GW data to SN08 format is not supported. To leverage any of the capabilities delivered by this feature, the existing GW and the associated end-points and the Service must be removed and re-added in SN08. Both new and old format data will be allowed to co-exist in SN08, however the existing GW and the end-points will be managed in the same format as defined in the previous release.

Due to a dependency of this feature on the GW Profile Feature, A00007071, the capabilities provided by this feature cannot be fully utilized until all the components of the OAMP are at the base 08 load line up. There is a dependency on the new LGRPTYPE in the 08 CS2K Core that will be used by the third party GW nodes in the Core. The GWC devices are required to be on the 08 release as well to support spare profiles. Please refer to the A00007071 feature documentation for additional details regarding this dependency.

## 2.5 Data schema (DS) (CM, MIBS, RDB)

### 2.5.1 New/modified tables, MIBs, or Database Schema

Not Applicable.

## 2.6 Gateway and End-point Name Mapping to Logical Group and Line Equipment Number (LEN)

The logical group name is derived from the GW SITE, the frame number and the unit number. The end-point name is user defined and its associated LEN has absolutely no bearing on the end-point name. The LEN is derived from the logical group name and the user specified circuit number. The following sections clarify this relationship with an example.

### 2.6.1 GW

<GWNAME>, e.g. "MyGW"

#### 2.6.1.1 Logical Group

<SITE> <FFF> <U>, e.g. "CARY 142 0"  
where:

<SITE> = SITE name chosen at gateway provisioning time. Matching gateway name to SITE name is not an enforced rule, however it is suggested that a third party GW SITE name be defined in the CS2K Core and that all third party gateway provisioning utilize the "third party GW" SITE name.

<FFF> = Frame number that is specified during the third party GW provisioning. This number can range between 0 - 511.

<U> = Unit number that is specified during the third party GW provisioning. This number can range from 0 - 9.

### 2.6.1.2 End-point

The end-point name is flexible. The format of the name is defined during the GW profile creation time and enforced during the GW provisioning time. The name is completely user-defined. The name can include any physical location data of the hardware. The end-point name can be up to 32 characters long with no spaces in between.

### 2.6.1.3 LEN Format

<SITE> <FFF> <U> <TT> <tt>, e.g. "CARY 142 0 10 13"  
where:

<SITE>, <FFF>, <U>, <TT>, and <tt> are as defined in the above sections.

The following summarizes the correlation between a GW, its end-points and the associated LENs:

- One third party "GW" mapped to one logical group in the CS2K Core.
- 1023 terminations are supported per logical group.
- 1 terminal number is reserved in the CS2K Core for maintenance/messaging.

**Table 1 GW, LGRP, End-point, TN and LEN Relationship**

| GW Name<br>(User Input) | Profile | LGRP Name     | End-point<br>(User Input) | Circuit<br>Number (<br>User Input) | LEN              |
|-------------------------|---------|---------------|---------------------------|------------------------------------|------------------|
| MyGW.ext.net            | PRF_1   | CARY 100<br>5 | ext/100/5/1/1             | 0                                  | EXT 100 5 00 00  |
| MyGW.ext.net            | PRF_1   | CARY 100<br>5 | ext/100/5/1/2             | 2                                  | EXT 100 5 00 01  |
| :                       |         | :             | :                         | :                                  | :                |
| :                       |         | :             | :                         | :                                  | :                |
| MyGW2.ext.net           | PRF_2   | EXT2 200 8    | ext2-ep-last              | 1022                               | EXT2 200 8 10 22 |

Terminal number 0 is reserved in the CS2K Core for the maintenance/messaging terminal on the node.

LEN is generated using the following formula:

(LGRPName) (CN/100) (CN%100) where CN => Circuit Number

The last two parts of LEN are 0 padded to keep the value to 2 digits similar to the other LENs.

## 2.7 Service Orders (SO) (CM & SESM)

Not applicable.

## 2.8 Software optionality control (SOC)

Not applicable.

## 2.9 Element Management

### 2.9.1 New/modified GUIs

The CS2000 Management Tools GUI is modified by this feature. Specifically the ‘Associate Media Gateway’ dialog box will be altered to support provisioning of the frame and unit numbers and the LGRPLOC information as part of LGRPOPTS (LGRP OPTions).

A third party GW will be associated with its GWC using an appropriate gateway profile. The profile must have been defined before associating the GW. When the third party GW profile is selected on the “Associate Media Gateway” GUI, the new fields for taking the input for the frame and unit numbers along with the other LGRPLOC fields will be displayed.

**Table 2 New or modified GUIs**

| GUI name | NEW, CHANGED, or DELETED |
|----------|--------------------------|
| AssocMG  | CHANGED                  |

### 2.9.2 GUI information

#### 2.9.2.1 GUI name: AssocMG

“Associate Media Gateway”

##### 2.9.2.1.1 Functional description

The existing “Associate Media Gateway” GUI prompts the user for profile specific information based on the profile selection. For the third party gateways, there are additional parameters required to be gathered along with the SITE name. The new fields are for gathering the frame number, the unit number and the LGRP OPTION data. These new fields will be populated in the GUI based on the query of a specific field in the GW profile definition.

##### 2.9.2.1.2 GUI usage and implications

Current datafill order unchanged.

##### 2.9.2.1.3 GUI size

Not applicable.

#### 2.9.2.1.4 GUI fields

Two new fields are introduced as part of provisioning a third party gateway to successfully create a node in the CS2K core for the GW being added.

**Table 3 GUI field descriptions**

| Field      | New or Changed | Subfield       | Entry      | Explanation and action | Associated MIB entry |
|------------|----------------|----------------|------------|------------------------|----------------------|
| Frame Type | New            | Not applicable | User Input | Frame Type             | Not applicable       |
| Frame #    | New            | Not applicable | User Input | Frame Number           | Not applicable       |
| Unit #     | New            | Not applicable | User Input | Unit Number            | Not applicable       |
| Floor Pos  | New            | Not applicable | User Input | Floor Position         | Not applicable       |
| Row Pos    | New            | Not applicable | User Input | Row Position           | Not applicable       |
| Frame Pos  | New            | Not applicable | User Input | Frame Position         | Not applicable       |

#### 2.9.2.1.5 Usage example

Usage of the “Associate Media Gateway” GUI has not changed.

#### 2.9.2.1.6 GUI release history update

Not applicable.

#### 2.9.2.1.7 Supplementary information

None.

### 2.9.3 CLUI Interface

There are 3 sub-sections in this component. One of them is the XML interface for providing the end-point provisioning and the other component includes the Batch Provisioning Tool (BPT) enhancements to support bulk provisioning of end-points. These are discussed in detail in the following sections:

#### 2.9.3.1 XML interface for GW provisioning:

The XML interface, for the Associate MG XML command in Nodes Provisioning facilitates, provisioning the LGRPLOC information including the frame and the unit number data in the input XMLs for this command.

Please see later sections for the corresponding schema definitions (XSDs) and the XML document templates.

### 2.9.3.2 XML interface for end-point provisioning:

The end-point pre-provisioning is achieved by using XML from the OSSGATE interface similar to Nodes Provisioning.

The following are the supported XML commands:

1. addLineEndpoint
2. delLineEndpoint
3. queryLineEndpoint
4. queryAllLineEndpoints

The above mentioned XML commands are the OSS interfaces supported by this feature. A brief description of each one of these interfaces, including input parameters and possible output parameters are listed below.

A brief description of the common parameters used across these different commands:

- **mgUIName** - fully qualified gateway name. This can be 1 - 32 characters long. TYPE *string*.
- **endpointName** - name of the end-point that is being provisioned. This can be 1 - 32 characters long. TYPE *string*.
- **circuitNumber** - number to associate the terminal with. The range of this value is 0 - 1022. TYPE *unsignedShort*
- **cardCode** - string that defines the card code associated with the card. TYPE *string*. Optional parameter. The default is RDLSG.
- **padGroup** - string that defines the pad group. TYPE *string*. Optional parameter. The default is PKLNL.
- **ground** - string that defines the ground property. TYPE *string*. Values can be “N” or “Y”. Optional parameter. The default is “N”.
- **version** - the version refers to the version of the method or operation - e.g., the AddSubscriber operation may have version 1.0 and 2.0, where version 1.0 takes parameters X and Y and version 2.0 takes parameters X, Y, and Z. TYPE *decimal*.
- **usn** - unique Sequence Number. This parameter is introduced to facilitate sending multiple XML commands in one file. This parameter value will be used to match the responses with the requests. TYPE *integer*.
- **RC** - return Code. A numeric value indicating the result of the attempted operation (see Table 3, above for range and definitions of each possible value). TYPE *short*.
- **MsgTxt** - appropriate text that describes the result of the operation. TYPE *string*.

Individual XML document structure for each of the end-point provisioning commands is described in the following sections:

**addLineEndpoint** - interface/method that adds a specified end-point to the SESM database and allocates a LEN to the corresponding terminal in the CS2K core.

- Input data:
  - usn
  - version
  - mgUIName
  - endpointName
  - cardCode - Default: RDTEBS
  - padGroup - Default: STDLN
  - ground - Default: N
- Output data:
  - usn (the value should be the same as the input)
  - version (the value should be the same as the input)
  - RC - Return Code
  - MsgTxt - text data detailing specific results of the operation in terms of the success or failure of the operation and the possible indication of the failure reason in case of a failure.

**delLineEndpoint** - interface/method that deletes a specified end-point from the SESM database and de-allocates LEN from the corresponding terminal in the CS2K core.

**Pre-condition:** service on the end-point must be un-assigned before attempting this operation.

- Input data:
    - usn
    - version
    - mgUIName
    - endpointName
- OR
- to delete a bunch of end-points with a specified range of circuit numbers:
- circuitNumberBegin



- circuitNumberEnd

OR

to delete ALL the end-points on this GW:

- ALL

- Output data:

- usn (the value should be the same as the input)
- version (the value should be the same as the input)
- RC - Return Code
- MsgTxt - text data detailing specific results of the operation in terms of the success or failure of the operation and the possible indication of the failure reason in case of a failure.

**queryLineEndpoint** - interface/method that queries a specific end-point data on this gateway.

The end-point data will be enclosed within the <Row> tags similar to the output of the other nodes XML operations.

- Input data:

- usn
- version
- mgUIName
- endpointName

- Output data:

- usn (the value should be the same as the input)
- version (the value should be the same as the input)
- usn (the value should be the same as the input)
- version (the value should be the same as the input)
- mgUIName
- endpointName
- CircuitNumber
- cardCode
- padGroup
- status
- ground
- status

- tid
- LEN
- RC - Return Code
- MsgTxt - text data detailing specific results of the operation in terms of the success or failure of the operation and the possible indication of the failure reason in case of a failure.

**queryAllLineEndpoints** - interface/method that queries all the end-points on this gateway.

The end-point data for each of the end-points will be enclosed within the <Row> tags similar to the output of the other nodes XML operations.

- Input data:
  - usn
  - version
  - mgUIName
- Output data:
  - usn (the value should be the same as the input)
  - version (the value should be the same as the input)
  - mgUIName
  - endpointName
  - CircuitNumber
  - cardCode
  - padGroup
  - status
  - ground
  - status
  - tid
  - LEN
  - RC - Return Code
  - MsgTxt - text data detailing specific results of the operation in terms of the success or failure of the operation and the possible indication of the failure reason in case of a failure.

### 2.9.3.2.1 XML - Example Commands and Responses

#### Introduction:

The end-point pre-provisioning capability is provided using the OSSGate interface with XML documents. This application takes XML based command files as input and returns XML formatted response messages. (See [www.w3.org](http://www.w3.org) for more information on XML.)

OSSGate accepts client connections and forwards incoming XML input to the pre-provisioning application. The XML commands are parsed, processed, and the appropriate response is returned to the client.

The following format is the general file format for a valid XML input file:

**Table 4 XML File Format**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <someMethod usn="1" version="1.0">
        <Parameters>
          <fieldName>somevalue</fieldName>
          <fieldName>somevalue</fieldName>
        </Parameters>
      </someMethod>
      <someMethod usn="2" version="1.0">
        <Parameters>
          <fieldName>somevalue</fieldName>
          <fieldName>somevalue</fieldName>
        </Parameters>
      </someMethod></Methods>
    </Command>
  </CommandList>
```

Response to XML commands are returned in the XML formatted response documents. The following format is the general file format for a valid XML response file:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Response>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <someMethod usn="1" version="1.0">
        <ReturnData>
          <fieldName>somevalue</fieldName>
          <RC>somevalue</RC>
          <MsgTxt>somevalue</MsgTxt>
        </ReturnData>
      </someMethod>
    </Methods>
  </Response>
</CommandList>
```

A few important guidelines for valid XML documents are:

- For every open tag there must be a close tag.
- Every attribute value must be quoted, either with single or double quotes, but they must be consistent.
- No attribute name may appear more than once in a single element.
- Elements must be nested (closed) properly.
- Only one root element is allowed.
- XML is case-sensitive.
- The document must conform to the rules defined in the XML schema file (XSD file). Please see later sections towards the end of this document for details on the individual XSD documents.

### 2.9.3.2.2 Examples of the pre-provisioning XMLs

The following are few examples of the end-point pre-provisioning commands for each operation supported by this activity. The XML messages in these examples are formatted for the ease of understanding.

#### **addLineEndpoint Command:**

Example of an **addLineEndpoint** XML request:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <addLineEndpoint usn="1" version="1.0">
        <Parameters>
          <mgUIName>MYMG000-0-1</mgUIName>
          <endpointName>aaln/1/2</endpointName>
          <circuitNumber>1</circuitNumber>
          <cardCode>RDTLSG</cardCode>
          <padGroup>PKLNL</padGroup>
        </Parameters>
      </addLineEndpoint>
    </Methods>
  </Command>
</CommandList>
```

#### **delLineEndpoint XML Command:**

Example of a **delLineEndpoint** XML request:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <delLineEndpoint usn="1" version="1.0">
        <Parameters>
          <mgUIName>MYMG000-0-1</mgUIName>
          <endpointName>aaln/1/2</endpointName>
        </Parameters>
      </delLineEndpoint>
    </Methods>
  </Command>
</CommandList>
```

An example of a **delLineEndpoint** request for deleting **a range** of end-points (with circuit numbers ranging from 2 - 10 with limits inclusive) of this gateway:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <delLineEndpoint usn="1" version="1.0">
        <Parameters>
          <mgUIName>MYMG000-0-1</mgUIName>
          <circuitNumberBegin>2</circuitNumberBegin>
          <circuitNumberEnd>10</circuitNumberEnd>
        </Parameters>
      </delLineEndpoint>
    </Methods>
  </Command>
</CommandList>
```

An example of a **delLineEndpoint** request for deleting **ALL** the end-point of this gateway:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <delLineEndpoint usn="1" version="1.0">
        <Parameters>
          <mgUIName>MYMG000-0-1</mgUIName>
        </Parameters>
      </delLineEndpoint>
    </Methods>
  </Command>
</CommandList>
```

**queryLineEndpoint XML Command:**

An example of a **queryLineEndpoint** XML request:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <queryLineEndpoint usn="1" version="1.0">
        <Parameters>
          <mgUIName>MYMG000-0-1</mgUIName>
          <endpointName>aaln/1/2</endpointName>
        </Parameters>
      </queryLineEndpoint>
    </Methods>
  </Command>
</CommandList>
```

An example of a **qryAllLineEndpoints** request for querying **ALL** the endpoint of this gateway:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <queryAllLineEndpoints usn="1" version="1.0">
        <Parameters>
          <mgUIName>MYMG000-0-1</mgUIName>
        </Parameters>
      </queryAllLineEndpoints>
    </Methods>
  </Command>
</CommandList>
```

**2.9.3.2.3 Examples of Response XMLs:**

**addLineEndpoint Response with 4 commands:**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
<Response>
<Interface>cs2kCfgMgrIf</Interface>
<Methods>
  <addLineEndpoint usn="1" version="1.0">
    <ReturnData>
      <RC>18</RC>
      <MsgTxt>The MG service type is not supported by the GWC.</MsgTxt>
    </ReturnData>
  </addLineEndpoint>
  <addLineEndpoint usn="2" version="1.0">
    <ReturnData>
      <RC>18</RC>
      <MsgTxt>The MG service type is not supported by the GWC.</MsgTxt>
    </ReturnData>
  </addLineEndpoint>
  <addLineEndpoint usn="3" version="1.0">
    <ReturnData>
      <RC>18</RC>
      <MsgTxt>The MG service type is not supported by the GWC.</MsgTxt>
    </ReturnData>
  </addLineEndpoint>
  <addLineEndpoint usn="4" version="1.0">
    <ReturnData>
      <RC>18</RC>
      <MsgTxt>The MG service type is not supported by the GWC.</MsgTxt>
    </ReturnData>
  </addLineEndpoint>
</Methods>
</Response>
</CommandList>
```

### **delLineEndpoint XML Response:**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
<Response>
<Interface>cs2kCfgMgrIf</Interface>
<Methods>
  <delLineEndpoint usn="1" version="1.0">
    <ReturnData>
      <RC>18</RC>
      <MsgTxt>Delete Failed </MsgTxt>
    </ReturnData>
  </delLineEndpoint>
</Methods>
</Response>
</CommandList>
```

### **queryLineEndpoint XML Response:**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
<Response>
<Interface>cs2kCfgMgrIf</Interface>
<Methods>
  <queryLineEndpoint usn="1" version="1.0">
    <ReturnData>
      <mgUIName>myMG.usa.net</mgUIName>
      <Row>
        <endpointName>first/ep</endpointName>
        <circuitNumber>1010</circuitNumber>
        <cardCode>RDTLSG</cardCode>
        <padGroup>PKLNL</padGroup>
        <ground>N</ground>
        <status>HASU</status>
        <tid>1011</tid>
        <LEN>CARY 111 2 10 10</LEN>
      </Row>
      <RC>0</RC>
      <MsgTxt>Query Single Endpoint Successful</MsgTxt>
    </ReturnData>
  </queryLineEndpoint>
</Methods>
</Response>
</CommandList>
```

**queryAllLineEndpoints XML Response:**



```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
<Response>
<Interface>cs2kCfgMgrIf</Interface>
<Methods>
<queryAllLineEndpoints usn="1" version="1.0">
<ReturnData>
  <mgUIName>thirdParty.us.com</mgUIName>
  <Row>
    <endpointName>first/ep</endpointName>
    <circuitNumber>1010</circuitNumber>
    <cardCode>RDTLSG</cardCode>
    <padGroup>PKLNL</padGroup>
    <ground>N</ground>
    <status>HASU</status>
    <tid>1011</tid>
    <LEN>CARY 111 2 10 10</LEN>
  </Row>
  <Row>
    <endpointName>second/ep</endpointName>
    <circuitNumber>1011</circuitNumber>
    <cardCode>RDTLSG</cardCode>
    <padGroup>PKLNL</padGroup>
    <ground>Y</ground>
    <status>WORKING</status>
    <tid>1012</tid>
    <LEN>CARY 111 2 10 10</LEN>
  </Row>
  <RC>0</RC>
  <MsgTxt>Query endpoints operation successful</MsgTxt>
</ReturnData>
</queryAllLineEndpoints>
</Methods>
</Response>
</CommandList>
```

**assocmg XML Command:**

Example of a **assocmg** XML request:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <assocMG usn="1" version="1.0">
        <Parameters>
          <mgUIName>MyGW.ext.net</mgUIName>
          <mgProfileName>THIRD_PARTY</mgProfileName>
          <mgIpAddr>47.171.3.44</mgIpAddr>
          <mgProtocolPort>2427</mgProtocolPort>
          <gwcUIName>GWC-2</gwcUIName>
          <lgrpLocation>
            <frameType>ABCD</frameType>
            <frameNumber>5</frameNumber>
            <unitNumber>8</unitNumber>
            <floorPosition>10</floorPosition>
            <rowPosition>SS</rowPosition>
            <framePosition>44</framePosition>
          </lgrpLocation>
        </Parameters>
      </assocMG>
    </Methods>
  </Command>
</CommandList>
```

#### 2.9.3.2.4 XML Schema Language (XSD)

XML schemas validate each incoming XML request and ensure that the instance document follows the required content model and the parameters are valid before sending the provisioning request down to the server.

#### addLineEndpoint.xsd:

```
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

  <!-- ***** -->
  <!-- * Define Method Parameters -->
  <!-- ***** -->
  <xsd:complexType name="addLineEndpointMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="addLineEndpointParamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="addLineEndpointParamsType">
    <xsd:sequence>
      <xsd:element name="mgUIName" type="NoSpaceNameType" />
      <xsd:element name="endpointName" type="NoSpaceNameType" />
      <xsd:element name="circuitNumber" type="CircuitNumberType" minOccurs="0" />
      <xsd:element name="cardCode" type="xsd:token" default="RDTLSG"
minOccurs="0" />
      <xsd:element name="padGroup" type="xsd:token" default="PKLNL"
```

```

minOccurs="0" />
      <xsd:element name="ground" type="xsd:string" default="N"
minOccurs="0" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

## delLineEndpoint.xsd

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

  <!-- ***** -->
  <!-- * Define Method Parameters -->
  <!-- ***** -->
  <xsd:complexType name="delLineEndpointMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="delLineEndpointParamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="delLineEndpointParamsType">
    <xsd:sequence>
      <xsd:element name="mgUIName" type="NoSpaceNameType" />
      <xsd:choice minOccurs="0">
        <xsd:element name="endpointName" type="NoSpaceNameType" />
        <xsd:sequence>
          <xsd:element name="circuitNumberBegin" type="CircuitNumberType" />
          <xsd:element name="circuitNumberEnd" type="CircuitNumberType" />
        </xsd:sequence>
      </xsd:choice>
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

## queryLineEndpoint.xsd

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >

  <!-- ***** -->
  <!-- * Define Method Parameters -->
  <!-- ***** -->
  <xsd:complexType name="queryLineEndpointMethodType">
    <xsd:all>
      <xsd:element name="Parameters" type="queryLineEndpointParamsType" />
    </xsd:all>
    <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
  </xsd:complexType>
  <xsd:complexType name="queryLineEndpointParamsType">
    <xsd:sequence>
      <xsd:element name="mgUIName" type="NoSpaceNameType" />
      <xsd:element name="endpointName" type="NoSpaceNameType" />
    </xsd:sequence>
  </xsd:complexType>
</xsd:schema>

```

**queryAllLineEndpoints.xsd**

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

<!-- ***** -->
<!-- * Define Method Parameters -->
<!-- ***** -->
<xsd:complexType name="queryAllLineEndpointsMethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="queryAllLineEndpointsParamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="queryAllLineEndpointsParamsType">
  <xsd:sequence>
    <xsd:element name="mgUIName" type="NoSpaceNameType" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>

```

**assomg.xsd:**

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
            version="1.0"
            xml:lang="en" >

<!-- ***** -->
<!-- * Define AssocMG Method Parameters -->
<!-- ***** -->
<xsd:complexType name="assocMGMethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="assocMGParamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="assocMGParamsType">
  <xsd:sequence>
    <xsd:element name="mgUIName" type="NoSpaceNameType" />
    <xsd:element name="mgProfileName" type="NoSpaceNameType" />
    <xsd:element name="mgIpAddr" type="IPAddressType" />
  </xsd:sequence>
  <xsd:element name="mgProtocolPort" type="xsd:unsignedShort" />
  <xsd:element name="mgSiteName" type="MGSiteNameType" minOccurs="0" />
  <xsd:element name="gwcUIName" type="GWCNameType" minOccurs="0" />
  <xsd:element name="reservedTerminations" type="ReservedTerminationsType"
minOccurs="0" />
    <xsd:element name="lgrpLocation" type="LGRPLocationType" minOccurs="0"
/>
    <xsd:choice minOccurs="0">
      <xsd:element name="pepServerName" type="xsd:token" />
      <xsd:element name="itransMiddleboxName" type="xsd:token" />
      <xsd:element name="rootMiddleboxName1" type="NoSpaceNameType" />
    </xsd:choice>
    <xsd:element name="rootMiddleboxName2" type="NoSpaceNameType"
minOccurs="0" />
    <xsd:element name="rootMiddleboxName3" type="NoSpaceNameType"
minOccurs="0" />
    <xsd:element name="rootMiddleboxName4" type="NoSpaceNameType"
minOccurs="0" />
    <xsd:element name="rootMiddleboxName5" type="NoSpaceNameType"

```

```

minOccurs="0" />
  </xsd:sequence>
</xsd:complexType>
</xsd:schema>

```

## cs2cfgbase.xsd:

**Note:** Only updates are shown here, the previous content will be left unchanged.

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  version="1.0"
  xml:lang="en" >
  <xsd:include schemaLocation="snbase.xsd"/>
  <xsd:include schemaLocation="assocmg.xsd"/>
  <xsd:include schemaLocation="addLineEndpoint.xsd"/>
  <xsd:include schemaLocation="delLineEndpoint.xsd"/>
  <xsd:include schemaLocation="queryLineEndpoint.xsd"/>
  <xsd:include schemaLocation="queryAllLineEndpoints.xsd"/>

  <!--
  *****
  ***** -->
  <!-- ** Define Parser Convention Required elements -->
  <!-- ** These are CommandList (root element), Comand, Interface, Methods -->
  <!--
  *****
  ***** -->
  <xsd:element name="CommandList" >
    <xsd:complexType >
      <xsd:sequence>
        <xsd:element name="Command" type="CommandType" />
      </xsd:sequence>
    </xsd:complexType >
  </xsd:element>

  <!-- Define CommandType -->
  <xsd:complexType name="CommandType">
    <xsd:sequence>
      <xsd:element name="Interface" type="cs2kCfgMgrIfType"/>
      <xsd:element name="Methods" type="cs2kCfgMgrIfMethodsType" />
    </xsd:sequence>
  </xsd:complexType>

  <!--
  *****
  ***** -->
  <!-- ** Define cs2kCfgMgrIfType -->
  <!--
  *****
  ***** -->

  <!-- cs2kCfgMgrIfType -->
  <xsd:simpleType name="cs2kCfgMgrIfType">
    <xsd:restriction base="xsd:token">
      <xsd:enumeration value="cs2kCfgMgrIf" />
    </xsd:restriction>
  </xsd:simpleType>

```

```
<!-- ***** -->
<!-- * Define interface cs2kCfgMgrIfMethods -->
<!-- ***** -->
<xsd:complexType name="cs2kCfgMgrIfMethodsType">
  <xsd:choice minOccurs="1" maxOccurs="unbounded">
    <xsd:element name="assocMG" type="assocMGMethodType" />

    <xsd:element name="addLineEndpoint" type="addLineEndpointMethodType" />
  <!-- NEW -->
    <xsd:element name="delLineEndpoint" type="delLineEndpointMethodType" />
  <!-- NEW -->
    <xsd:element name="queryLineEndpoint" type="queryLineEndpointMethodType" />
  <!-- NEW -->
    <xsd:element name="queryAllLineEndpoints" type="queryAllLineEndpointsMethodType" />
  <!-- NEW -->
  </xsd:choice>
</xsd:complexType>

<!-- ***** -->
<!-- * Define FrameNumberType -->
<!-- ***** -->
<xsd:simpleType name="FrameNumberType">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0" />
    <xsd:maxInclusive value="511" />
  </xsd:restriction>
</xsd:simpleType>

<!-- ***** -->
<!-- * Define UnitNumberType -->
<!-- ***** -->
<xsd:simpleType name="UnitNumberType">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0" />
    <xsd:maxInclusive value="9" />
  </xsd:restriction>
</xsd:simpleType>

<!-- ***** -->
<!-- * Define CircuitNumberType -->
<!-- ***** -->
<xsd:simpleType name="CircuitNumberType">
  <xsd:restriction base="xsd:unsignedShort">
    <xsd:minInclusive value="0" />
    <xsd:maxInclusive value="1022" />
  </xsd:restriction>
```

```

</xsd:simpleType>

<!-- *****
-->
<!-- * Define LGRPLocType-->
<!-- *****
-->
<xsd:complexType name="LGRPLocationType">
  <xsd:all>
    <xsd:element name="frameType" type="xsd:string" minOccurs="0"/>
    <xsd:element name="frameNumber" type="FrameNumberType"/>
    <xsd:element name="unitNumber" type="UnitNumberType" />
    <xsd:element name="floorPosition" type="xsd:unsignedShort"
minOccurs="0"/>
    <xsd:element name="rowPosition" type="xsd:string" minOccurs="0"/>
    <xsd:element name="framePosition" type="xsd:unsignedShort"
minOccurs="0"/>
  </xsd:all>
</xsd:complexType>

</xsd:schema>

```

### 2.9.3.3 Batch Provisioning Tool (bpt):

The SESM application, 'bpt', is a command line tool that provides an ability to perform bulk provisioning. Enhancements to this tool include new menu options to facilitate end-point bulk provisioning and a new option to facilitate converting query end-point operation output into add end-point operation input.

In addition, the 'bpt' help text will be updated to include the new enhancements. The 'bpt' menus are enhanced as follows:

```
=====
```

*Batch Provisioning Tool (BPT V1.0)*

```
=====
```

*Username: ptm*

*Password:*

*Login in progress ...*

*You are currently logged in as: ptm*

```
=====
```

*Main Menu:*

=====

- (1) Execute Batch File
- (2) Display Output
- (3) Display Logs
- (4) Delete Output or Log Files
- (h) Help
- (x) Exit

*Selection: [1/2/3/4/h/x:1] 1*

=====

*Provisioning Input Entry Menu:*

=====

*Coming from this menu:*

- (1) Lines
- (2) ADSL
- (3) Line Endpoints**
- (4) Go to shell prompt
- (r) Return to the main menu.
- (x) Exit BPT.

*Selection: [1/2/3/4/r/x:1] 3*

=====

*Line Endpoints Sub-Menu:*

=====

- (1) Line Endpoints
- (2) Export queryLineEndpoints Output
- (b) Back to the previous menu
- (r) Return to the main menu



(x) *Exit BPT.*

*Selection: [1/2/b/r/x:1] 1*

*Which mode would you like to have the log file on?*

*Critical/Verbose/Major/Minor [c/v/ma/mi:c]:c*

*Please enter the input file name:*

For the “export” command (option 4 on the ‘Provisioning Input Entry Menu’), the generated output XML file name will be auto-generated and (in a format for addLineEndpoint XML command) will be available on the SESM Server at the following location:

*/opt/nortel/NTsesm/tools/bpt/output/export*

The line endpoints menu will be integrated into the other menus of bpt for managing the output files and the log files. For example, the following are the output snapshots:

***For output file management:***

=====

Main Menu:

=====

- (1) Execute Batch File
- (2) Display Output
- (3) Display Logs
- (4) Delete Output or Log Files
- (h) Help
- (x) Exit

*Selection: [1/2/3/4/h/x:1] 2*

=====

Display Output Menu:

=====

Coming from this menu: output

(1) Lines

(2) ADSL

(3) Line Endpoints

(4) Go to shell prompt

(r) Return to the main menu.

(x) Exit BPT.

Selection: [1/2/3/4/r/x:1] 3

=====

Line Endpoints Sub-Menu:

=====

(1) Line Endpoints

(2) Export queryLineEndpoints Output

(b) Back to the previous menu

(r) Return to the main menu

(x) Exit BPT.

Selection: [1/2/b/r/x:1] 1

The following files are listed in the output directory:

test.xml

Please enter the file name (or press 'Enter' to go to the previous menu):

***For Log file management:***

=====

Main Menu:

=====

(1) Execute Batch File

- (2) Display Output
- (3) Display Logs
- (4) Delete Output or Log Files
- (h) Help
- (x) Exit

Selection: [1/2/3/4/h/x:1] 3

=====

Display Log File Menu:

=====

- (1) Lines
  - (2) ADSL
  - (3) Line Endpoints
  - (4) Go to shell prompt
  - (r) Return to the main menu.
  - (x) Exit BPT.

Selection: [1/2/3/4/r/x:1] 3

***For deleting output or log files:***

=====

Main Menu:

=====

- (1) Execute Batch File
  - (2) Display Output
  - (3) Display Logs
  - (4) Delete Output or Log Files
  - (h) Help

(x) Exit

Selection: [1/2/3/4/h/x:1] 4

=====

Delete Files Menu:

=====

Coming from this menu: del

(1) Lines

(2) ADSL

(3) Line Endpoints

(4) Go to shell prompt

(r) Return to the main menu.

(x) Exit BPT.

Selection: [1/2/3/4/r/x:1] 3

Going to show Line EP Sub-menu

The input parm is dollar 1: del

=====

Line Endpoints Sub-Menu:

=====

(1) Line Endpoints

(2) Export queryLineEndpoints Output

(b) Back to the previous menu

(r) Return to the main menu

(x) Exit BPT.

Selection: [1/2/b/r/x:1]

## 2.10 Command interface changes

Not applicable.

## 2.11 Security

Authorization is supported based on the user privileges similar to other Nodes-related operations. All the end-point pre-provisioning XML commands are allowed to be performed *only if the logged-in user is successfully authorized for that particular operation*. Each operation requires a level of authorization and the user has to belong to a specific group that has the required access rights or to a higher group in the hierarchy of the defined groups.

Here is the mapping of each of the XML command to the required permissions:

addLineEndpoint=nortel.mgc.iprov

delLineEndpoint=nortel.mgc.iprov

qryLineEndpoint=nortel.mgc.ro

All the successful authorization attempts will be logged to the audit log located in the /var/log directory on the SESM server.

All the authorization failures will be logged to the security log located in the /var/log directory on the SESM server.

### 2.11.1 Network configuration

Not applicable.

### 2.11.2 Key management

Not applicable.

### 2.11.3 Protocol

Not applicable.

### 2.11.4 Authentication

Not impacted. Same authentication to login to the SESM GUI is applicable.

## 2.12 Configuration Walkthrough

The general order of provisioning is as follows:

- Provision table SITE in the CS2K core. SITE values for third party gateways should be restricted for use for this type of gateway.
- Provision table PADDATA in CS2K core (PKLNL and PKNIL entries).
- Provision the third party gateway in SESM (auto-creates the LGRPINV entry).

- Configure the gateway at its EM, if needed.
- Pre-provision the GW end-points from OSSGATE (auto-creates the LNINV entry)
- Execute the SERVORD+ commands via the OSSGate (the service is assigned to the LENS in LNINV).

## ***Product = CS 2000 Management Tools***

### **A00007242--SESM support for SPC topology**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAW, IAC, CHS

#### **1.2 Description**

In SN08, a new succession component, the SPC (Session Policy Controller) is being introduced. Its purpose is to provide the capability to apply policies during call-processing, e.g. policy-based codec selection, connection admission control etc. In general the policy may be implemented on the SPC itself, or (in the future) the SPC may communicate with other devices, such as intelligent middleboxes, in order to apply the policy.

In SN08, the SPC will support exactly one policy, that of Network Resource Reservation, using Virtual Connection Admission Control (VCAC) as the enforcement mechanism. Hence counting of available resource across Limited Bandwidth Links (LBLs) and connection admission decisions will be carried out on the SPC, instead of being done on the GWCs as in SN07 (SN07 feature A00002512). The SN08 GWCs communicate with the SPC to determine whether a call can be set-up. This will allow LBLs to be shared across different GWCs.

The SPC will reside on the NGSS platform. In SN08, the SPC encompasses a Topology Server application. In order to carry out VCAC, middlebox/zone topology information must be provisioned both into the SESM and into the SPC's Topology Server. The network configuration is shown in figure 1.

The SPC (Topology Server) will not communicate directly with the SESM. In addition there is no Succession flow-through provisioning interface to both systems. Hence the user (i.e. OSS/GUI user) is responsible for provisioning identical NAT and LBL topology information into both the SESM and the

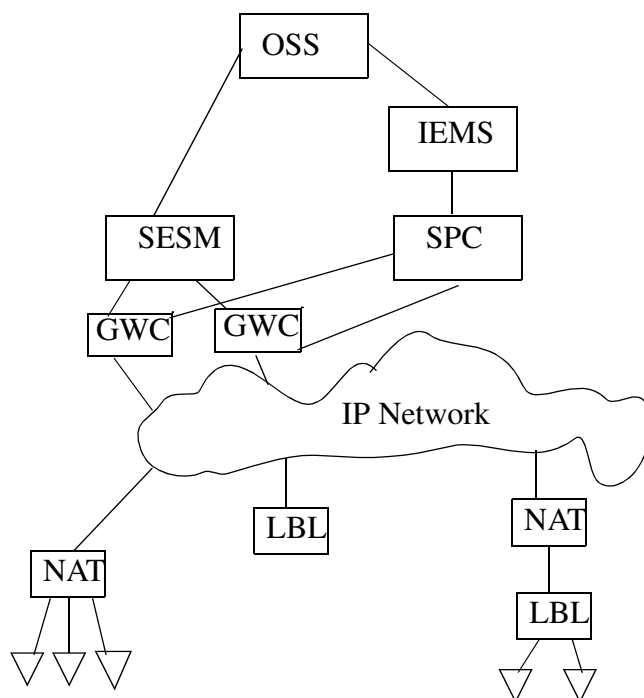
SPC. If identical information is not input into the two systems, VCAC may not work correctly.

For the GUI interface, the user should provision the information first into SESM and then into the SPC. It is important that the information is provisioned in the same order into each system. In particular, adding/deleting NATs & LBLs should be carried out identically in both systems. For example this could be achieved by adding an LBL to SESM and then to SPC, followed by adding the next LBL to SESM and then the SPC etc.

Hence in SN08, feature ACTID A00007242 covers the modifications required in SESM to integrate with the SPC and to provide provisioning for GWCs which support external counting. The resulting functional changes/additions are described in this document.

- Related activities are:
- ACTID A00007398\_SPC\_Topology\_Manager
- GWC modifications for provisioning for external counting

**Figure 1 SN08 Network Configuration with SPC**



The user operations provided by this feature which affect the GUI client are:

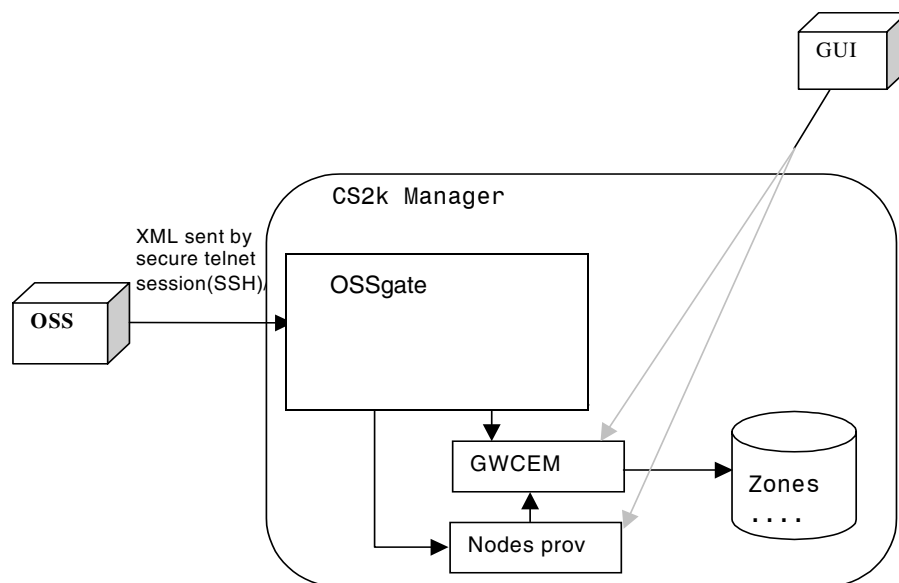
- Provide new GUI to set/change SPC parameters:

- SPC name
- SPC IP address

If there is only one supported protocol type and version in SN08 then these will be selected by default and the selections disabled.

- Provide new GUI to set Network VCAC on/off. If Network VCAC is set to 'on' (this requires an SPC to be provisioned), a warning message is provided indicating that:
  - VCAC counting will now be done on the SPC
  - all GWCs and XA-core should be at version SN08 (or above)
  - Reversion to internal counting ('Basic VCAC') is provided on a best effort basis
- Modifications to the existing GWCEM GUI as follows:
  - NAT and LBL panels will be situated on a new 'Network Zones' tab
  - It will be possible to provision (add/change/delete) a Network Zone which contains a NAT and an LBL. These Zones will be displayed on a new composite 'NAT & LBL' panel on the new 'Network Zones' tab
  - VCAC counting will now be done on the SPC
  - all GWCs and XA-core should be at version SN08 (or above)
  - Reversion to internal counting ('Basic VCAC') is provided on a best effort basis

**Figure 2 GUI Client and OSSGate interfaces**







### 1.3 Hardware Requirements or Dependencies

No new hardware is required or introduced by this feature. The application components provided by this feature execute as part of the SESM.

### 1.4 Software Requirements or Dependencies

Dependencies:

- CR.xxx: Extend Gateway Controller to support SPC provisioning and Network VCAC

### 1.5 Limitations and restrictions

- No MCS in SN08, but will be required in future releases
- Only one SPC per CS2k in SN08, but may be more in future releases
- VCAC will be supported with SPC and without SPC.
- There will be no provisioning connection between SPC and SESM in SN08. All topology information must be provisioned first into SESM and then into the SPC.
- Topology data transfer from SESM to SPC when SPC is commissioned will be done manually using existing SESM GUI/OSS interfaces and minor interface enhancements to support bulk query of topology data. Automatic bulk data transfer from SESM to SPC will NOT be provided.
- SESM will not provide an 'undo' capability to the GUI/OSS user.
- In order to facilitate the flow-through provisioning function carried out by the OSS, each SPC command must map to the same SESM command.
- Centralized authentication of passwords is not provided by base platform.
- SPC will not co-reside with any other NGSS based application.
- Bandwidth on-demand requests are incompatible with VCAC solution.
- Upgrade to SN08 should be carried out as described in and limitations on operation of VCAC during upgrade as described there will apply.
- Once Network VCAC is switched on, the SESM will remove any topology provisioning constraint checks which apply to Basic VCAC (internal counting). If Network VCAC is subsequently switched off, the internal counting checks will NOT be restored. It is not recommend to switch Network VCAC off once it has been switched on. Also, if it is switched off, Basic VCAC will only work correctly if the topology still meets the Basic VCAC/'internal counting' topology constraints. In normal use it is expected that Network VCAC will be switched on as soon as the upgrade and soak process is complete and SPC commissioned and will not be switched off.

## 1.6 Interactions

The following existing GUIs have been modified:

- Network Devices Panel
- Network Devices Panel, NATs tab.
- Network Devices Panel, LBLs tab.
- Add/change/delete NAT Dialogs
- Add/change/delete LBL dialogs
- change adjacent MB dialogs
- change root mb dialogs

The following GUIs have been added:

- SPC provisioning network panel.
- Add/change/delete SPC dialogs
- Network Zone tabbed Panel
- Composite NAT/LBL zone tabbed Panel
- Add/change/delete composite NAT/LBL zone dialogs

The following XML commands have been added:

- Add/change/delete/query Network Zone

The on-line help facility will be updated with information on the use, syntax and valid values for all the above modifications/additions.

## 1.7 Applicable customer facing sections

### Fault Management

|      |       |
|------|-------|
| Logs | _N/A_ |
|------|-------|

|        |       |
|--------|-------|
| Alarms | _N/A_ |
|--------|-------|

### Configuration

|             |     |
|-------------|-----|
| Data Schema | _X_ |
|-------------|-----|

|                |     |
|----------------|-----|
| User Interface | _X_ |
|----------------|-----|

|                    |       |
|--------------------|-------|
| Element Management | _N/A_ |
|--------------------|-------|

|          |       |
|----------|-------|
| Security | _N/A_ |
|----------|-------|

|               |       |
|---------------|-------|
| Service Order | _N/A_ |
|---------------|-------|

|                   |       |
|-------------------|-------|
| Office Parameters | _N/A_ |
|-------------------|-------|

|                                   |       |
|-----------------------------------|-------|
| Accounting (includes AMA billing) | _N/A_ |
|-----------------------------------|-------|

Performance (includes operational measurements) \_N/A\_

## 1.8 SPC Provisioning (including Network VCAC)

The General Network Settings display and change dialog will be modified to include a new panel which will allow setting/change of the SPC provisioning information and Network VCAC flag. Note that for SN08, at most one SPC can be provisioned.

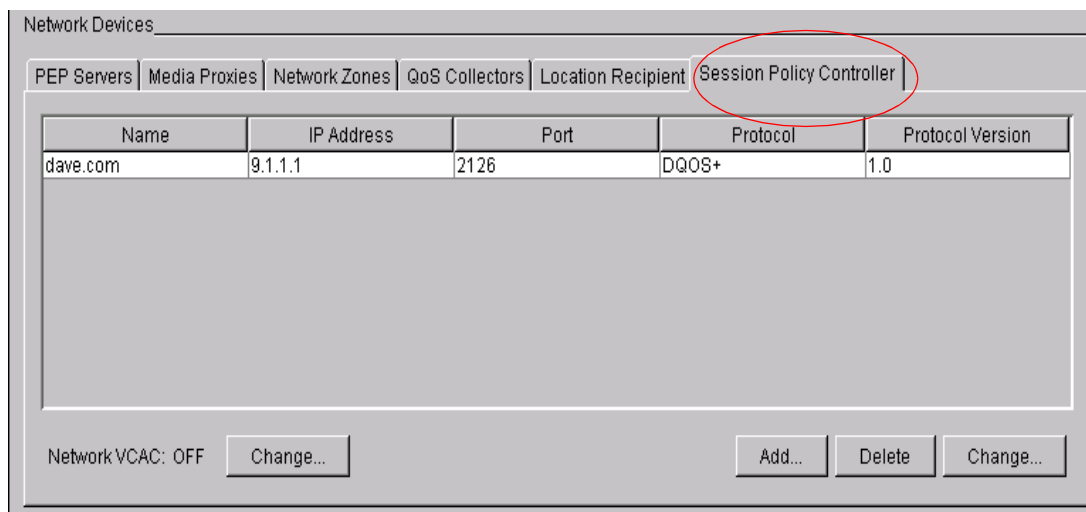
Provisioning constraints will be applied as per the GWCEM GUI guidelines, i.e. with disallowed input data resulting in a red outline to the input field and disabling of appropriate 'ok' buttons etc.

Note that in order to ensure optimum system operation is maintained during an upgrade, the upgrade of GWCs to SN08 should follow details specified in section xxxx.

### 1.8.1 Provision SPC information

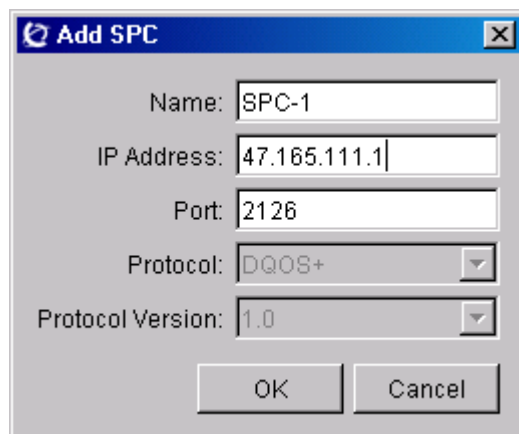
The SPC information is displayed in the Gateway Controller Main Panel, as a tab in the 'Network Devices' area. This is shown in Figure 3

**Figure 3 SPC Tab**



### Add SPC

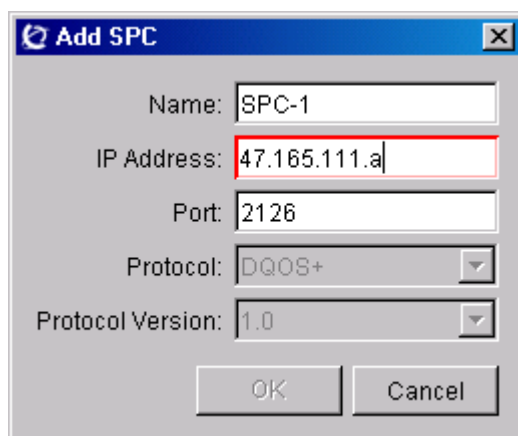
An SPC can be added via the 'Add' button and Add SPC dialog, Figure 4

**Figure 4 Add SPC Dialog**A screenshot of the 'Add SPC' dialog box. It has a title bar with a blue icon and the text 'Add SPC'. The dialog contains five input fields: 'Name' with the value 'SPC-1', 'IP Address' with the value '47.165.111.1', 'Port' with the value '2126', 'Protocol' with a dropdown menu showing 'DQOS+', and 'Protocol Version' with a dropdown menu showing '1.0'. At the bottom are 'OK' and 'Cancel' buttons.

Following information must be added:

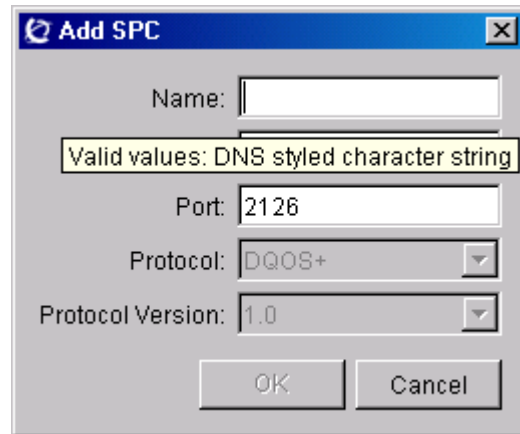
- Name (FQDN characters only)
- IP address (a.b.c.d) where a, b, c, d are integers between 0 and 255.
- Port (1 to 65535), defaults to DQOS port 2126.
- Protocol version (selected from list, or fixed at value if only one available)
- Protocol type (selected from list, or fixed at value if only one available)

If invalid data is entered, the corresponding input field is outlined in red and the ok button is disabled, Figure 5

**Figure 5 Add SPC Dialog - invalid data**A screenshot of the 'Add SPC' dialog box, similar to Figure 4, but with the 'IP Address' field containing the invalid value '47.165.111.a'. The 'IP Address' field is outlined in red, and the 'OK' button is disabled (grayed out).

Tool tips describe the valid input data for each text field, e.g. as shown in Figure 6

**Figure 6 Add SPC dialog - example tool tip**



The image shows a Windows-style dialog box titled "Add SPC". It contains four input fields: "Name:", "Port:", "Protocol:", and "Protocol Version:". The "Name:" field is currently empty, and a yellow tooltip box is displayed over it with the text "Valid values: DNS styled character string". The "Port:" field contains the value "2126". The "Protocol:" field is a dropdown menu showing "DQOS+". The "Protocol Version:" field is a dropdown menu showing "1.0". At the bottom of the dialog are "OK" and "Cancel" buttons.

### Delete SPC

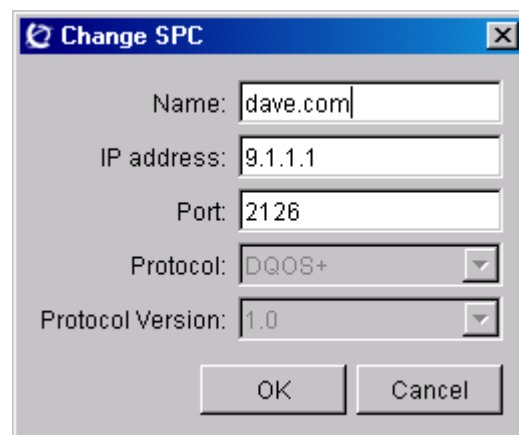
If an SPC is selected in the table then the 'delete' button is enabled. If delete is clicked then a confirmation message is displayed and if the user confirms the action, the SPC is deleted.

An error dialog is displayed and the delete is not performed if a policy is enabled for the SPC.

### Change SPC

If an SPC is selected in the table then the 'change' button is enabled. If change is clicked then a change dialog is displayed, Figure 7

**Figure 7 Change SPC Dialog**



The image shows a Windows-style dialog box titled "Change SPC". It contains five input fields: "Name:", "IP address:", "Port:", "Protocol:", and "Protocol Version:". The "Name:" field contains the value "dave.com". The "IP address:" field contains the value "9.1.1.1". The "Port:" field contains the value "2126". The "Protocol:" field is a dropdown menu showing "DQOS+". The "Protocol Version:" field is a dropdown menu showing "1.0". At the bottom of the dialog are "OK" and "Cancel" buttons.

The following fields can be changed:

- Name
- IP address
- Port
- Protocol type (only one protocol in SN08)
- Protocol version (only one protocol version in SN08)

If invalid data is entered, the corresponding input field is outlined in red and the ok button is disabled. Tool tips describe the valid input data

### **Set Network VCAC on/off**

The SN08 Gateway Controllers can operate in two VCAC modes: they can either attempt to count resource usage on the GWC itself (internal counting, Network VCAC 'off') or they can rely on the SPC to count resource usage and signal to the SPC for admission control during call set-up (Network VCAC 'on').

The current state of Network VCAC is shown on the SPC Panel. The user can set the Network VCAC on/off by using the Network VCAC change button on the SPC panel, see Figure 8, "Network VCAC field". A confirmation message is displayed stating

- VCAC counting will now be done on the SPC
- all GWCs and XA-core should be at version SN08
- If this is the first time Nw VCAC is set on, warning indicating that internal counting provisioning checks will no longer be supported.

**Figure 8 Network VCAC field**

The screenshot shows a configuration window titled "Network Devices". It has several tabs: "PEP Servers", "Media Proxies", "Network Zones", "QoS Collectors", "Location Recipient", and "Session Policy Controller". The "Network Zones" tab is selected. Below the tabs is a table with the following data:

| Name     | IP Address | Port | Protocol | Protocol Version |
|----------|------------|------|----------|------------------|
| dave.com | 9.1.1.1    | 2126 | DQOS+    | 1.0              |

Below the table, there is a large empty rectangular area. At the bottom of the window, there is a section labeled "Network VCAC: OFF". To the right of this label is a button labeled "Change...", which is circled in red. Further to the right are three buttons: "Add...", "Delete", and "Change...".

Note that after Network VCAC is set on for the first time, SESM will no longer carry out 'internal counting' related provisioning checks, regardless of whether Network VCAC is later switched off or not.

## 1.9 Network Zone provisioning

### 1.9.1 XML Interface

New XML interfaces are added are implemented by this feature for use in network installations where the SESM platform is required to operate in conjunction with an SPC. These interfaces align with the provisioning model used by the SPC for NAT and VCAC functionality and is described in terms of Network Zones and Zone characteristics.

The XML interfaces are identical to those supported by the SPC. In order to provision any entity, the information must first be provisioned into SESM and then, if successful, the same information must be provisioned into the SPC. The provisioning should be done first on SESM because SESM has more constraints to check (e.g. whether the Zone is currently associated with a Gateway) and hence is more likely to fail the provisioning request. The XML and XSD for these interfaces are specified in the SPC FN [Ref: <http://livelink-asiapac.us.nortel.com/asiapac/livelink.exe?func=ll&objId=1534787&objAction=browse&sort=name>] and will not be repeated here.

The SESM model only supports a subset of the information used by the SPC. The following general rules will be used:

- Add/change/delete commands: where a parameter is specific to the SPC and of no meaning to SESM, it will be ignored. Where a parameter is interpretable by SESM, its value will be validated



- queries: all relevant parameters for the specific query that are supported by SESM will be returned with valid data. No other parameters will be returned

The SN07 ITRANS VCAC interfaces for NAT and LBL provisioning are still available. However, when a SPC is deployed in the network configuration, the SPC consistent provisioning model is provided via use of the Zone provisioning interfaces and the SN07 ITRANS VCAC interfaces for NAT and LBL provisioning are not required. A mapping is available in table 3.

Note that, when adding a Network Zone, Resource Usage Factor and Max Count values are not required as long as Network VCAC is on (Details of Logical Network Link sent in XML messages 'addNetworkZone' and 'changeNetworkZone' are ignored by SESM. However if Network VCAC is 'off', resource usage factor and max count details ARE required and hence the XML command 'addLBL' should be used to add LBL Network Zones. However it is not recommend to switch Network VCAC off once it has been switched on. Also, if it is switched off, Basic VCAC will only work correctly if the topology still meets the Basic VCAC/'internal counting' topology constraints.

#### 1.9.1.1 Supported Interfaces For SPC Interworking

Add, Change and Delete Network Zone interfaces are implemented by SESM. In general, the Zone and the Zone parent can be referenced by either name or Zone ID, but not by both. For 'Add Network Zone', the Zone ID is optional and will be generated by SESM if not specified.

**Table 1 XML Interfaces Specific To SPC Topology Server Interworking For ITRANS**

| Interface         | SN07 VCAC ITRANS Equivalent | Description                                             |
|-------------------|-----------------------------|---------------------------------------------------------|
| addNetworkZone    | addNAT or addLBL            | Add either a NAT, LBL or Composite type network zone    |
| changeNetworkZone | changeNAT or changeLBL      | change either a NAT, LBL or Composite type network zone |
| deleteNetworkZone | deleteNAT or deleteLBL      | delete either a NAT, LBL or Composite type network zone |
| queryNetworkZone  | queryNAT plus queryLBL      | query on NAT, LBL and Composite data fill               |

##### 1.9.1.1.1 addNetworkZone Interface

This interface will add a new NAT, LBL or Composite type Network Zone. A composite Network Zone is one comprising the attributes of both a NAT and LBL type Network Zone.

The following parameters will be interpreted when adding a new Network Zone, with all other SPC specific parameters being ignored:

- <Name>NZ-Name</Name> - Unique name for the new Network Zone (NAT, LBL or Composite Name).
- <ID>1234</ID> - Unique ID for the Network Zone (NAT, LBL or Composite) to be created. If this is not specified, it is generated by SESM.
- <Parent> - Optional tag. Specified if Network Zone has a parent and contains tags ParentID or ParentName.
  - <ParentID>5678</ParentID> - ID of parent Network zone. Mutually exclusive with ParentName.
  - <ParentName>Parent-Name</ParentName> - Name of parent Network zone. Mutually exclusive with ParentID.
- </Parent>
- <Service>NAT</Service> - Optional. Identifies Network Zone as being a NAT or Composite type Network Zone. For a Composite Network Zone the LogicalNetworkLink tag should also be present.
- <LogicalNetworkLink> - Optional. Identifies the Network Zone as being an LBL or Composite Network zone. For a Composite Network Zone the Service tag should also be present.
  - ... Contents of LogicalNetworkLink are ignored but should be correctly populated.
- </LogicalNetworkLink>

At least one of the tags Service and LogicalNetworkLink must be present.

If both Service and LogicalNetworkLink tags are present, the Zone is a composite NAT & LBL zone.

All other input data is ignored by SESM.

#### **1.9.1.1.2 changeNetworkZone Interface**

This interface will modify either a NAT, LBL or Composite type Network Zone.

For the change command, the user will specify tags for the parameters that are to be changed. Unchanged parameters do not have to be specified. The Network Zone name and ID cannot be changed. All other parameters can be changed. SESM will ignore changes to parameters that it does not hold (e.g. bandwidth, link types etc.).

Interpreted parameter tags are as follows:

- <Name>NZ-Name</Name> - Network Zone Name

\*\* or \*\*

- <ID>1234</ID> - Network Zone ID
- <Parent> - Optional tag identifying a new Parent Network Zone. Contains either ParentName or ParentID tags but not both.
  - <ParentID>5678</ParentID> - new parent ID. Set to 0 if no parent required. Mutually exclusive with ParentName.
  - <ParentName>New-Parent-Name</ParentName> - new parent Network Zone name. Mutually exclusive with ParentID.
- </Parent>
- <LogicalNetworkLink> - optional. If present the Network Zone type is checked to ensure it is not a NAT as the presence of this tag implies a change of Network Zone type which is not supported.
  - ... contents of LogicalNetworkLink are ignored
- </LogicalNetworkLink>

#### 1.9.1.1.3 deleteNetworkZone Interface

This interface will delete either a NAT, LBL or Composite type Network Zone.

Interpreted parameter tags are as follows:

- <Name>NZ-Name</Name> - Name of Network Zone to be deleted.

\*\* OR \*\*

- <ID>1234</ID> - ID of the Network Zone to be deleted.

#### 1.9.1.1.4 queryNetworkZone Interface

This interface will perform a selective query on the provisioned NAT, LBL and Composite type network zones. Based on the population of the request it is possible to retrieve a single network zone name or all network zones names. The network zone IDs may also be optionally retrieved. This command differs from the SN07 queryNAT and queryLBL interfaces in that the returned data is a combination of the provisioned NATs and LBLs. It is not possible to selectively retrieve those network zones of a particular service type.

In general, since SESM holds a subset of the topology information held by SPC (i.e. it has no link information), the user should carry out queries on SPC. SESM will support both individual and bulk queries, however it is expected that only the bulk queries will be used. Bulk queries will be needed e.g. to audit the SESM-SPC data consistency. The result of the bulk query will be sorted by ID.

Interpreted input parameter tags are as follows:

Name or ID - Optional parameter indicating we wish to query a specific Network Zone. If not specified it is assumed that all Network Zones should be queried.

- `<Name>Bob</Name>` - requests retrieval of “Bob” Network Zone OR
- `<ID>1234</ID>` - requests retrieval of Network Zone with ID 1234.

Filtering parameters to limit the number of zones returned. These are optionally present but only for bulk zone queries (i.e. when no name or id is specified)

- `<IDMax>12000</IDMax>` - maximum Network Zone ID
- `<IDMin>11001</IDMin>` - minimum Network Zone ID
- `<MaxZones>1234</MaxZones>` - maximum number of Zones to be returned. If more Zones exist than the maximum specified, this will be indicated via an error code.

Returned parameter tags are as follows:

- `<ID>1234</ID>` - Unique ID for a Network Zone.
- `<Name>NZ-Name</Name>` - Unique Network Zone name.
- `<ParentID>5678</ParentID>` - ID of parent Network Zone. Where there is no parent this will be set to 0.

Additionally for query of individual Network Zone, the following information is also returned:

- `<Service>NAT</Service>` - Service type indicating if this Network Zone is a NAT. If the zone is has no services, no service tag is returned.
- `<LogicalNetworkLink>` - returned only if the Network Zone type is LBL or Composite. This will contain LayerInfo, Layer and LinkLayerInfo tags, with the LinkLayerInfo tag assigned a dummy value of “UNKNOWN” as SESM has no knowledge of Network Zone parameter values.

### 1.9.1.2 Unsupported Interfaces

The SESM platform only supports a subset of the SPC Topology server VCAC ITRANS interfaces. In SN08, add/change/delete/query LinkLayer type are not supported by SESM. However, to aid simple XML command replication by the OSS, these will be a dummy commands in SESM & will always return an error code 306 and text 'SPC Interface Unsupported By Platform'. (The alternative is for SESM not to support this, however this means a single XSD cannot be published and requires OSS to understand which commands go only to the SPC.)

Unsupported interfaces are described in the following table:

**Table 2 SPC Topology Server ITRANS Interfaces Unsupported By SESM**

| Interface           | Description                   |
|---------------------|-------------------------------|
| addLinkLayerType    | add a new link layer          |
| changeLinkLayerType | change an existing link layer |
| deleteLinkLayerType | delete a link layer           |
| queryLinkLayerType  | query provisioned link layers |

### 1.9.1.3 NAT/LBL provisioning interfaces

The SN07 ITRANS VCAC interfaces for NAT and LBL provisioning are still available. When a SPC is deployed in the network configuration, a consistent provisioning model is provided via use of the Zone provisioning interfaces.

However the SN07 interfaces remain valid ITRANS VCAC interfaces for NAT and LBL provisioning (table 3) and should be used when the SPC is not present in the network configuration.

**Table 3 SN07 SESM ITRANS VCAC Interfaces.**

| Interface             | Description                                                                                                                                                                                                       |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| addNAT                | Add NAT - use addNetworkZone.                                                                                                                                                                                     |
| changeNAT             | Change NAT - use changeNetworkZone                                                                                                                                                                                |
| deleteNAT             | Delete NAT - use deleteNetworkZone                                                                                                                                                                                |
| queryNAT              | Query NAT - use queryNetworkZone. See Note following table.                                                                                                                                                       |
| addLBL                | Add LBL - replaced by addNetworkZone. Resource usage and counter functionality is set to default values.                                                                                                          |
| changeLBL             | ChangeLBL - replaced by changeNetworkZone. Resource usage and counter functionality is set to default values.                                                                                                     |
| deleteLBL             | Delete LBL - replaced by queryNetworkZone.                                                                                                                                                                        |
| queryLBL              | Query LBL - use QueryNetworkZone Interface (safe but deprecated)                                                                                                                                                  |
| changeRootMiddleBoxes | Change Root Middle Boxes - use changeNetworkZone interface                                                                                                                                                        |
| changeAssocMB         | Change associated middlebox - use changeNetworkZone interface                                                                                                                                                     |
| addRU                 | Add Resource Usage. SESM has no concept of resource usage where SPC Topology server is present. Internally default settings will be used for modelling purposes, and attempting manipulation would make no sense. |
| changeRU              | Change Resource Usage.                                                                                                                                                                                            |
| deleteRU              | Delete Resource Usage                                                                                                                                                                                             |

**Table 3 SN07 SESM ITRANS VCAC Interfaces.**

| Interface | Description          |
|-----------|----------------------|
| queryRU   | Query Resource Usage |

*Note:* Interface remains used by CICM Element Manager.

## 1.9.2 Error codes

Each error code will have a descriptive text string associated with it. It is not possible to guarantee that the same error will result in the same error code being returned by SPC and SESM. However the sequential provisioning required (first into SESM and then into SPC) means that typically the OSS will get an error code back from one machine only - since if the SESM command fails, it will not continue to do the provisioning into SPC.

### 1.9.2.1 Examples Of XML Interface Usage

#### 1.9.2.1.1 Add NAT using addNetworkZone (Request)

```

<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <addNetworkZone usn="1" version="1.0"/>
      <Parameters>
        <ID>1001</ID>
        <Name>My_NAT</Name>
        <Service>NAT</Service>
        <Parent>
          <ParentID>1000</ParentID>
        </Parent>
        ...
      </Parameters>
    </addNetworkZone>
  </Methods>
</Command>

```

Parent if we have a parent  
Named parent by ID

SPC Parameters, not shown, no logical network link is present

### 1.9.2.1.2 Add LBL using addNetworkZone (Request)

```

<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <addNetworkZone usn="1" version="1.0">
        </Parameters>
        <Name>My_LBL</Name>
        <Parent>
          <ParentName>MyParent</Parent>
        </Parent>
        <LogicalNetworkLink>
          <BandwidthInfo>
            <Symmetry>true</Symmetry>
            <UpBWInfo>
              <BWCIR>1000</BWCIR>
              ... SPC specific parameters
            </UpBWInfo>
            <DownBWInfo>
              <BWCIR>1000</BWCIR>
              ... SPC specific parameters
            </DownBWInfo>
          </BandwidthInfo>
          ...SPC specific parameters
        </LogicalNetworkLink>
        ... SPC specific parameters
      </Parameters>
    </addNetworkZone>
  </Methods>
</Command>
</CommandList>

```

Parent if we have a parent  
 Named using NZ Name  
 Contents of BandwidthInfo  
 loosely interpreted.  
 Contents are ignored.

### 1.9.2.1.3 Add Composite NAT/LBL using addNetworkZone (Request)

```

<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <addNetworkZone usn="1" version="1.0">
        </Parameters>
        <Name>My_LBL</Name>
        <Service>NAT</Service>
        <Parent>
          <ParentID>1010</ParentID>
        </Parent>
        <LogicalNetworkLink>
          <BandwidthInfo>
            <Symmetry>>false</Symmetry>
            <UpBWInfo>
              <BWCIR>1000</BWCIR>
              ... SPC specific parameters
            </UpBWInfo>
          </BandwidthInfo>
          ...SPC specific parameters
        </LogicalNetworkLink>
      </Parameters>
    </addNetworkZone>
  </Methods>
</Command>
</CommandList>

```

Optional ID not specified

Name parent using ID

Contents of BandwidthInfo loosely interpreted. Contents are ignored.

... SPC specific parameters

...SPC specific parameters



#### 1.9.2.1.4 Change Network Zone (LBL or NAT) (Request)

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <changeNetworkZone usn="1" version="1.0">
        <Parameters>
          <Name>My_Zone</Name>
          <Parent>
            <ParentName>New-Parent</ParentName>
          </Parent>
          ...
        </Parameters>
      </changeNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

Change parent using name

SPC specific parameters not shown

#### 1.9.2.1.5 Delete Network Zone (LBL or NAT) (Request)

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITranslf</Interface>
    <Methods>
      <deleteNetworkZone usn="1" version="1.0">
        <Parameters>
          <Name>My_Zone</Name>
        </Parameters>
      </deleteNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

Target Network Zone using Name

### 1.9.2.1.6 Query Network Zone (All) (Request)

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <Parameters>
        </Parameters>
      </queryNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

### 1.9.2.1.7 Query Network Zone (Range Min ID Max ID) (Request)

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <Parameters>
          <IDMin>500</IDMin>
          <IDMax>900</IDMax>
        </Parameters>
      </queryNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

### 1.9.2.1.8 Query Network Zone (Range Min ID MaxZones) (Request)

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <Parameters>
          <IDMin>500</IDMin>
          <MaxZones>200</MaxZones>
        </Parameters>
      </queryNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

### 1.9.2.1.9 Query Network Zone (Individual ID Based) (Request)

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <Parameters>
          <ID>101</ID>
        </Parameters>
      </queryNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

### 1.9.2.1.10 Query Network Zone (Individual Name Based) (Request)

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <Parameters>
          <Name>Peter67</Name>
        </Parameters>
      </queryNetworkZone>
    </Methods>
  </Command>
</CommandList>
```

### 1.9.2.1.11 Query Network Zone (All / Range) (Response)

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <ReturnData>
          <NetworkZone>
            <ID>235</ID>
            <Name>NZ1</Name>
            <ParentID>0</ParentID>
          </NetworkZone>
          <NetworkZone>
            <ID>891</ID>
            <Name>NZ2</Name>
            <ParentID>235</ParentID>
          </NetworkZone>
          <NetworkZone>
            <ID>65539</ID>
            <Name>Nat.1</Name>
            <ParentID>0</ParentID>
          </NetworkZone>
          <NetworkZone>
            <ID>65540</ID>
            <Name>lbl1</Name>
            <ParentID>0</ParentID>
          </NetworkZone>
          <NetworkZone>
            <ID>65541</ID>
            <Name>comp1</Name>
            <ParentID>0</ParentID>
          </NetworkZone>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryNetworkZone>
    </Methods>
  </Response>
</CommandList>
```

### 1.9.2.1.12 Query Network Zone (Individual) (Response)

```
<?xml version='1.0'?>
<CommandList>
  <Response>
    <Interface>ITransIf</Interface>
    <Methods>
      <queryNetworkZone usn="1" version="1.0">
        <ReturnData>
          <ID>65541</ID>
          <Name>comp1</Name>
          <Service>NAT</Service>
          <Parent>
            <ParentID>0</ParentID>
          </Parent>
          <LogicalNetworkLink>
            <LayerInfo>
              <Layer>
                <LinkLayerType>UNKNOWN</LinkLayerType>
              </Layer>
            </LayerInfo>
          </LogicalNetworkLink>
          <ReturnCode value="0" text="Successful result" />
        </ReturnData>
      </queryNetworkZone>
    </Methods>
  </Response>
</CommandList>
```

## 1.9.3 GUI Client

The GUI client for internet transparency NAT and VCAC entity provisioning will be available for network deployments where the SPC is present and for deployments where the SPC is not present. Hence the GUI must effectively support both the SN07 and SN08 models. Hence the GUI will not be changed significantly from the SN08. The changes are as follows:

### 1.9.3.1 Network Zone Display

There will be a new panel on the Network Devices tabbed panel, this will be a tabbed panel with tab 'Network Zones'.

The NAT and LBL provisioning panels will be moved from the Network devices tabbed panel the Network Zones tabbed panel. In addition, there will be a new provisioning panel for provisioning composite NAT/LBL Network Zones (this functionality to be confirmed), see Figure 9

**Figure 9 Network Zones tabbed panel**

Network Devices \_\_\_\_\_

PEP Servers | Media Proxies | **Network Zones** | QoS Collectors | Location Recipient | Session Policy

NAT Zone | LBL Zone | NAT&LBL Zone

| Name    | NAT Type       |            |
|---------|----------------|------------|
| Fred.1  | Non-Controlled | <none> (To |
| MFNAT.1 | Non-Controlled | <none> (To |
| MFNAT.2 | Non-Controlled | <none> (To |
| MFNAT.3 | Non-Controlled | <none> (To |
| MFNAT.4 | Non-Controlled | <none> (To |
| MFNAT.5 | Non-Controlled | <none> (To |
| MFNAT.6 | Non-Controlled | MFLBL.4    |

Add... Delete

### 1.9.3.2 Add/Change/Delete Zone

In the add/change/delete NAT & LBL dialogs and for add/change NAT/LBL associated to gateway, the word 'Middlebox' will generally be replaced with either 'Zone' or 'Network Zone', for example as in Figure 10.

**Figure 10 Add NAT Zone**

**Add IP-VPN (NAT Zone)**

Name: \_\_\_\_\_

☐ Shared Zone

NAT Type: Non-Controlled

Parent Zone Selection (create hierarchy)

☒ ALL ☐ IP-VPNs ☐ LBLs

Parent Zone: <none>

OK Cancel

### 1.9.3.3 LBL provisioning

When the SPC is present, the user does not need to provision the RU Profile Name and Max Count Value when provisioning an LBL. Hence, when the Network VCAC flag is switched 'on', fields to provision and change RU

Profile and Max count information will be hidden. Internally, the RU Profile will be set to a system provisioned RU Profile created on system initialisation, SPC\_DEFAULT and the Max count set to 0 (tbc). Fields which display this information in the LBL zone table will also be hidden. If the Network VCAC flag is switched off, the RU Profile and max count information is displayed again.

Similarly, the RU provisioning panel will be hidden/displayed when the Network VCAC flag is switched on/off.

#### 1.9.3.4 Composite NAT & LBL provisioning (this work item tbc)

Similar dialogs will be supported for add/change/delete composite NAT/LBL zone as for NAT zones. This option is only available when the SPC is used and RU Profile and max count information is not required. Hence similar dialogs/display will be supported for add/change/delete/display composite NAT/LBL zone as for NAT zones. Note that in this case, NO profile or max count information is sent to the GWC and, for internal counting, the zone is treated as a NAT zone.

### 1.10 XML Interfaces Supported By SPC

The SPC platform only supports a subset of the ITRANS XML interfaces. No attempt should be made to direct unsupported XML interface operations against the SPC.

The set of supported XML interfaces at the SPC are as follows. All other interfaces should be considered as supported only by SESM.

**Table 4 ITRANS XML Interfaces Supported By The SPC Platform**

| Interface Name      |
|---------------------|
| addNetworkZone      |
| changeNetworkZone   |
| deleteNetworkZone   |
| queryNetworkZone    |
| addLinkLayerType    |
| changeLinkLayerType |
| deleteLinkLayerType |
| queryLinkLayerType  |

## 1.11 Authorization for Commands

The security for the GUI Client and OSSgate interface includes support for permission or 'Authorization' levels for commands. Each command is associated with one or more user groups. In order to execute a command, a user must belong to at least one of the associated user groups. The user groups associated with the new /modified commands associated with this feature are specified in the table below.

**Table 5 Internet Transparency Commands Authorization**

| Command                 | User Group |       |        |          |       |
|-------------------------|------------|-------|--------|----------|-------|
|                         | mgcadm     | mgcrw | mgcmic | mgcsprov | mgcro |
| add SPC                 | X          |       |        |          |       |
| delete SPC              | X          |       |        |          |       |
| change SPC              | X          |       |        |          |       |
| display SPCs            | X          | X     | X      | X        | X     |
| set Network VCAC        | X          |       |        |          |       |
| add Network Zone        | X          | X     |        |          |       |
| delete Network Zone     | X          | X     |        |          |       |
| change Network Zone     | X          | X     |        |          |       |
| query Network Zone      | X          | X     | X      | X        | X     |
| query all Network Zones | X          | X     | X      | X        | X     |

## 1.12 Upgrade

In order to ensure optimum system operation is maintained during an upgrade, the upgrade of GWCs to SN08 should follow details specified in the FN for feature A00007394

## 1.13 Glossary

| Term  | Description                        |
|-------|------------------------------------|
| CS2K  | Communication Server 2000          |
| GUI   | Graphical User Interface           |
| GWC   | Gateway Controller                 |
| GWCEM | Gateway Controller Element Manager |



| Term | Description                                |
|------|--------------------------------------------|
| ID   | Identifier                                 |
| IEMS | Integrated Element Manager System          |
| LBL  | Limited Bandwidth Link                     |
| ME   | Media Endpoint                             |
| NAT  | Network Address Translation                |
| NGSS | Next Generation Sessions Server            |
| OSS  | Operations Support System                  |
| SESM | Succession Element and Sub-element Manager |
| SPC  | Session Policy Controller                  |
| VCAC | Virtual Connection Admission Control       |
| VPN  | Virtual Private Network                    |
| XML  | Extensible Markup Language                 |

## 1.14 Appendix A: Error codes and messages

**Table 6 Return codes when command is unsuccessful**

| Error meaning                                                                                                  | Return code | Example return messages                                |
|----------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------|
| Platform applications internal error: OSS Interface applications cannot connect to required server application | 302         | Interfacing error                                      |
| Unable to provision requested data because a database error occurred                                           | 303         | Database error occurred during setting of Network Zone |
| Unable to provision requested data because of problem with the GWCEM component of the CS2k Mgr.                | 304         | Element Manager Initialisation in progress             |
| No data for this query meets selection criteria or the filtering criteria specified do not exist               | 305         | No Network Zones found                                 |

| Error meaning                                                                           | Return code | Example return messages                            |
|-----------------------------------------------------------------------------------------|-------------|----------------------------------------------------|
| Interface is valid based on ITrans XSD schema but is unsupported by SESM (SPC specific) | 306         | SPC Interface<br>Unsupported By Platform           |
| User is not a member of any of the user groups allowed to perform this action           | 501         | Insufficient permissions to perform this operation |

### 1.14.1 Example Error Message

```

<?xml version='1.0'?>
  <CommandList>
    <Response>
      <Interface>ITransIf</Interface>
      <Methods>
        <queryNAT usn="1.0" version="1.0">
          <ReturnData>
            <NATname>nat1111</NATname>
            <ReturnCode value= "305" text="NAT not found"/>
          </ReturnData>
        </queryNAT usn="1.0">
      </Methods>
    </Response>
  </CommandList>

```

## 1.15 Appendix B: XML Commands: description of method parameters

### 1.15.1 Parameter definitions

Only those parameters that are read / returned by the VCAC ITrans interface are described.

- **encoding** - UTF-8.
- **version** - The version refers to the version of the method or operation - e.g., the addNAT operation may have version 1.0 and 2.0, where version 1.0 takes parameters X and Y and version 2.0 takes parms X, Y, and Z. TYPE *decimal*.
- **usn** - Unique Sequence Number. This parameter is introduced to facilitate sending multiple XML commands in one file. This parameter value will be used to match the responses with the requests. TYPE *integer*.
- **Name** - Unique Network Zone name.
- **ID** - Unique Network Zone ID.

- **ParentName** - Name of parent Network Zone.
- **ParentID** - ID of parent Network Zone.
- **Service** - Network Zone service type. Only supported value is “NAT”.
- **Symmetry** - LogicalNetworkLink - BandwidthInfo symmetry field. Boolean value but setting ignored by SESM but has meaning to SPC.
- **BWCIR** - LogicalNetworkLink - BandwidthInfo - UpBWInfo / DownBWInfo BWCIR setting. Value is ignored by SESM but has meaning to SPC.
- **LinkLayerInfo** - LogicalNetworkLink - LayerInfo - Layer - LinkLayerType field. Value is ignored by SESM being SPC specific.
- **IDMin** - Minimum Network Zone ID for a query.
- **IDMax** - Maximum Network Zone ID for a query.
- **MaxZones** - Maximum number of Network Zones for a query.
- **ReturnCode value**- A numeric value indicating the result of the attempted operation (see Table 3, for range and definitions of each possible value). TYPE *string*.
- **Return code text**- Appropriate text that describes the result of the operation. TYPE *string*.

### 1.15.2 Method Parameters

Method parameters are defined below. Input data is mandatory except where indicated otherwise.

1. **addNetworkZone** - Method that adds a new Network Zone. This method has the following parameters:
  - Input data:
    - usn
    - version
    - Name
    - ID (optional internally generated if not specified)
    - ParentName (optional and mutually exclusive with ParentID)
    - ParentID (optional and mutually exclusive with ParentName)
    - Service (optional only if NAT / Composite Network Zone required)
    - Symmetry (optional only if LBL / Composite Network Zone required)
    - BWCIR (optional only if LBL / Composite Network Zone required).
  - Output data:
    - usn (value should be the same as the input)

- version (value should be the same as the input)
  - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
2. **changeNetworkZone** - Method that modifies a parent Network Zone. This method has the following parameters:
- Input data:
    - usn
    - version
    - Name (Mutually exclusive with ID parameter)
    - ID (Mutually exclusive with Name parameter)
    - ParentName (optional and mutually exclusive with ParentID)
    - ParentID (optional and mutually exclusive with ParentName)
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
3. **deleteNetworkZone** - Method that deletes a Network Zone. This method has the following parameters:
- Input data:
    - usn
    - version
    - Name (Mutually exclusive with ID parameter)
    - ID (Mutually exclusive with Name parameter)
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
4. **queryNetworkZone** - Method that queries the Network Zones provisioned on the SESM platform. This method has the following parameters:
- Input data:

- usn
- version
- Name (optional and mutually exclusive with ID. Presence restricts query to a single Network Zone)
- ID (optional and mutually exclusive with Name. Presence restricts query to a single Network Zone)
- IDMin (Optional. Not valid if query targets a specific Network Zone).
- IDMax (Optional. Not valid if query targets a specific Network Zone).
- MaxZones (Optional. Not valid if query targets a specific Network Zone).
- Output data:
  - usn (value should be the same as the input)
  - version (value should be the same as the input)
  - ID
  - Name
  - ParentID
  - Service - where individual Network Zone is targeted and type is NAT or Composite. Value is set to “NAT”
  - LinkLayerType - where individual Network Zone is targeted and type is LBL or Composite. Value is set to “UNKNOWN”
  - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.

## ***Product = CS 2000 Management Tools***

### **A00007300--Enable by default IPSec on All GWC Profiles**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP, PT-IP, CHS, PT-AAL2

#### **1.2 Description**

This SN08 activity enables IPSec on all GWC profiles that do not currently have the IPSec capability. As a result of enabling IPSec on all remaining GWC

profiles, the IPSec provisioning tab will now be available in the CS2000 Management Tools GUI for all GWC profiles.

### 1.3 Hardware Requirements or Dependencies

Not applicable

### 1.4 Software Requirements or Dependencies

Not applicable

### 1.5 Limitations and restrictions

Not applicable

### 1.6 Interactions

Not applicable

### 1.7 Glossary

| Term  | Description        |
|-------|--------------------|
| GWC   | Gateway Controller |
| IPSec | IP Security        |

## *Product = CS 2000 Management Tools*

## **A00007564--SAM21 EM support for new hardware MCPN905** *Functional Description*

### 1.1 Applicable Solution(s)

UA-IP, PT-AAL2

### 1.2 Description

#### 1.2.1 Feature Overview

This feature introduces two new components:

- Enable Supporting MCPN 905 card in SAM21 EM
- Enable provisioning of GWC and USPc service types on MCPN 905 card

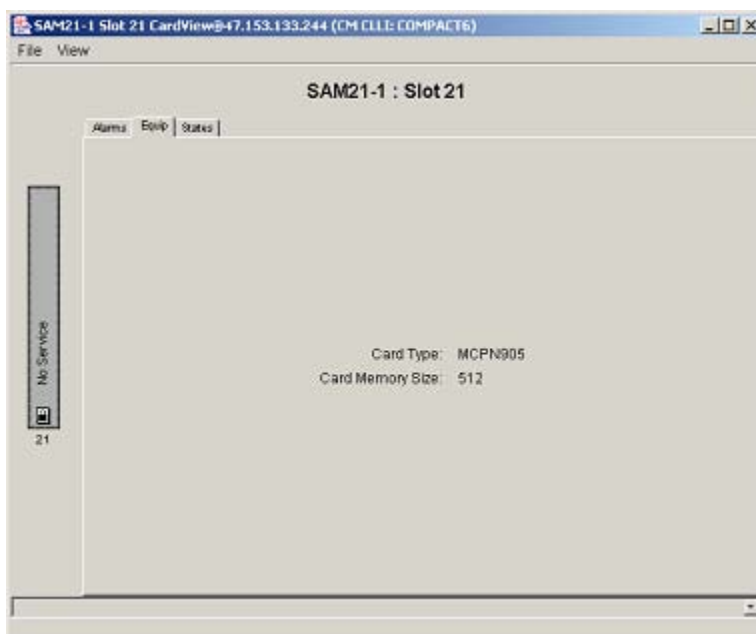
#### 1.2.2 Feature Functionality

MCPN 905 card currently support three functions, GWC and USPc, which are already supported by SAM21 EM. Their provisioning requirements for MCPN905 card are same as those for other cards. So the existing codes for all

services are reused here, including provisioning panel, bootp entries, database storage, etc. However, to support a new card type, you must modify the hardware and memory requirements definition for the applications.

### 1.2.2.1 MCPN 905 card insertion support

When a MCPN 905 card insert into SAM21 shelf, the SAM21 EM will get the insertion trap, and show the card on the EM GUI. When opening the card view panel about this card, the card name will be displayed on the “Equip” panel.



### 1.2.2.2 MCPN 905 card service support

MCPN 905 card supports two type services, GWC and USPc. SAM21 EM should determine the services that can be assigned to the card according to the memory size. Below table shows the relation between the memory size and the service type.

**Table 7 Memory requirements to enable GWC or USP service on MCPN 905 card**

| Memory on MCPN 905 Card | Is GWC Service Allowed (Yes/No) | Is USPc Service Allowed (Yes/No) |
|-------------------------|---------------------------------|----------------------------------|
| 512M                    | Yes                             | Yes                              |
| 1.5G                    | Yes                             | No                               |

### 1.3 Hardware Requirements or Dependencies

This feature will support a new card model, MCPN 905, which supports USPC and GWC services.

### 1.4 Software Requirements or Dependencies

No new customer software or firmware dependencies are introduced in this feature.

### 1.5 Limitations and restrictions

No limitations or restrictions that is visible to any user are planned as part of this feature.

### 1.6 Interactions

- MCPN905 support in Shelf Controller DID A00007423
- MCPN905 support in Shelf Controller DSUM A00007423
- support MCPN905 card in SAM21EM DID A00007564

## *Product = CS 2000 Management Tools*

## **A00007927--SAM21 Enhancements from Bell Canada**

### *Functional Description*

#### 1.1 Applicable Solution(s)

UA-IP

#### 1.2 Description

In SN07 and earlier, there is “Administrative State” in both SAM21 EM and GWC EM GUI. In SAM21 EM the “Administrative State” indicates the H/W state of a card, while in GWC EM it indicates the state of the application running on the card. However, if a user doesn’t understand what it means, he/she may feel confused.

In SN07 and earlier, when a NSS card (no matter it’s Unlocked/Enabled or Locked/Disabled) is pulled out and then inserted, it will come back in a Locked/Disabled state. The user needs to manually unlock it to bring it into service.

This document outlines the design scope and requirements of this feature that:



- Changes the label of “Administrative” to “Card Status” in every card view on SAM21 EM GUI (refer to figure 1 and figure 2).
- Changes the behavior of EM on pulling/inserting NSS card. If a Locked/Disabled NSS card is pulled, when it is re-inserted, the card will come back in Locked/Disabled status. However, if an Unlocked/Enabled NSS card is pulled, when it is re-inserted, SAM21 EM will automatically unlock this card.

**Figure 11 Non-System Card View**

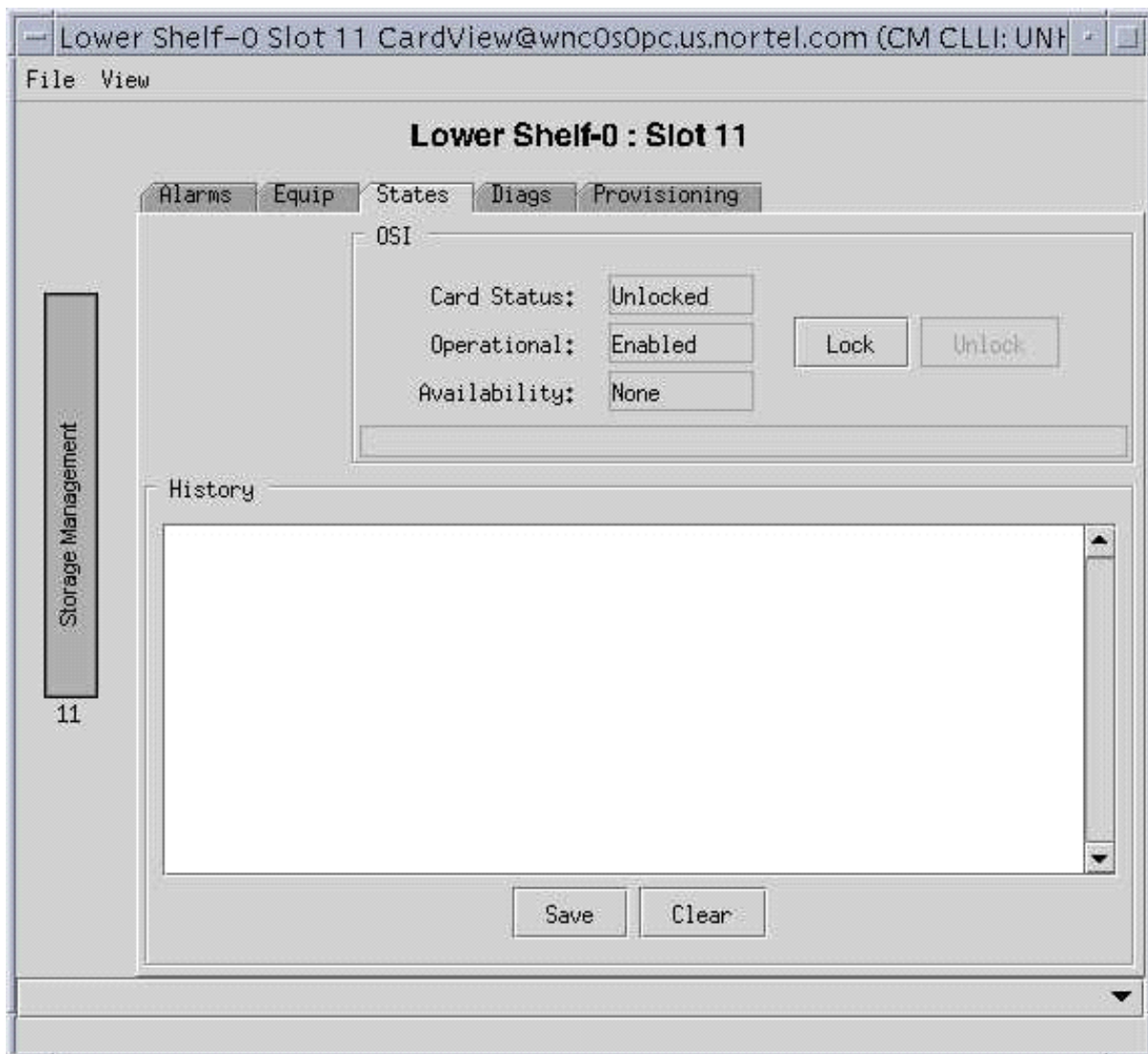
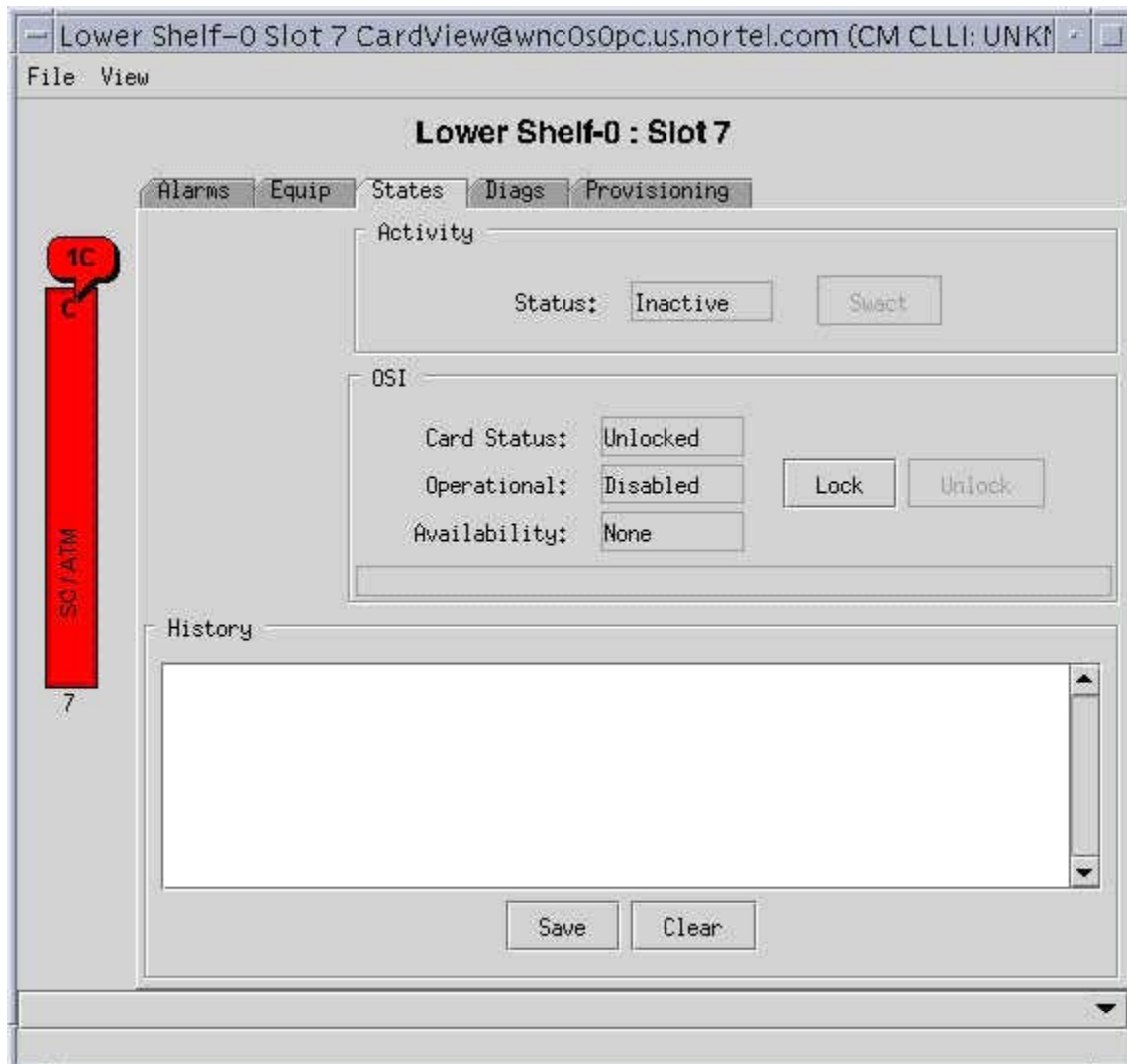


**Figure 12 Shelf Controller Card View**

### 1.3 Checking the State Tab of card views on the SAM21 EM GUI

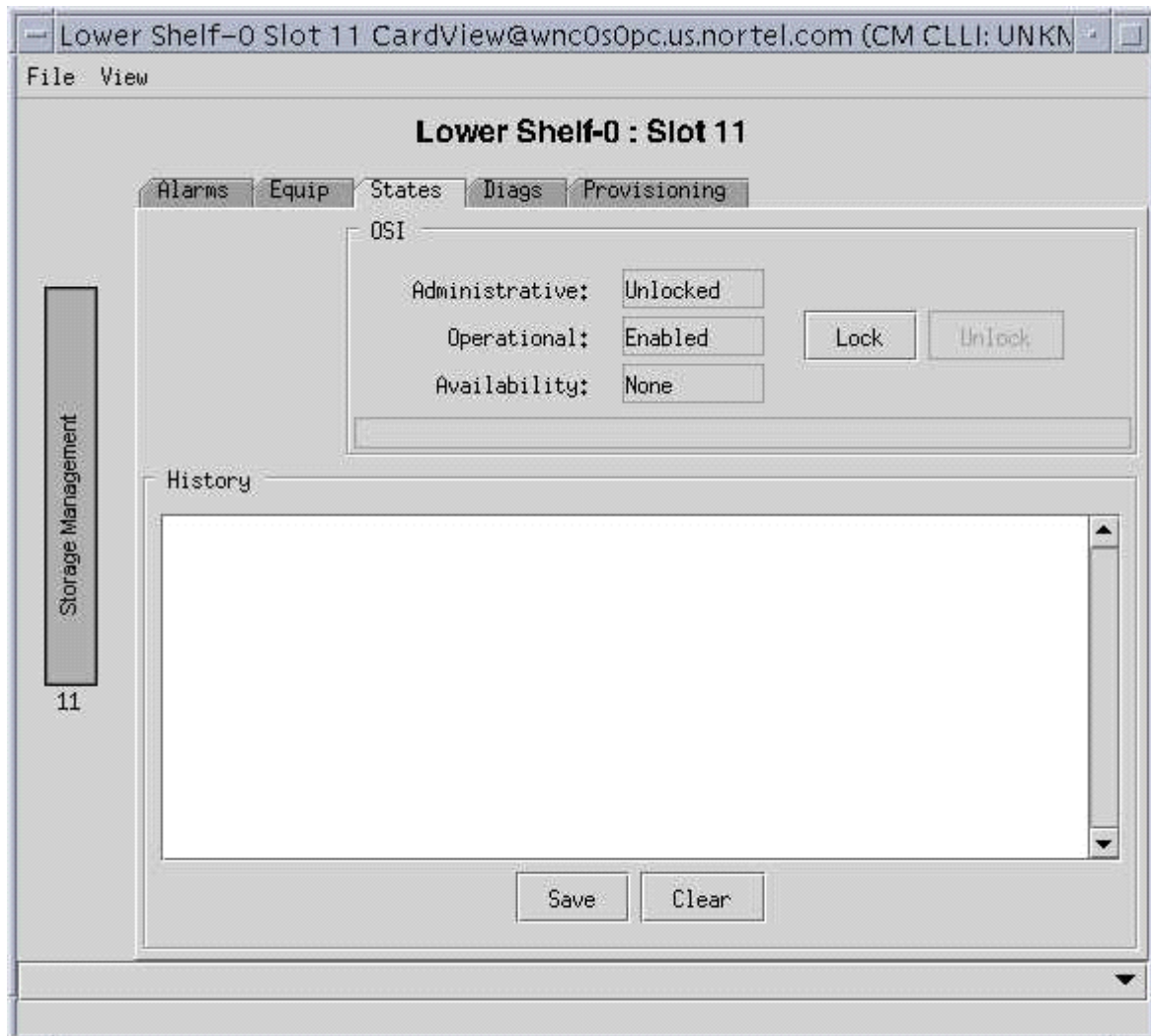
Use the following procedure to see changes in the state tab of every card view on the SAM21 EM GUI.

At your workstation

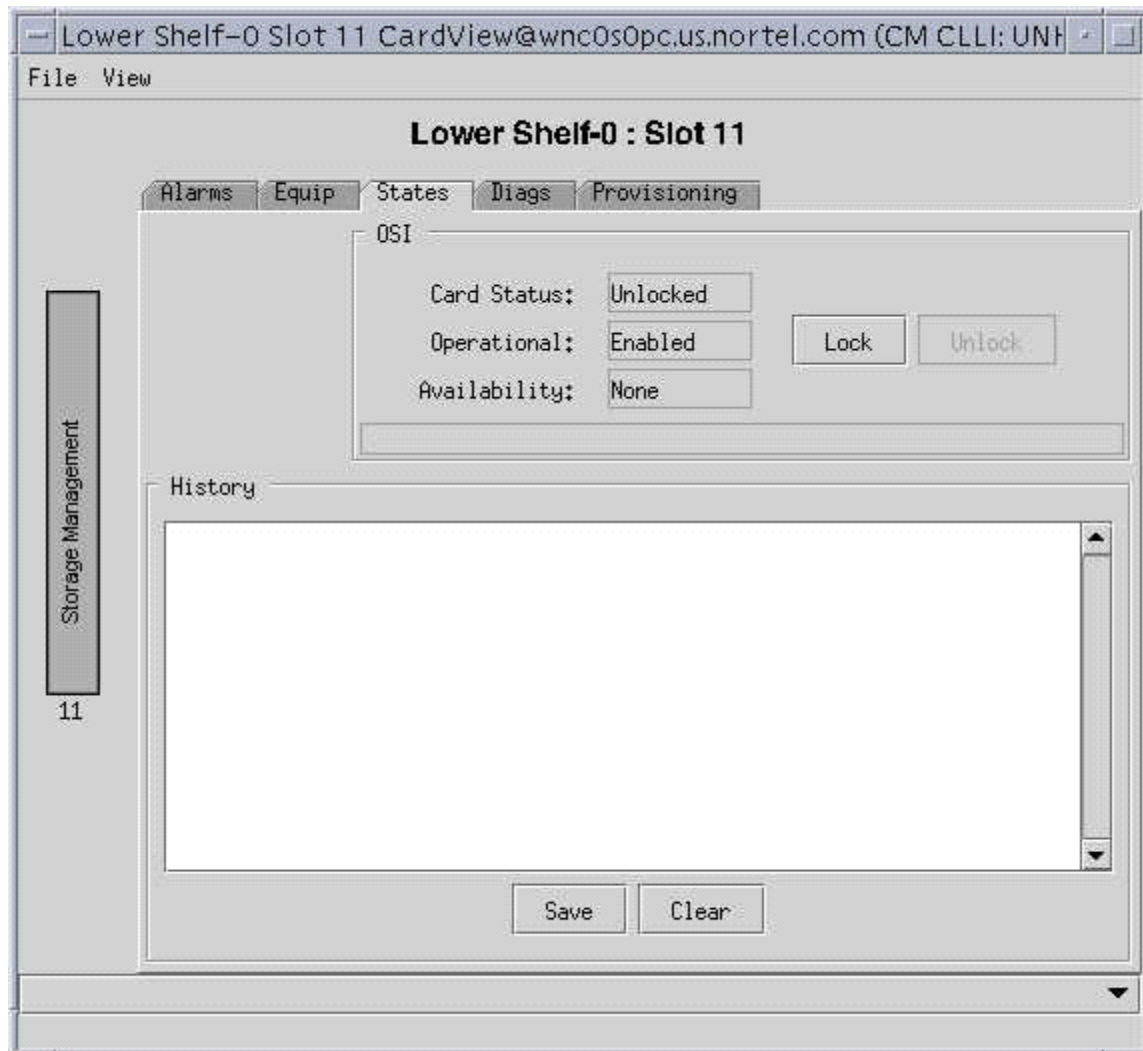
1. Launch your web browser.
2. Launch the SAM21 EM GUI via the common launch page: <http://{SSPFS serve IP or hostname}>.
3. Click on the Shelf icon to open the Shelf View.

4. Right click on a card (e.g. a STORM) to bring up the Card View.
5. Click the States tab on the Card View.

In SN07 or earlier, you will see a display as below:



In SN08, you will see a display as below:



You have completed this procedure.

***Product = CS 2000 Management Tools***

**A00008338--QCA Log/Alarm Consolidation**

## ***Functional Description***

### **1.1 Applicable Solution(s)**

IAC

### **1.2 Description**

This document covers the LOG/ALARM Consolidation for QoS Collector Application functionality supported in SN08 time frame.

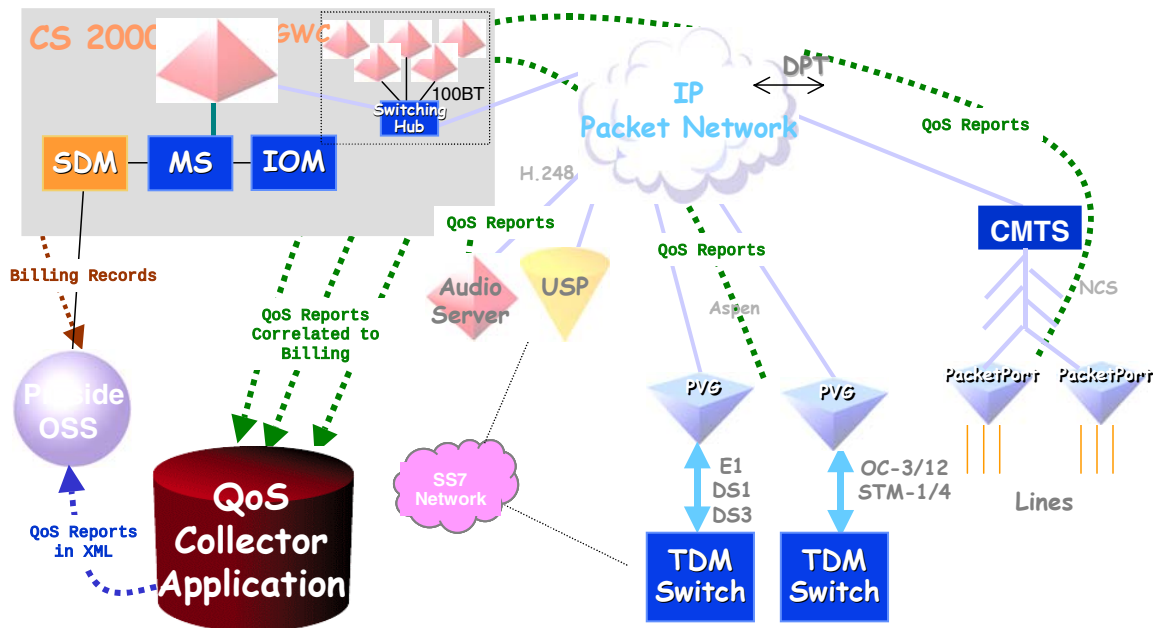
It is the purpose of this activity is to remove the discrepancies in the existing Log report instances

It is intended that the logs generated by the QCA application running on the SESM fulfill certain requirements.

- Software: Each log name/number must have 1 consistent format
- Software: Set and Clear logs must be unique to enable event correlation (For example if the Set and Clear use Location and Notification-ID tags the same Location and Notification-ID pair cannot be duplicated until after the log is cleared)
- Software: all set logs with a severity need to have a clear logs with no severity. If the same log name/number is used for the clear must have the exact same format. (As per #1.). The clear log can have a different format it must be a different log name/number.
- Software: The sequence number in log headers which is a tracking mechanism of lost logs must increment by 1. Downstream applications such as SDM Log Delivery Service and IEMS track this number and flag any lost log events (which is a bug/deficiency) to northbound OSSs.
- Documentation: All QCA logs need to be documented in customers' NTPs. Specifically, OSS Guide and Succession Log Reference Manual.

This is accomplished by ensuring

- all instances of each log report number have the same consistent format.
- Assigning new Log report number to achieve 1>
- All Logs which have a severity of Critical/Major/Minor are required to have a corresponding Clear Log. All instances which had a severity but didn't have a detectable mechanism (from within QCA's scope) to generate a corresponding Clear Log have been changed to have a severity of None.

**Figure 1 QoS Reporting in a VoIP Network****1.2.1 QCA customer logs**

In addition to QCA Error IPDR Records the QCA raises alarms and events via the customer logging stream.

The QCA uses the logging API introduced by activity 89008996 “Log Reporting and Storage Mechanism for Managed Elements”.

Prior to this feature the QCA had 9 different Log report numbers (total instances = 62). After this feature it will have 11 different Log report numbers (total instances = 62)

All the QCA customer log instances have been listed in the table below.

The newly introduced logs and the modified log instances are in bold.

## 1.3 QCA Customer logs

**Table 1 Service summary (initialization) warning logs**

| Event / Error                                                                  | Report Number | Priority | Event Type | Message/Description                                                                                                            | QCA Action   | Customer Action                         |
|--------------------------------------------------------------------------------|---------------|----------|------------|--------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------------|
| Qca.properties not available at QCA start-up.                                  | 201           | Warning  | INIT       | Properties file (properties/qca.properties) not available. QCA is starting with default settings.                              | Default used | None                                    |
| portNumber property not in properties/qca.properties at QCA start-up.          | 201           | Warning  | INIT       | portNumber property not in properties/qca.properties. QCA is starting with default port number of 20000                        | Default used | None                                    |
| portNumber property in properties/qca.properties not in range at QCA start-up. | 201           | Warning  | INIT       | portNumber property in properties/qca.properties not in range. QCA is starting with default port number of 20000               | Default used | None                                    |
| portNumber property in properties/qca.properties not a number at QCA start-up. | 201           | Warning  | INIT       | portNumber property in properties/qca.properties could not be used. QCA is starting with default port number of 20000          | Default used | None<br><br>Restore qca.properties file |
| MaxFileSize property not in properties/qca.properties.                         | 201           | Warning  | INIT       | MaxFileSize property not in properties/qca.properties. QCA is starting with default maximum file size of 1 MByte               | Default used | None                                    |
| MaxFileSize property in properties/qca.properties not in range.                | 201           | Warning  | INIT       | MaxFileSize property in properties/qca.properties not in range. QCA is starting with default maximum file size of 1 MByte      | Default used | None                                    |
| MaxFileSize property in properties/qca.properties not a number.                | 201           | Warning  | INIT       | MaxFileSize property in properties/qca.properties could not be used. QCA is starting with default maximum file size of 1 MByte | Default used | None                                    |
| MaxFileTime property not in properties/qca.properties.                         | 201           | Warning  | INIT       | MaxFileTime property not in properties/qca.properties. QCA is starting with default maximum file time of 15 minutes            | Default used | None                                    |

**Table 1 Service summary (initialization) warning logs**

| Event / Error                                                      | Report Number | Priority | Event Type | Message/Description                                                                                                               | QCA Action   | Customer Action |
|--------------------------------------------------------------------|---------------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------|
| MaxFileTime property in properties/qca.properties not in range.    | 201           | Warning  | INIT       | MaxFileTime property in properties/qca.properties not in range. QCA is starting with default maximum file time of 15 minutes      | Default used | None            |
| MaxFileTime property in properties/qca.properties not a number.    | 201           | Warning  | INIT       | MaxFileTime property in properties/qca.properties could not be used. QCA is starting with default maximum file time of 15 minutes | Default used | None            |
| RetainFileTime property not in properties/qca.properties.          | 201           | Warning  | INIT       | RetainFileTime property not in properties/qca.properties. QCA is starting with default retain file time of 5 days                 | Default used | None            |
| RetainFileTime property in properties/qca.properties not in range. | 201           | Warning  | INIT       | RetainFileTime property in properties/qca.properties not in range. QCA is starting with default retain file time of 5 days        | Default used | None            |
| RetainFileTime property in properties/qca.properties not a number. | 201           | Warning  | INIT       | RetainFileTime property in properties/qca.properties could not be used. QCA is starting with default retain file time of 5 days   | Default used | None            |
| recycleToD property not in properties/qca.properties.              | 201           | Warning  | INIT       | recycleToD property not in properties/qca.properties. QCA is starting with default recycle hour of day of 0                       | Default used | None            |
| recycleToD property in properties/qca.properties not in range.     | 201           | Warning  | INIT       | recycleToD property in properties/qca.properties not in range. QCA is starting with default recycle hour of day of 0              | Default used | None            |
| recycleToD property in properties/qca.properties not a number.     | 201           | Warning  | INIT       | recycleToD property in properties/qca.properties could not be used. QCA is starting with default recycle hour of day of 0         | Default used | None            |
| fileExt property not in properties/qca.properties.                 | 201           | Warning  | INIT       | fileExt property not in properties/qca.properties. QCA is starting with default file extension of xml                             | Default used | None            |
| oldFileCompression property not in properties/qca.properties.      | 201           | Warning  | INIT       | oldFileCompression property not in properties/qca.properties. QCA is starting with default value of true                          | Default used | None            |



**Table 1 Service summary (initialization) warning logs**

| Event / Error                                                                  | Report Number | Priority | Event Type | Message/Description                                                                                                               | QCA Action                                                  | Customer Action   |
|--------------------------------------------------------------------------------|---------------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------|
| oldFileCompression property in properties/qca.properties not true or false.    | 201           | Warning  | INIT       | oldFileCompression property in properties/qca.properties could not be used. QCA is starting with default value of true            | Default used                                                | None              |
| closedFileCompression property not in properties/qca.properties.               | 201           | Warning  | INIT       | closedFileCompression property not in properties/qca.properties. QCA is starting with default value of true                       | Default used                                                | None              |
| closedFileCompression property in properties/qca.properties not true or false. | 201           | Warning  | INIT       | closedFileCompression property in properties/qca.properties could not be used. QCA is starting with default value of true         | Default used                                                | None              |
| nodeName property not in properties/qca.properties.                            | 201           | Warning  | INIT       | nodeName property not in properties/qca.properties. QCA is starting with default value of QCA                                     | Default used                                                | None              |
| old file retention directory (today-x) is being removed.                       | 202           | None     | INIT       | File Recovery: removing closed file retention directory: <i>directory</i> as it is older than x days.                             | Directory removed                                           | None              |
| File found in active directory when QCA started.                               | 202           | None     | INIT       | File Recovery: file <i>file name</i> found in active directory. This could indicate that the QCA failed. Please check debug logs. | File completed (if necessary) and moved to today directory. | Check debug logs. |

**Table 2 Trouble logs**

| Event / Error                                       | Report Number | Priority | Event Type | Message                                                                                                                                                                              | QCA Action                  | Customer Action                   |
|-----------------------------------------------------|---------------|----------|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------|
| File handler or server socket could not be started. | 300           | None     | FAIL       | QCA not started: Could not open server socket: <i>+reason</i> or<br>QCA not started: Could not create File Handler: <i>+reason</i>                                                   | QCA not started             | Rectify problem and re-start QCA. |
| Out of sequence QoS record received.                | 302           | None     | FLT        | Out of Sequence QoS Record received. 'MGC Type MGC number': sequence number = ' <i>record sequence number</i> '<br>previous sequence number = ' <i>last record sequence number</i> ' | XML Error record generated. | None                              |

**Table 2 Trouble logs**

| Event / Error                                                          | Report Number | Priority | Event Type | Message                                                                                                                                                                                                                                                                                                                                                                                                                      | QCA Action                                                      | Customer Action                                                             |
|------------------------------------------------------------------------|---------------|----------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------|
| Problem processing binary QoS record.                                  | 302           | None     | FLT        | Problem processing binary QoS record: Sequence number = <i>'record sequence number'</i><br><br>Relevant MGC is mentioned in <i>Component ID</i> attribute of the log.                                                                                                                                                                                                                                                        | XML Error record generated. XML QoS Record not written to file. | None                                                                        |
| QoS Record received with Unsupported Length.<br>(Notification Id: 9)   | 301           | Minor    | FLT        | Location: <hostName> Notification ID: 9 State: Raise<br>Category:Processing Error Cause: Corrupt Data. Time:<time><br>Component Id: 'MGCType MGCNum' Specific Problem: The QCA has received records with < numberOfLengthErrors> length errors from the source.<br>Description: If 10 (or more) records with unsupported length are received consecutively, Major fault log is generated and the connection is closed.       | XML Error record generated. XML QoS Record not written to file. | Investigate why client is sent QoS Record with Unsupported Length           |
| 10 sequential QoS Records received with Unsupported Length.            | 301           | Major    | FLT        | Location: <hostName> Notification ID: 9 State: Raise<br>Category:Processing Error Cause: Version mismatch. Time:<time><br>Component Id: 'MGCType MGCNum' Specific Problem: 10 unsupported length records received. The connection to the client will be closed                                                                                                                                                               | Connection to client closed                                     | Investigate why client is repeatedly sending Unsupported Length QoS records |
| QoS Record received with Unsupported Version.<br>(Notification Id: 57) | 301           | Minor    | FLT        | Location: <hostName> Notification ID:57 State: Raise<br>Category:Processing Error Cause: Version mismatch. Time:<time><br>Component Id: 'MGCType MGCNum' Specific Problem: The QCA has received records with <NumberOfVersionErrors> version errors from the source.<br>Description: If 10 (or more) records with unsupported version are received consecutively, Major fault log is generated and the connection is closed. | XML Error record generated. XML QoS Record not written to file. | Investigate why client is sent QoS Record with Unsupported Version          |

**Table 2 Trouble logs**

| Event / Error                                                                                    | Report Number | Priority | Event Type | Message                                                                                                                                                                                                                                                                                                       | QCA Action                  | Customer Action                                                                                                                             |
|--------------------------------------------------------------------------------------------------|---------------|----------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| 10 sequential QoS Records received with Unsupported Version.                                     | 301           | Major    | FLT        | Location: <hostName> Notification ID: 57 State: Raise<br>Category:Processing Error Cause: Version mismatch.<br>Time:<time>Component Id: 'MGCType MGCNum' Specific Problem: 10 unsupported version records received.<br><br>The connection to the client will be closed.                                       | Connection to client closed | Investigate why client is repeatedly sending Unsupported Length QoS records                                                                 |
| The binary QoS Record header could not be processed.                                             | 305           | None     | FLT        | Connection closed: Error while processing QoS record header:<br><br>Client at, IP Address ' <i>client IP Address</i> '. Local Port ' <i>local port number</i> ' closed connection.                                                                                                                            | Connection to client closed | Investigate why client is sent QoS Record with faulty header<br><br>Investigate why client is sent QoS Record with unsupported message type |
| Disk space shortage, local disk requires more free space. Disk Space is below 100Mb.             | 310           | Critical | TBL        | Location: <hostName> Notification ID: 49 State: Raise<br>Category:Processing Error Cause: StorageCapacityproblem.<br>Time:<time>Component Id: /data/qca Specific Problem: checkDiskSpace() has shown that there is less than 104857600 bytes available on the local disk. More Space is required immediately. | None                        | More space must be created.                                                                                                                 |
| Disk Space is starting to run seriously low. This means that the available space is below 500Mb. | 310           | Major    | TBL        | Location: <hostName> Notification ID: 49 State: Raise<br>Category:Processing Error Cause: StorageCapacityProblem.<br>Time:<time>Component Id: /data/qca. Specific Problem:Less than 524288000 bytes available on the local disk.Critical alarm will be raised if disk space continues to drop.                | None                        | More space must be created.                                                                                                                 |

**Table 2 Trouble logs**

| Event / Error                                                                                                                                                                                                     | Report Number | Priority | Event Type | Message                                                                                                                                                                                                                                                                                      | QCA Action                           | Customer Action                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------|
| Disk space is below the minimum threshold. Initially set at 1Gb.                                                                                                                                                  | 310           | Minor    | TBL        | Location: <hostName> Notification ID: 49 State: Raise Category:Processing Error Cause: StorageCapacityProblem. Time:<time>Component Id: /data/qca. Specific Problem: Less than 1073741824 bytes available on the local disk. Major alarm will be raised if the disk space continues to drop. | None                                 | More space must be created.                                                     |
| A request to get a new file name has failed, there are either 10000 files with the same name or the new file can not be created.                                                                                  | 315           | Warning  | FLT        | Unable to get an unused file name for <fileName> Please check the output directory.                                                                                                                                                                                                          | file null.xml used                   | Output directories need to be checked.                                          |
| The QCA has failed to write the footer information to the active file whilst attempting to close. The active file might have been compressed without the footer information.                                      | 315           | Warning  | FLT        | Cannot write the FOOTER to the active file. This file is corrupted FileName = <fileName>.                                                                                                                                                                                                    | None                                 | Check the file and confirm that all XML tags have been closed.                  |
| The active file did not exist when trying to write to it. Attempt to get new file then failed. Further failures will result in the QCA being shutdown.                                                            | 315           | None     | FLT        | Active file <fileName> has been removed. Data may have been lost. Creating new file, and attempting to write record again. Failure to do so will result in shutdown of the QCA                                                                                                               | Attempts to create a new output file | File IO problems, if problem is resolved the Major alarm will be withdrawn.     |
| Attempting to write data to file, the active file does not exist. Try to get new file. This has failed. Sleep The thread and try and get new file again.This also failed. No file to write to, QCA will shutdown. | 315           | None     | FAIL       | Could not get new file to write records. File <fileName> is corrupted or removed. QCA shutting down.                                                                                                                                                                                         | QCA is stopped.                      | check: disk space and write permissions. If all is well try starting QCA again. |

**Table 2 Trouble logs**

| Event / Error                                                                                                                                                                                                   | Report Number | Priority | Event Type | Message                                                                                                                 | QCA Action                               | Customer Action                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------|------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------|
| The XML writer and the file all seem well, unfortunately the file cannot be accessed at in either the first or second attempt, serious problem with file IO. QCA will shutdown.                                 | 315           | None     | FAIL       | Could not write to the activefile. Active file exists but cannot write records to it. Reason unknown. QCA shutting down | QCA is stopped.                          | check: disk space and write permission s. If all is well try starting QCA again. |
| The QCA has encountered inconsistent errors when building the directory structure for old files, old files may have been deleted and directory locked. The error should never appear, as it is the last resort. | 315           | None     | FAIL       | Cannot create directories under <i>output</i> directory. Cannot write records. QCA shutting down                        | QCA is stopped.                          | Check: directory structure, active and old files.                                |
| Attempt to rename the active file from the active directory to the today directory has failed. Serious error, but no loss of data immediately. Files can be moved by hand if required.                          | 315           | None     | FLT        | Could not rename active file <fileName> to file <newFileName>. Please check write permissions for the output directory  | Closed file remains in active directory. | Check the directories exist and all the write permission s.                      |
| Could not create new active file. Data is being lost.QCA must shut down.                                                                                                                                        | 315           | None     | FAIL       | Could not get new file for writing. Critical Error: <reason>. QCA shutting down.                                        | QCA is stopped.                          | Check the active directory for old files and permission s.                       |
| Attempt to compress an old active file has failed.                                                                                                                                                              | 315           | None     | FLT        | Could not compress file: <fileName>. File compression failed.                                                           | None                                     | Check the active directory for old files and permission s.                       |

**Table 2 Trouble logs**

| Event / Error                                                                                                                    | Report Number | Priority | Event Type | Message                                                                                     | QCA Action                 | Customer Action                   |
|----------------------------------------------------------------------------------------------------------------------------------|---------------|----------|------------|---------------------------------------------------------------------------------------------|----------------------------|-----------------------------------|
| Failed to rename directories on the Recycle_day proc. This is where all files are moved along a level and the last gets deleted. | 315           | None     | FLT        | Could not rename director from <dirName> to <newDirName>. Check disk space and permissions. | None                       | Check disk space and permissions. |
| New GWC connection received.                                                                                                     | 322           | None     | INFO       | New GWC COnnection: 'MGC Type MGC number': sequence number = 'record sequence number'       | XML Error record generated |                                   |

**Table 3 Information and alarm clear logs**

| Event / Error                                                                                          | Report Number | Priority | Event Type | Message                                                                                                                              | QCA Action                  | Customer Action |
|--------------------------------------------------------------------------------------------------------|---------------|----------|------------|--------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------|
| Connection closed.                                                                                     | 305           | None     | INFO       | Connection closed.<br>Client at, IP Address ' <i>client IP Address</i> '. Local Port ' <i>local port number</i> ' closed connection. | Connection to client closed | None            |
| Client has stopped sending records with unsupported length<br>(clear for QCA 301 Notification Id: 9)   | 399           | None     | INFO       | Location: <Hostname> Notification Id: 9 State: Alarm Cleared Time: <time>                                                            | None                        | None            |
| Client has stopped sending records with unsupported version<br>(clear for QCA 301 Notification Id: 57) | 399           | None     | INFO       | Location: <Hostname> Notification Id: 57 State: Alarm Cleared Time: <time>                                                           | None                        | None            |
| Critical disk space issue cleared<br>(clear for 310 Critical Alarm)                                    | 399           | None     | INFO       | Location: <Hostname> Notification Id: 49 State: Alarm Cleared Time: <time>                                                           | None                        | None            |
| Major disk space issue cleared<br>(clear for 310 Major Alarm)                                          | 399           | None     | INFO       | Location: <Hostname> Notification Id: 49 State: Alarm Cleared Time: <time>                                                           | None                        | None            |

| Event / Error                                                     | Report Number | Priority | Event Type | Message                                                                                                                                                                                                                                                                                                                                                  | QCA Action                  | Customer Action |
|-------------------------------------------------------------------|---------------|----------|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------|
| Minor disk space issue cleared<br><br>(clear for 310 Minor Alarm) | 399           | None     | INFO       | Location: <Hostname> Notification Id: 49 State: Alarm Cleared Time: <time>                                                                                                                                                                                                                                                                               | None                        | None            |
| Event / Error                                                     | Report Number | Priority | Event Type | Message                                                                                                                                                                                                                                                                                                                                                  | QCA Action                  | Customer Action |
| QCA cannot be stopped                                             | 203           | None     | INIT       | Location: <Hostname> Category: PROCESSINGERROR Cause: CONFIGERROR Time: ComponentID: SpecificProblem: QCA not running on specified port: Description: Cannot stop QCA Action: Use query_qca command to determine the port QCA is running on. Make sure it matches with portNumber in qca.properties file."                                               | Connection to client closed | None            |
| QCA cannot be stopped                                             | 203           | None     | INIT       | Location: <Hostname> Category: PROCESSINGERROR Cause: CONFIGERROR Time: ComponentID: SpecificProblem: Missing qca.properties file. Description: Could not read properties. QCA cannot be stopped.Action:Restore qca.properties file.                                                                                                                     | None                        | None            |
| QCA cannot be stopped                                             | 203           | None     | INIT       | <b>Location:</b> <Hostname> <b>Category:</b> PROCESSINGERROR <b>Cause:</b> CONFIGERROR Time: <b>ComponentID:</b> <b>SpecificProblem:</b> Attribute portNumber missing from qca.properties while trying to stop QCA. <b>Description:</b> Cannot determine QCA port number to stop QCA . <b>Action:</b> Add portNumber information to qca.properties file. | None                        | None            |

| Event / Error         | Report Number | Priority | Event Type | Message                                                                                                                                                                                                                                                                                                                                                                                                           | QCA Action | Customer Action |
|-----------------------|---------------|----------|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|
| QCA cannot be stopped | 203           | None     | INIT       | <b>Location:</b> <Hostname> <b>Category:</b> PROCESSINGERROR <b>Cause:</b> CONFIGERROR <b>Time:</b> <b>ComponentID:</b> <b>SpecificProblem:</b> Incorrect portNumber specified in qca.properties. <b>Description:</b> Cannot determine QCA port number to stop QCA <b>Action:</b> Use query_qca command to determine the port QCA is running on. Make sure it matches with portNumber in qca.properties file.     | None       | None            |
| QCA cannot be stopped | 203           | None     | INIT       | <b>Location:</b> <Hostname> <b>Category:</b> PROCESSINGERROR <b>Cause:</b> CONFIGERROR <b>Time:</b> <b>ComponentID:</b> <b>SpecificProblem:</b> Out of range portNumber specified in qca.properties. <b>Description:</b> Cannot determine QCA port number to stop QCA. <b>Action:</b> Use query_qca command to determine the port QCA is running on. Make sure it matches with portNumber in qca.properties file. | None       | None            |
| Connection closed.    | 305           | None     | ERROR      | <b>Location:</b> <Hostname> <b>Category:</b> COMMUNICATIONS <b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> MSGTYPEERROR <b>Description:</b> Client at, IP Address: closed connection.                                                                                                                                                                                                             |            | None            |
| Connection closed.    | 305           | None     | INFO       | <b>Location:</b> <Hostname> <b>Category:</b> COMMUNICATIONS <b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> CONNECTIONCLOSED <b>Description:</b> Client at, IP Address: closed connection.                                                                                                                                                                                                         |            |                 |
| Connection closed.    | 305           | None     | ERROR      | <b>Location:</b> <Hostname> <b>Category:</b> COMMUNICATIONS <b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> HEADERERROR <b>Description:</b> Client at, IP Address: closed connection                                                                                                                                                                                                               |            |                 |



| Event / Error      | Report Number | Priority | Event Type | Message                                                                                                                                                                                                   | QCA Action | Customer Action |
|--------------------|---------------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------|
| Connection closed. | 305           | None     | INFO       | <b>Location:</b> <Hostname> <b>Category:</b> COMMUNICATIONS <b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> CONNECTIONCLOSED. <b>Description:</b> Client at, IP Address: closed connection |            |                 |
| Connection closed. | 305           | None     | INFO       | <b>Location:</b> <Hostname> <b>Category:</b> COMMUNICATIONS <b>Cause:</b> COMMSUBFAIL <b>Time:</b> <b>SpecificProblem:</b> nCONNECTIONCLOSED <b>Description:</b> Client at, IP Address: closed connection |            |                 |

## 1.4 Glossary

| Term        | Description                               |
|-------------|-------------------------------------------|
| <b>GW</b>   | Gateway                                   |
| <b>GWC</b>  | Gateway Controller                        |
| <b>IP</b>   | Internet Protocol                         |
| <b>QCA</b>  | QoS Collector Application                 |
| <b>QoS</b>  | Quality of Service                        |
| <b>SDM</b>  | SuperNode Data Manager                    |
| <b>SESM</b> | Succession Element and Subelement Manager |
| <b>SLA</b>  | Service Level Agreement                   |
| <b>SPM</b>  | Spectrum Peripheral Module                |
| <b>UTF</b>  | Universal Text Format                     |
| <b>VoIP</b> | Voice over IP                             |
| <b>XML</b>  | eXtensible Markup Language                |

## 1.5 References.

1. A89007819 QoS Collector Application
2. Activity 89007781 - QoS Reporting: Provisioning
3. A00008338 DE

4. Activity 89008996 - Log Reporting and Storage Mechanism for Managed Elements

## ***Product = CS 2000 TOPS***

### **A00007271--TOPS EOL for SN08**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP

#### **1.2 Description**

This feature addresses all activities needed to support the TOPS End Of Life (EOL) program through SN08, including the following:

- Disables the TOPS Position via the Enhanced TOPS Message Switch (ETMS) functionality.
- Disables the TOPS Operator Centralization (OC) via the ETMS functionality.
- Identifies usage of the OSSAIN Management Information System (MIS) in the TOPS EOL logs.
- Removes the tables, parms, and OM groups which are obsolete.

Upgrades to SN08 or higher will result in loss of functionality if proper conversions to replacement features are not performed prior to the upgrade.

#### **1.3 Hardware Requirements or Dependencies**

None.

#### **1.4 Software Requirements or Dependencies**

None.

#### **1.5 Limitations and restrictions**

A position using an ETMS for data connectivity to a host will not be able to RTS or login once the host is upgraded to SN08 or higher.

A remote using an ETMS for data connectivity to a host will not be able to send calls to that host once the host is upgraded to SN08 or higher.

A host using an ETMS for data connectivity to a remote will stop receiving calls from that remote once the remote is upgraded to SN08 or higher.

## 1.6 Interactions

Positions connected via ETMS must be replaced by IP positions prior to an upgrade to SN08 or higher.

TDM-OC links must be replaced by OC-IP links prior to an upgrade to SN08 or higher. **Any OCHOST or OCHOSTQ tuple which references a TDM-OC link will cause a TABXFR to halt if not replaced prior to such an upgrade.**

## 1.7 Glossary

| Term | Description                      |
|------|----------------------------------|
| EOL  | End Of Life                      |
| ETMS | Enhanced TOPS Message Switch     |
| IP   | Internet Protocol                |
| OC   | Operator Centralization          |
| MIS  | Management Information System    |
| TOPS | Traffic Operator Position System |

## 2: Fault Management for A00007271

### 2.1 Fault management strategy

Not applicable.

### 2.2 Fault management tools and utilities

Not applicable.

### 2.3 Logs

Log Title/Log ID: TEOL100

The TEOL100 log was added in CSP12 and patched back to CSP09. This feature merely adds a potential new line to the existing log.

#### 2.3.1 Format

If OSSAIN MIS is used during a week, a TEOL100 log will be generated at midnight the following Sunday with the “OSSAIN MIS” functionality listed (other functionalities may also be listed). For example:

```
TEOL100 mmmdd hh:mm:ss ssdd INFO TOPS End Of Life Notification
Use of functionality scheduled for removal:
  Functionality Used      Scheduled Removal
  -----
  OSSAIN MIS              SN10
```

### 2.3.2 Explanation

Description: A TEOL100 log identifies functionality no longer supported in an upcoming load. A log is generated only when a functionality is used while scheduled for removal within 3 releases. All such functionalities used in the previous week are listed in that week's TEOL100 log.

### 2.3.3 Field descriptions

**Table 1** Field descriptions

| Field              | Value      | Description                                                                              |
|--------------------|------------|------------------------------------------------------------------------------------------|
| Functionality Used | OSSAIN MIS | This field identifies the functionality that is scheduled for removal yet is being used. |
| Scheduled Removal  | SN10       | This field identifies the release in which the functionality is scheduled to be removed. |

### 2.3.4 Action

If there is a plan in place to transition off of the identified functionality prior to upgrading to the identified release (or beyond), then the notification logs can be ignored. If there is no such plan in place, then the next level of support should be contacted to initiate an appropriate transition plan.

### 2.3.5 Associated Operational Measurements or Performance Measurements

Unchanged.

### 2.3.6 Additional information

The log indicates only that the functionality was used one or more times in the previous week. It does not indicate when the functionality was used (i.e. the time of the log itself is not at all related to the time of usage), nor does it indicate the number of times it was used.

## 2.4 Alarms

Not Applicable.

## 2.5 Related documentation

A59036888 - TOPS EOL Succession Baseline

## 3: Configuration for A00007271

### 3.1 Hardware and Software Requirements

None.

### 3.2 Initial Configuration

Not applicable.

### 3.3 Office Parameters

The following office parameters have been deleted as of SN08:

- TOPS\_CROSS\_TEAM\_ROUTING (table OFCVAR)
- TOPS\_PASSWORD\_ENABLE (table OFCENG)

### 3.4 Upgrade Considerations

#### 3.4.1 Dump and Restore

This section documents the behavior of certain tables over an ONP from a pre-SN08 load to an SN08 load (or higher).

##### 3.4.1.0.1 Table TMSOCDL

All tuples datafilled in table TMSOCDL will be dropped.

##### 3.4.1.0.2 Table OCGRP

All tuples datafilled in table OCGRP as LAPD (indicating ETMS) will be dropped.

##### 3.4.1.0.3 Table VLMEM

All tuples datafilled in table VLMEM which reference a LAPD tuple in OCGRP will be dropped.

##### 3.4.1.0.4 Table OCHOST

*A tuple datafilled in table OCHOST which references a LAPD tuple in OCGRP will halt the table transfer.*

##### 3.4.1.0.5 Table OCHOSTQ

*All tuples datafilled in table OCHOSTQ which reference a LAPD tuple in OCGRP will halt the table transfer.*

##### 3.4.1.0.6 Table TQMSFCQA

*All tuples datafilled in table TQMSFCQA as SA (in the ASSTAREA field) will halt the table transfer.*

##### 3.4.1.0.7 Table TOPSPOS

All tuples datafilled in table TOPSPOS as TMS (indicating ETMS) will be dropped.

#### 3.4.1.0.8 Table PARSMBR

All tuples datafilled in table PARSMBR which reference a TMS tuple in TOPSPOS will be dropped.

### 3.4.2 Element Management Upgrade

Not applicable.

### 3.4.3 Downgrade impact

None.

## 3.5 Data Schema

### 3.5.1 New/modified tables

Table 1 New or modified tables

| Table/MIB name | NEW/CHANGED/ or DELETED/ | Table Control (NEW/OLD/UNCHANGED) |
|----------------|--------------------------|-----------------------------------|
| ARUIBMRT       | DELETED                  | N/A                               |
| DUAQOPT        | DELETED                  | N/A                               |
| DQMODEM        | DELETED                  | N/A                               |
| HOICDEV        | DELETED                  | N/A                               |
| OPRDAT         | DELETED                  | N/A                               |
| SAQSIZE        | DELETED                  | N/A                               |
| TOPSPARM       | CHANGED                  | UNCHANGED                         |
| VSNOPT         | CHANGED                  | UNCHANGED                         |
| VROPT          | CHANGED                  | UNCHANGED                         |
| OCGRP          | CHANGED                  | UNCHANGED                         |
| TOPSPOS        | CHANGED                  | UNCHANGED                         |
| OCHOSTQ        | CHANGED                  | UNCHANGED                         |
| TQMSFCQA       | CHANGED                  | UNCHANGED                         |
| TMSOCDL        | CHANGED                  | UNCHANGED                         |
| TQOGTKEY       | CHANGED                  | UNCHANGED                         |

### 3.5.2 Table information

The following tables have been deleted as of SN08:

- ARUIBMRT

- DUAQOPT
- DQMODEM
- HOBICDEV

The following tables have been deleted as of SN08:

- OPRDAT
- SAQSIZE

#### **3.5.2.1 Name: TOPSPARM**

The following parms have been removed as of SN08, and cannot be re-added:

- LANG\_ERROR\_SCREEN\_DISPLAY
- ADAS\_ENABLE

The following parms have been removed as of SN08, and cannot be re-added:

- SA\_QUEUEING\_BY\_REQUEST\_AGE

#### **3.5.2.2 Name: VSNOPT**

The following parms have been removed as of SN08, and cannot be re-added:

- OPR\_0PLUS\_3RD\_DISPLAY
- OPR\_0PLUS\_COL\_DISPLAY
- OPR\_0PLUS\_3RDCON\_DISPLAY
- OPR\_0PLUS\_CLDCON\_DISPLAY

#### **3.5.2.3 Name: VROPT**

The following parms have been removed as of SN08, and cannot be re-added:

- DA\_BP\_HOTEL\_ROOM\_REQUIRED

The following parms have been removed as of SN08, and cannot be re-added:

- TOPSACD\_DASERV\_INSTANCE
- TOPSACD\_INTCserv\_INSTANCE

#### **3.5.2.4 Name: OCGRP**

All tuples with a DLSEL (within the DLOVRLAY field) of LAPD will be removed as of SN08, and cannot be re-added.

#### **3.5.2.5 Name: TOPSPOS**

All tuples with a DATATYPE (within the DATAPATH field) of TMS will be removed as of SN08, and cannot be re-added.

#### **3.5.2.6 Name: OCHOSTQ**

As of SN08, all tuples which have a REROUTESEL of Y will have VLTHROTL removed from their REASONS set (if it is present). If a REASONS set contains only VLTHROTL, then the REROUTESEL will be set

to N and the ALTHOST will be removed. VLTHROTL cannot be re-added to a REASONS set.

#### **3.5.2.7 Name: TQMSFCQA**

All tuples with an ASSTTYPE (within the ASSTAREA field) of SA cannot be added as of SN08.

#### **3.5.2.8 Name: TMSOCDL**

All tuples will be removed as of SN08, and cannot be re-added.

#### **3.5.2.9 Name: TQOGTKEY**

A tuple with a KEYTYPE (within the KEYINFO field) of ASST will be removed as of SN08, and cannot be re-added.

### **3.6 Service Orders**

Not applicable.

### **3.7 Software optionality control (SOC)**

Not applicable.

### **3.8 Element Management**

Not applicable.

### **3.9 User interface changes**

Not applicable.

### **3.10 OSSGate Interface Changes**

Not applicable.

### **3.11 Security**

Not applicable.

### **3.12 Configuration Walkthrough**

Not applicable.

## **4: Performance for A00007271**

### **4.1 Performance management strategy**

Not applicable.

### **4.2 Performance management tools and utilities**

Not applicable.



## 4.3 Performance Measurements (PM), Operational Measurements (OM), and stats

### 4.3.1 OM groups removed

The following TOPS OM groups have been removed as of SN08:

- DUAQ
- DUAQMOD

The following TOPS OM groups have been removed as of SN08:

- TOPSPSZ

### 4.3.2 OM group TOPSALT changed

The ALTVL register has been removed from the TOPSALT OM group as of SN08. The ALTDEF, ALTOFL, ALTDL, and ALTTOT registers are unchanged, although the ALTTOT register will now appear on the same line as the others.

Previously, a tuple was displayed within OM group TOPSALT if and only if the corresponding call queue was datafilled in table OCHOSTQ. As of SN08, a tuple is displayed within TOPSALT if and only if the corresponding call queue is datafilled in OCHOSTQ **with a REROUTESEL (within the RRDATA field) of Y**. Tuples with a REROUTESEL of N do not specify an alternate host, and hence cannot generate a peg in TOPSALT for that call queue.

### 4.3.3 OM group TOPSOC changed

The OCMCCS register has been removed from the TOPSOC OM group as of SN08. The OCINI and OCQABN registers are unchanged.

***Product = CS 2000 TOPS***

## **A00007713--TOPS-IP Robustness**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

PT-IP, DMS

#### **1.2 Description**

The feature enhances the TOPS-IP product with the following:

- A TOPS615 information log indicating operator teams and number of positions in each team using voice auto-compression is created.
- The post command in the mapci;mtc;appl;topsip;topspos level is enhanced to create a post set of all in service IP positions with auto-compression on. The listset command displays the positions in the posted set. The info command in the mapci;mtc;appl;topsip;topspos level is enhanced to display the auto-compression status for the posted position.

## 1.2.1 Background

IP positions typically select the G.711 voice packet protocol as long as voice quality (latency, jitter, packet loss) is acceptable. When facilities are lost or data network equipment fails, and the available bandwidth is less than that required for IP positions, network performance degrades (that is, packet loss and jitter increase). IP positions detect the network quality degradation and will go into the voice auto-compression mode selecting G.723 protocol on the next call. Once auto-compression is entered, the position remains in that mode for approximately four hours.

## 1.2.2 New Functionality

### 1.2.2.1 TOPS615 Log

The IP position sends an auto-compression message to TOPS to indicate the position has voice auto-compression turned on. When the position exits the auto-compression mode, an auto-compression message indicating off is sent.

The TOPS615 information log is generated indicating the operator teams and the number of positions in each team with auto-compression turned on. The log is generated if an auto-compression message has arrived during an approximate 5 minute audit period. It is also generated if an IP position with auto-compression turned on goes through a service affecting state change (i.e. bsy). Once auto-compression has been turned off for all positions, the log indicates no operator teams or positions have auto-compression on.

### 1.2.2.2 TOPSPOS MAP Post / Info Commands

The mapci;mtc;appl;topsip;topspos post command has parameter 'AC' added. When used, this parameter creates a post set of all in service IP positions with voice auto-compression turned on. The listset command is then used to display the position list.

The mapci;mtc;appl;topsip;topspos info command is enhanced to display the auto-compression status for the posted position.

## 1.3 Hardware Requirements or Dependencies

None

## 1.4 Software Requirements or Dependencies

- TOPS base functionality, SOC option OSB00101

## 1.5 Limitations and restrictions

- The auto-compression status of IP positions is not maintained during the One Night Process norestartswact. The auto-compression status is turned off for all IP positions after the norestartswact.
- If the auto-compression message indicating auto-compression has been turned off is lost, manual intervention (i.e. bsy) may be required to update the auto-compression status.
- If the auto-compression message indicating auto-compression has been turned on is lost, the auto-compression status in the switch is not updated to indicate an on status. In this event, the RAMP position may be utilized verify the auto-compression status.
- The IP position software must be capable of sending the auto-compression message.

## 1.6 Interactions

TOPS-IP positions send TOPS an auto-compression message indicating if auto-compression is on or off.

## 1.7 Glossary

| Term | Description                             |
|------|-----------------------------------------|
| IP   | Internet Protocol                       |
| MAP  | Maintenance and Administration Position |
| RAMP | Remote Access Maintenance Position      |





# SN08 Feature Deltas

***Product = Centrex IP Client Manager (CICM)***

## **A00003953--Active Call Fiber**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

CHS

#### **1.2 Description**

On a GigE MG9The Dual-Node Redundancy feature implemented in SN06.2 took the first steps in shifting the CICM's architecture away from a load-sharing model to one with a master-slave relationship. However, DNR restricted itself to implementing takeover redundancy on the northbound interface (i.e. H.248) only. The south-side of the CICM continued to maintain its load-sharing capacity allowing terminals to connect to either node. The obvious implication of this is that on failure of a node, while communication to the GWC is maintained, all terminals hosted off the defunct node experience an outage they reboot and reconnected to the mate.

The Active Call Failover feature aims to address this shortcoming by completing the shift away from a load-sharing model on the terminals interface to one of full takeover redundancy. With ACF, all terminals connect to of the CICM., the mate assumes the role of the master and begins the recovery of terminals while maintaining active calls.

The ACF feature is developed and tracked as 4 separate sub-activities. Each activity tracks a somewhat independent component. Together, the 4 activities each contribute to the overall ACF feature.

The 4 sub-activities and software components are:

- A00003953 – Base
- A00007637 – Authority

- A00007619 – Call Processing
- A00007639 – OAMP

Although this document is maintained under the A00003953 activity, it applies equally to all 4 activities listed above.

### 1.3 System Description

Figure 1 shows the relationships between software components of the CICM as they interact in SN06.2 following the implementation of Dual Node Redundancy.

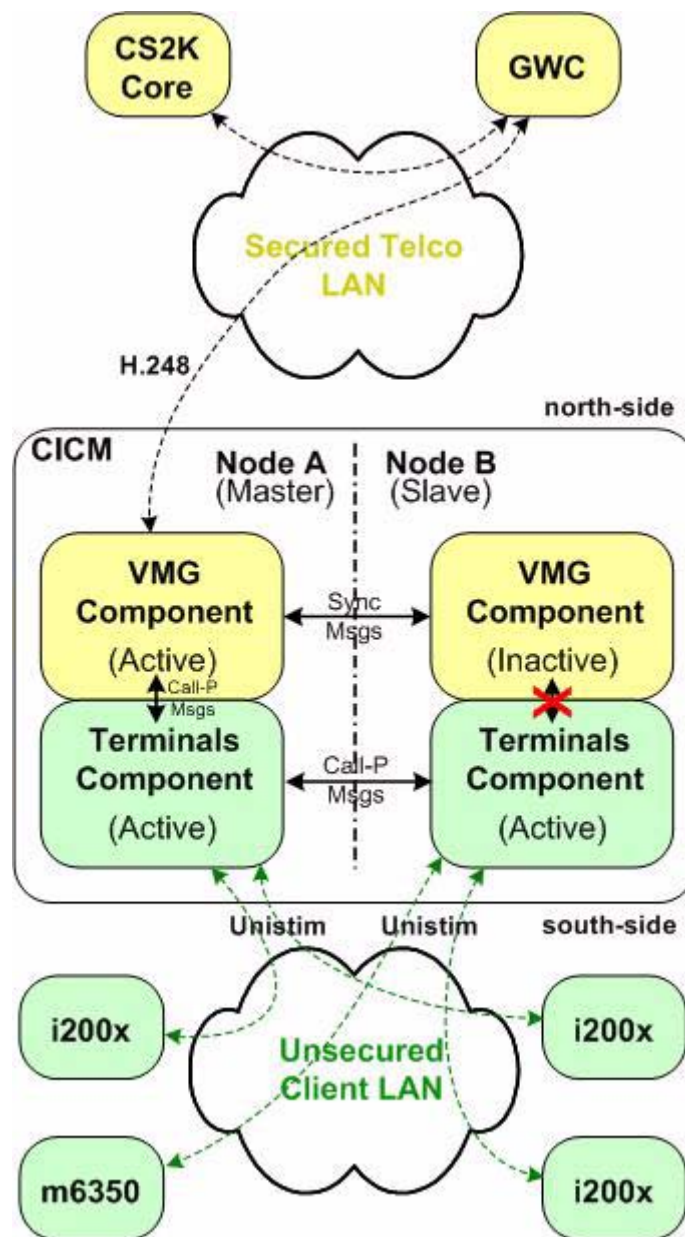


**Figure 1 The pre-ACF CICM**

The figure shows that communication to the GWC (with H.248) is provided by a single active interface managed by the master node. However, communication to the terminals takes place equally on both nodes regardless of which node is the master. Each node presents its own interface (or IP address) to the terminals.

Figure 2 illustrates the overall architecture of the CICM with ACF. The significant differences from Figure 1 are highlighted in italicised red.

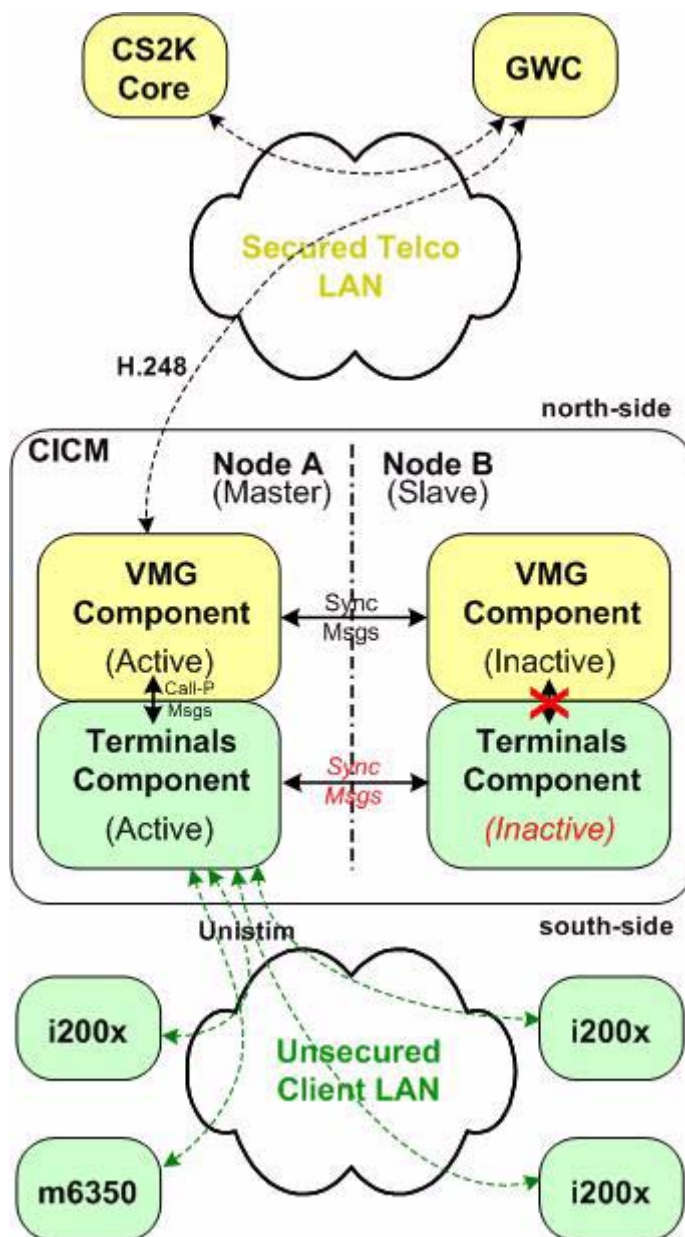


**Figure 2 The ACF CICM**

As shown, the north-side of the CICM continues to communicate with the GWC using the H.248 protocol via a single interface. This remains consistent with the SN06.2 behaviour.



However, Active Call Failover changes the CICM's architecture such that the south side now also presents a single, but unique interface. Terminals no longer have an option to connect to one node vs. the other as in SN07. Instead, they are now only aware of a single IP address towards which all Unistim messaging must be directed. This address is bound to the master node.

Thus both the H.248 and Unistim interfaces each make use of own "floating" IP address that is bound dynamically to the master node's interface. Each component shown in Figure 2 is responsible for managing its floating address and to ensure it is swapped to the mate on a switch of activity.

The inactive VMG component keeps in constant near-full synchronisation with the active side. The double-headed arrow connecting these components on both nodes of the CICM illustrates this. This is necessary to ensure that both nodes have an accurate view of the state of call processing at anytime thus allowing the inactive side to take over control of these functions on a switch of activity.

As for the Terminals component, the also maintains a state of synchronisation with the . However, the level of this synchronisation is kept to a minimum for various reasons that are outside the scope of this document. The impacts and limitations of this minimal synchronisation will be addressed in more detail in the sections that follow.

### 1.3.1 Switch of activity

A switch of activity (or SWACT) occurs when the role of the master is transitioned from one node to the other. From Figure 2, this implies that following a SWACT, communication with the GWC and the terminals is maintained by the newly promoted master (in this case node B). This is illustrated in Figure 3.

As perhaps suggested by the figures, a platform switch of activity is carried out internally one component at a time. The process begins with the VMG and ends with the Terminals component. It is therefore possible that as the switch of activity is in progress, one node may find itself hosting the active VMG component while simultaneously hosting the inactive Terminals component.

However, such a state is transient and there is no facility for the operator to selectively choose to SWACT an individual component over another or stop the maintenance action mid-stream once initiated. By definition, a switch of activity is carried out atomically over the entire platform such that once completed, both nodes will have entirely exchanged roles.

As part of the SWACT, it is the responsibility of the CICM to ensure that the floating H.248 and Unistim IP addresses are moved to the newly promoted master. This is necessary in order to ensure continued communication with both the GWC and terminals as illustrated.

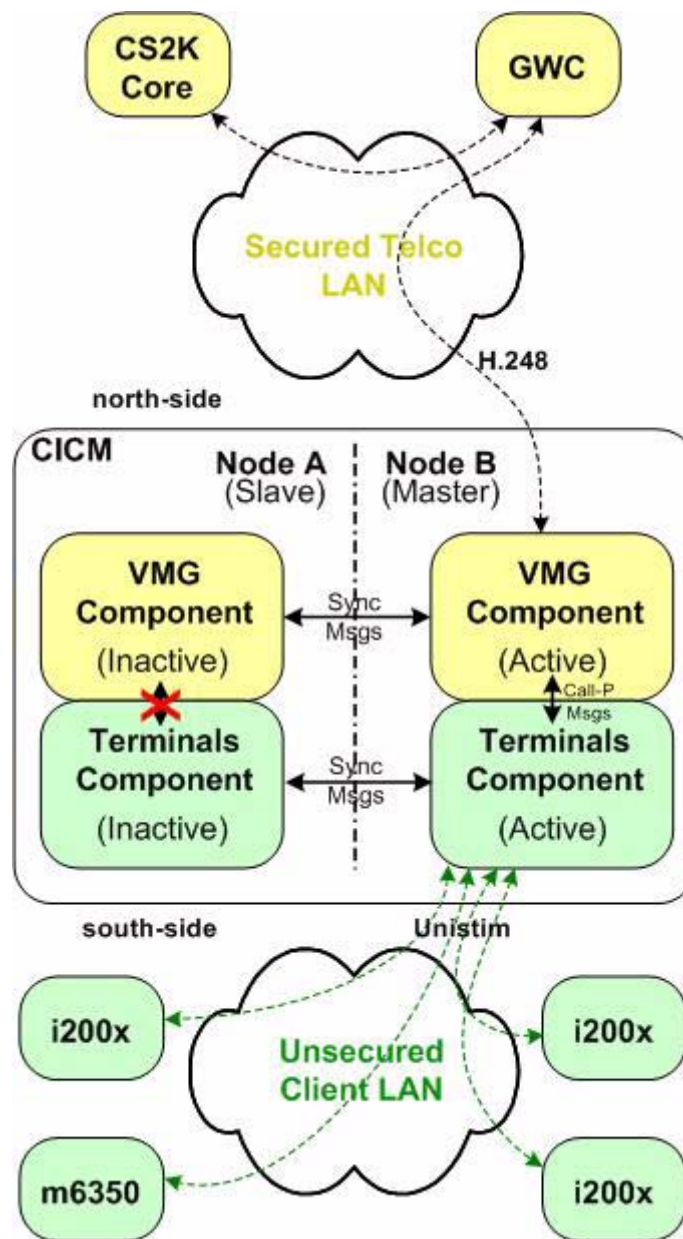


**Figure 3 The CICM following a switch of activity**

A SWACT is said to be "controlled" when initiated manually by the operator. Following a controlled SWACT, the master and slave nodes assume the other's previous role. A manual SWACT is generally executed in order to perform maintenance activities.

An uncontrolled SWACT is autonomously initiated by the system on failure of the master node. No immediate operator intervention is required for the slave node to assume the role of the master in such a circumstance.

### 1.3.2 Technical details of a switch of activity

A switch of activity requires a number of actions to be performed before it can be considered completed. In the context of ACF, some of these actions can be lengthy. This section aims to provide a summary of what occurs on a SWACT in order to help highlight and explain the reasons behind some of the durations stated later.

The first thing to understand is that each component of the CICM switches its activity rather independently of the other components in the system. Only once a component reports that it has completed its SWACT does the system proceed on to the next. Once all components have switched activity, a final step is performed allowing all new master components to complete any needed clean-up activities.

On the CICM, this translates to the following steps:

- 1 The system detects the need for a switch of activity
- 2 The VMG component undergoes a switch of activity
- 3 The Terminals component undergoes a switch of activity
- 4 Each component gets a chance to perform clean-up actions
- 5 The system marks the switch of activity complete

Note that, implicitly, the steps just listed mean that for some time between steps 2 and 3, each node finds itself running one but not all components.

### 1.3.3 Virtual Media Gateway

The VMG component is the first to switch its activity. The process to SWACT this component has ACF and remains unchanged since it was first implemented for DNR (). In short, the component unbinds and simply hands off ownership of the floating H.248 address to the component. The (), binds the address and resumes communication with the GWC thus taking over the call processing role.

Although the switch of activity of the VMG component is short, during the switch only "stable" calls are guaranteed to survive. Unstable calls may or may not survive.

A stable call is defined as a call in which the parties have achieved the talking state and for which no user interaction is in progress. Anything else is considered to be an unstable call. The following list provides a few examples

of possible problem cases that could occur during a SWACT of the VMG component:

- 1 A call in the middle of being setup may not terminate and could be lost.
- 2 A user interacting with a feature such as setting up a 3 way call could find herself losing both parties should a SWACT occur before speech path is established between all parties.
- 3 General terminal stimulus could be lost during a SWACT that could in turn lead to a misdialled call.

### 1.3.3.1 Terminals

Once the VMG has completed its switch of activity, the system begins the Terminals component SWACT. Similarly, the component unbinds and simply hands off ownership of the floating Unistim address to the component. The binds the address thus assuming the role of the . This is where similarities to the VMG SWACT end.

In order to understand what the new Terminals component does next, it helps to understand some of the details about the nature of the communication between the CICM and its terminals.

When a terminal first boots up, it sends an initial Unistim message to the CICM to advise it that it wishes to establish a session. As part of the initial exchange, the CICM and terminal agree on some sequence numbers to use.

Sequence numbers are part of RUDP's inbuilt retransmission mechanism and serve to ensure that neither party loses any messages. By sequentially numbering each message the CICM sends to the terminal, the terminal can easily determine the sequence number (and therefore message) it is meant to process next. This mechanism naturally allows it to detect the loss of any messages. CICM to terminal messages use one set of sequence numbers while terminal to CICM messages use a different set of numbers.

Due to the large number of terminals that the CICM supports, it is not possible for the Terminals component to actively sync across to its mate each terminal's sequence number for each Unistim message it exchanges with the terminal. This approach would be impractical and would be much too real-time intensive.

As a result, the Terminals component syncs only the minimal set of information needed for its counterpart to actively recover the terminal on a switch of activity.

Therefore, after the new Terminals component has bound the Unistim floating IP address, it begins actively recovering each terminal in order to re-learn the sequence numbers that the terminal expects to use (RUDP provides a

mechanism for this). As the CICM supports a large number of terminals, such an operation can take a while to complete. Refer to section 7 for details on timing.

Between the time that the Unistim floating address is moved and a terminal has been recovered, the CICM has effectively lost its virtual connection to the terminal. However, so long as the terminal does not attempt to communicate with the CICM during this time, it remains unaware of the lost connection. Should it be a in a call, it takes no notice of this situation and continues happily transmitting and receiving audio (RTP and RTCP). Neither party in the call experiences an outage or interruption in the audio stream. Likewise, the core is also unaware of this temporary situation so billing is unaffected.

Naturally, the CICM's goal is to recover all terminals. However, due to the terminal watchdog mechanism, it must do this quickly before any terminal times out and reboots.

A quick recap of this mechanism seems in order. The keep-alive is driven by the Terminals component and periodically sends a message to each terminal effectively telling it to "Reboot in N seconds". Although N currently defaults to 120 seconds, it is configurable. Therefore, if the CICM fails to send a subsequent "Reboot in N seconds" message before the timer expires, the terminal reboots and attempts to reconnect.

Thus, in order to maximise its chances of recovering all terminals before any reboot, the Terminals component begins recovery with the terminal that was least recently sent the "Reboot in N seconds" message and progresses the recovery in this order. Assuming the current default, the Terminals component must recover all terminals within 2 minutes.

As suggested earlier, while the recovery process is executing, it is important to consider that external events may occur. Two types of events could occur between the time the Unistim floating address is transferred and an individual terminal is recovered:

- 1 A Unistim message is received from the terminal itself
- 2 A call processing event destined for the terminal is received from the GWC

The first event type can originate from simple user interaction with the terminal. This could be anything from going on hook, switching between calls (streams) or simply changing some user settings (in the case of a i200x ). In order to avoid the terminal rebooting and to give the user as responsive feedback as possible, the session is placed at the head of the queue for immediate recovery.

Because of this support for early recovery, no user generated events are lost during the SWACT of the Terminals component. However, as the recovery introduces a delay before the user's input may be acted upon, a delay in the response to the first few key events should be expected.

The second event type would most typically occur due to interaction of the user at the far end. In such cases, the resulting events from the GWC see an update to the VMG component's state for the terminal, but any resulting events are not propagated down to the Terminals component or the terminal. Such state updates do not occur until the terminal is later recovered as per the normal recovery mechanism.

This may result in some unexpected behaviour at times. Consider the case in which the far end user goes on-hook. If this state change is not propagated to the terminal, it continues sending RTP (audio) until the recovery occurs. Of course, in this scenario, the most likely outcome is that the local user would also go on-hook thus bringing us back to the first event type (an immediate recovery thus causing the stream to be closed).

Consider a much less likely, but more problematic scenario of the far end attempting a CODEC renegotiation, an update of the destination IP address and/or port, etc. In this case, the VMG component successfully updates its state for the terminal and acknowledges the successful completion of the request to the GWC. The far end then starts using the new parameters. Until the terminal is recovered and its parameters updated, this situation would likely result in one way speech or none at all.

The last point worth mentioning about a system SWACT is that once initiated, it cannot be stopped or aborted. This restriction follows naturally once the effort required to recover individual terminals is considered.

Once the master Terminals component releases the floating Unistim address, all terminals **MUST** be actively recovered. Allowing a SWACT to be aborted could see the floating IP address easily returned to the original node without problem, but then the terminals recovery would once again need to be restarted. Given the minimal window available to recover all terminals without having any of them timeout and reboot, the additional delay introduced by an abort would surely result in a loss of some (and possibly many) terminals.

As a result, should a failure of the master node occur while terminal recovery is in progress, it follows that an autonomous SWACT must occur to attempt and recover the situation as best as possible. In this rare case, it cannot be guaranteed that some terminals will be recovered. These terminals would likely reboot and any calls hosted lost.



## 1.4 System start and stop

This section describes the behaviour that can be expected from the CICM in normal circumstances during start and stop scenarios.

### 1.4.1 First node start-up (master)

As the first node of the CICM initialises and begins operation, it broadcasts periodic heart beat messages on its private admin LAN directed to its mate node. As it does not observe corresponding heartbeats from its mate, it assumes the role of the master.

The north-side binds the floating H.248 address begins sending H.248 messages to the GWC advising it when it is available for service. A number of initialisation messages are exchanged between the CICM and the GWC. Meanwhile the south-side likewise binds the floating Unistim address and begins accepting incoming connections from terminals.

Once in service, users at connected terminals may login, make and receive calls and also use other available CICM services.

### 1.4.2 Second node start-up (slave)

As the second node initialises, it also begins broadcasting periodic heartbeats directed to its mate. As the master is already broadcasting, notice and assumes the role of the slave.

Both the VMG and Terminals components are advised by the system to initialise as slaves. The VMG therefore does not begin communicating with the GWC and the Terminals component does not expect incoming connection requests from terminals.

Instead, the VMG requests a bulk synchronisation of all call processing data from its mate and the Terminals component makes a similar request from its counterpart. Once these operations are completed, each component on the master node continues dynamically sending synchronisation information to keep the corresponding components constantly up to date on the mate node.

Only when all software components have started and the bulk synchronisations have completed is it possible to initiate a switch of activity.

### 1.4.3 Manually stopping a node

A node may be stopped or restarted using the element manager's maintenance page. For the purpose of our redundancy discussion, both actions are effectively equivalent and are therefore treated as such in software. For simplicity we will therefore always refer to a system stop and simply ignore node restarts.

Three scenarios exist:

- Both nodes are running; Operator stops slave

- Both nodes are running; Operator stops master
- Only master is running; Operator stop master

Ultimately, these 3 scenarios are treated exactly as failures of the respective nodes. No special processing is done to automatically initiate a SWACT even though such an action may be desirable. It is the responsibility of the operator to ensure that the node is in the desired state before initiating a node stop.

However, initiating the stop from the CICM element manager verifies such things and presents the operator an appropriate warning message with recommended courses of action in order to minimise any impact on service.

## 1.5 Node failures

Only two interesting scenarios exist. We are interested in the case where both the master and slave nodes are running and one or the other of the following occurs:

- The master node fails
- The slave node fails

The only other case in which a failure is possible is that of a node running in standalone mode and subsequently fails. In this case, as the node is running on its own, it would of course have already assumed the role of the master. However, this case is uninteresting simply because if the node fails, no action can be taken. There is no redundant node to fall back on.

A "node failure" may have any number of possible causes. The term applies equally to both hardware failures of the physical CPU card running the CICM load or to some critical software error for which no recovery action is possible. The following is a non-exhaustive list of just some of possible node failures:

- Should any of the software components that make up the CICM load experience a software exception (i.e. trap), monitoring software automatically initiates an immediate restart of the node.
- A general failure of the CPU card

From the remaining node's perspective, the above cases are identical in that its mate suddenly stops providing heartbeats. The surviving node thus takes appropriate action as described in the following sections.

All but LAN adapter failures are treated equally by the redundancy functionality. When physically possible, any critical failure will result in the node automatically restarting a preset number of times (default is 3) that can be configured by the operator. Following the last restart, the boot controller will not start the CICM software load.



### 1.5.1 Master fails

When the master node experiences an unexpected failure, the slave node detects it and performs autonomous switch of activity to assume the role of the master.

The SWACT occurs transparently to the GWC as the new VMG component binds the floating H.248 IP address. Some inbound messages from the GWC may be lost during the takeover, but the retransmission algorithm built in to H.248 ensures that they are eventually delivered. However, during this component's SWACT, only "stable" calls are guaranteed to survive. Unstable calls may or may not survive.

Likewise, the switch of activity occurs semi-transparently to the terminals as the new Terminals component binds the floating Unistim IP address. We say "semi-transparently" because the Terminals application must now proceed to recover the individual terminals as previously described. Despite this recovery procedure, the end user experiences no loss of any currently active stable calls.

### 1.5.2 Slave fails

When the slave node experiences an unexpected failure, the master detects it, but does nothing except make note of the failure. No SWACT occurs and so no H.248 messages from the GWC are lost and no terminal recovery actions are required. All stable and unstable calls survive the failure on this node.

## 1.6 Network adapter failures

As hinted in the previous section, LAN adapter failures on the CPU cards are treated differently to other types of failures. These cases call for special consideration.

Before continuing, it is worth defining the difference between a node's critical and non-critical adapter. A node's critical physical adapter hosts both the H.248 and Unistim interfaces when it is the master. Therefore, on a given node, the floating IP addresses can only ever be bound to the critical adapter.

The critical adapter also hosts one of the Admin LAN interfaces able to support cross node communication. The non-critical physical adapter simply hosts a second Admin LAN interface thus providing redundant cross-node communication paths.

### 1.6.1 Master loses critical adapter

When the master node detects that it has lost layer-2 connectivity on its critical adapter, the master initiates an autonomous SWACT. This is done in order to conserve connectivity to the GWC and terminals thus maintaining call processing.

In such an event, all terminals are transferred to the newly promoted master node (previously slave). As always, unstable calls may experience problems on SWACT of the VMG component.

### 1.6.2 Master loses both adapters

In the event that the master detects layer-2 loss of connectivity on both its physical adapters, it decides that it is at fault and demotes itself to a slave-like state. The actual slave of course considers the master to have failed and promotes itself to master.

When either of the isolated node's adapters becomes available, it looks for its mate. If found, the node restarts itself in order to come up afresh as the slave and ensure that all its MIB data is synchronised with the master node.

If upon regaining either physical adapter the node does not find a mate, it re-promotes itself to master and proceeds accordingly. Appropriate monitoring software ensures that only one node is ever master at any given time.

In case, terminals hosted of this node lose their connection when the adapters are first lost. Communication to the terminals and GWC (if the node resumes its role as master) can of course only be re-established if the critical adapter is regained.

### 1.6.3 Slave loses critical adapter

Should the slave node lose layer-2 connectivity on its critical adapter, it simply updates its own local state and advises the master node of the state change. This is necessary in order to ensure that a SWACT is not inadvertently initiated either manually or autonomously. No switch of activity occurs.

### 1.6.4 Slave loses both adapters

In the event that the slave detects layer-2 loss of connectivity on both its physical adapters, it acts almost exactly as described previously. The only difference being that the node does not need to demote itself. It is already the slave.

## 1.7 Hardware and Software Requirements

### 1.7.1 Hardware requirements

Active Call Failover introduces no new hardware dependencies or requirements. However due to the redundancy nature of ACF, it is of course necessary for the 8.10 CICM software load to be installed on a *pair* of matching CPU cards.

The 8.10 load is supported on:

- Motorola 5370 CPU cards in a SAM16 chassis, or
- Motorola 5385 CPU cards in a SAM21 chassis

## 1.7.2 Software requirements

Active Call Failover is introduced in the 8.10 CICM release (SN08). This load level must therefore be installed on a pair of CPU cards (as listed above) in order to take advantage of the functionality.

The 8.10 CICM release introduces no special requirements on either the m6350 or the i200x terminals (or their firmware). The latest available and supported versions of the client software ships as part of the CICM release

## 1.8 Maintenance Aspects

### 1.8.1 Initial Installation and Configuration

The initial installation process of the 8.10 CICM remains largely unchanged from 7.20.

Active Call Failover introduces changes to 2 preboot steps run at install time.

#### 1.8.1.1 Unistim VLAN

As mentioned earlier, the main goal of ACF is to provide only a single IP address to which all terminals connect for service. This requires a change to the “Unistim VLAN” configuration step. When this step is reached, it prompts:

```
Enter the Floating Unistim IP address for this CICM:
```

As the question suggests, instead of expecting a different static IP address for each node, preboot now asks for the single floating Unistim address that is to be shared. The user is expected to enter the same information on both nodes of the CICM. Failing to do so will lead to erroneous behaviour.

Next, preboot asks:

```
Enter the network mask for the Unistim IP network:
```

Simply enter the network mask of the Unistim VLAN. Finally, it prompts:

```
Enter the default route for the Unistim IP network
```

```
(Enter 0.0.0.0 for no route):
```

As prompted, enter the default route or “0.0.0.0” for none.

### 1.8.2 H.248 VLAN

In SN07, the H.248 VLAN preboot step required the operator to provide a pair of static address in addition to the H.248 floating address (totalling 3 H.248 VLAN addresses).

For consistency with the Unistim VLAN, provide the pair of static addresses. As a result, the H.248 VLAN preboot step prompts with a near identical set of questions as for the Unistim VLAN step.

Finally, it is worth pointing out that should it become necessary to carry out a network reconfiguration, the H.248 and Unistim VLAN preboot steps can be manually re-executed by issuing the following command through a CICM terminal window:

```
preboot h248 /interactive
```

or

```
preboot unistim /interactive
```

All information is prompted for once again upon issuing these commands, thus allowing the operator to change any aspect of the configuration. However, executing these commands can only be done safely when neither node is in service thus making an outage unavoidable.

### 1.8.3 System Upgrade from 7.20 to 8.10

The only supported upgrade path to 8.10 is from 7.20. this system upgrade effectively reduces the number of needed Unistim IP address from 2 down to the operator has 2 choices in selecting the floating Unistim IP address. S/he may:

- Continue using node A's existing Unistim address, or
- Continue using node B's existing Unistim address

**Warning: As always, it is strongly recommended that upgrades be performed when call processing activity on the CICM is low.**

The following steps assume that the operator wishes to maintain node A's existing Unistim address as the floating address following the upgrade. Obviously, the steps can be adjusted to maintain B's Unistim address.

The upgrade consists of the following steps:

- 1 From the Element Manager's maintenance page, use the terminal transfer tool to transfer all terminals to node B and SWACT if necessary to make that node the master.
- 2 Take node A out of service and carry out the normal re-installation procedure appropriate to the platform in question using the 8.10 installation image.
- 3 When running preboot and prompted to enter the floating IP address, the operator specifies node A's old static Unistim address.

**Warning:** When performing step3 , the operator must **NOT** specify anything other than A's old Unistim static address including B's current Unistim address. As it is still in use at this stage of the upgrade, an address conflict would occur. Such a conflict could have undesirable effects on the terminals currently making use of this address. The software cannot enforce using A's old static Unistim address!!

**Warning:** In fact, it is important to note that care must be taken to enter the same information at each of the preboot stages as was originally done on installation of the node. Any discrepancies in any of the IP information could lead to problems with the upgrade. The software does not safeguard against this.

- 4 When node A returns to service, it will come up as the slave under the new architecture. The VMG component performs a bulk synchronisation of its data. The Terminals component will not synchronise with its mate in this special hybrid situation.
- 5 Once the maintenance page indicates that the system is ready, initiate a SWACT and make node A the master. As per the new Active Call Failover behaviour, the Terminals component on node A binds the floating Unistim IP address (i.e. its old static address). However, unlike the expected ACF behaviour, node B does not release its static Unistim address nor does node A perform any recovery actions. Instead, the 8.10 node mimics the 7.20 behaviour and the Terminals component allows terminals to connect to either node.
- 6 From the Element Manager's maintenance page, initiate a terminal transfer<sup>1</sup> from node B to node A. As the 8.10 node mimics the 7.20 behaviour, the transfer causes sessions on node B to be destroyed and a replacement session created on node A once the terminal connects. Other than redirecting the terminal to a different IP address, no explicit transfer of session data occurs.

**Warning:** After performing step 6, should the operator need to revert back to B as the master node, it is import to remember that the terminals must be transferred back to B manually. Initiating a SWACT at this point cause A to release its floating Unistim address as per the 8.10 behaviour. Naturally, all terminals connected to this node would be lost. For this reason, it is critical that a manual terminal transfer be performed **BEFORE** the SWACT is initiated. The software does not safeguard against this case!!

---

1. At this stage, it must be noted that terminal transfer functionality is made available in this special hybrid situation (one node at 7.20 while the other is at 8.10). However, once the upgrade is complete and both nodes are running 8.10, the tool is hidden from the operator. For 8.10 and later loads, the functionality is not made available as it becomes the context of Active Call Failover.

- 7 Once the terminal transfer to A is complete, take node B out of service and carry out the re-installation procedure.
- 8 When node B returns to service under the 8.10 software load, it initiates a bulk synchronisation of all components and operates fully as slave in the new redundancy architecture.

### **1.9.4 Maintenance and Monitoring Interface**

The operator aspects of system redundancy can be accessed from the status and maintenance pages of the Element Manager. Active Call Failover introduces a number of new fields and changes others. As a result, an overall review and consolidation exercise has been carried out on these pages in order to present a more consistent look and feel. The changed fields or those that are of particular relevance to redundancy are discussed next.

#### **1.9.4.1 System Status**

This page changes only slightly in 8.10. As shown in Figure 4, although previously present, the “virtual media gateway” summary table changes only in how the existing information is presented. The “terminals” table entry changes in function and now reflects the new failover ability of this component.

Centrex IP Client Manager - Microsoft Internet Explorer provided by Nortel Networks

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://element\_manager/centrexip/ Go

## Centrex IP Client Manager

**cicm-180 cicm status**

**CICM-180 - Status - System in Service - No Alarm** Refresh 18:21:55 (30 seconds)

| Slot   | CICM-180-A | CICM-180-B |
|--------|------------|------------|
| Fault  |            |            |
| Active |            |            |
| Maint  |            |            |

**Node A, 47.165.168.180** Service = **running**  
Node State = slave  
Fault code = 0 :  
- No faults detected

**Node B, 47.165.168.185** Service = **running**  
Node State = master  
Fault code = 0 :  
- No faults detected

**virtual media gateway** ?

|            |                   |
|------------|-------------------|
| State      | <b>in service</b> |
| Active on  | node A            |
| Peer state | <b>in sync</b>    |

**terminals** ?

|            |                |
|------------|----------------|
| Active on  | node A         |
| Peer state | <b>in sync</b> |

**network** ?

| IP address    | Adapter                                                                        | Physical Port | Active     |
|---------------|--------------------------------------------------------------------------------|---------------|------------|
| 192.168.52.33 | Intel 8255x-based PCI Ethernet Adapter (10/100) - Packet Scheduler Miniport    |               | <b>Yes</b> |
| 192.168.52.37 | Intel(R) Advanced Network Services Virtual Adapter - Packet Scheduler Miniport |               | <b>Yes</b> |
| 192.168.52.38 | Intel 8255x-based PCI Ethernet Adapter (10/100) - Packet Scheduler Miniport    |               | <b>Yes</b> |
| 192.168.52.34 | Intel(R) Advanced Network Services Virtual Adapter - Packet Scheduler Miniport |               | <b>Yes</b> |

**summary**

**perform maintenance on cicm-180**

**view status of chassis components**

**view node alarms**  
Node

**performance monitoring**

**view the status of**

CICM-EM 7.0 .administrator

[cicms](#) [home](#)

Done Internet

Figure 4 Element Manager Status Page



Both of the component tables present two identical field in common. The “Active on” field indicates on which node the active component is running (as in Figure 2). The field may display one of three values:

- node A
- node B
- unavailable

The significance of the first 2 values is obvious. A value of “unavailable” typically indicates that neither node is running. In fact, the “unavailable” state applies to all table fields discussed next when neither node is running. However, when this is so, this fact also appears in the more prominent overall summary at the top of the status page.

The “Peer state” field shows if the inactive component on the mate is in synchronisation with the active component. It may have one of 3 values:

- in sync
- out of sync
- unavailable

A state of “in sync” obviously indicates that it is running and in a state of synchronisation with the active unit. A state of “out of sync” may indicate that the mate component has not yet (normal on start-up) or not correctly reached a state of synchronisation with the active unit. If the component is not running (e.g. the node may be down; which would appear in the summary section at the top of the page), the “out of sync” state is also displayed.

The “virtual media gateway” table also maintains a third field labelled “State”. This field serves to show the state of the VMG as controlled at the CS2K. It may assume one of the following values:

- in service
- out of service
- unavailable

A state of “in service” indicates that communication with the GWC is established and that the CICM has been instructed as such.

A state of “out of service” (despite having a node running as master) can be due to the VMG having been manually taken out of service at the CS2K. Otherwise, the VMG typically fails to go into service when communication with the GWC simply cannot be established. This in turn may be due to a general network problem or could also be due to a failed critical adapter (if a node is running stand-alone) or a failure of both critical adapters (if both nodes



are running). However, adapter failures show up in the “network” table on the same page. The connections and terminals performance monitoring pages that are available from the status page are modified to provide a consistent data set. However, these pages are not shown.

### 1.9.5 Maintenance Status

The 8.10 maintenance status page is updated in line with the system status page and is shown in Figure 5.

The screenshot displays the Centrex IP Client Manager web interface in Microsoft Internet Explorer. The browser address bar shows `http://element_manager/centrexip/`. The page title is "Centrex IP Client Manager". The left sidebar contains a navigation menu with categories: CICM (status, configuration, terminals, users, maintenance), CICM-EM 8.0 (status, synchronization, maintenance), profiles (audio, enterprise, language, network, user, feature), and diagnostics. The main content area is titled "maintenance status (cicm-180)". It displays two tables of data for Node A (47.165.168.180) and Node B (47.165.168.180). To the right of the tables are several action buttons and controls, including "apply maintenance release", "restart terminal service on node A", "node A service control", "node B service control", "switch activity", "reset counter", "start auto refresh", "refresh now", and "system status".

| Node A (47.165.168.180)  |                                         |
|--------------------------|-----------------------------------------|
| Status                   | master                                  |
| Application              | running                                 |
| Maintenance status       | system idle (current reboot count: 0)   |
| Version                  | CICM 8.10 Base Release (Build 8.10.xxx) |
| VMG status               | active (in service)                     |
| Active half calls        | 5 (total calls=342)                     |
| Terminals status         | active                                  |
| Logged in users          | 43 (total logins=262)                   |
| Active terminals         | 54                                      |
| Terminal recovery status | n/a                                     |

| Node B (47.165.168.180)  |                                         |
|--------------------------|-----------------------------------------|
| Status                   | slave                                   |
| Application              | running                                 |
| Maintenance status       | system idle (current reboot count: 0)   |
| Version                  | CICM 8.10 Base Release (Build 8.10.xxx) |
| VMG status               | inactive (in sync)                      |
| Active half calls        | n/a                                     |
| Terminals status         | inactive (in sync)                      |
| Logged in users          | n/a                                     |
| Active terminals         | n/a                                     |
| Terminal recovery status | n/a                                     |

At the bottom left of the page, it says "CICM-EM 7.0 administrator". At the bottom right, there is a "maintenance home" link.

**Figure 5 Element Manager Maintenance Page**

In the central area of the page, each node provides a table showing maintenance information about the node. The "Status" field (previously named "Node status") indicates the platform level state of the node in question and assumes one of the following values:

- idle
- master
- slave
- swacting master?slave
- swacting slave?master
- master (no slave)

The new "VMG status" field shows the current state of the virtual media gateway component on the node in question. It effectively combines into a single field the information contained in the "State", "Active on" and "Peer state" fields of the "virtual media gateway" table from the system status page. It may assume one of the following values:

- active (in service)
- active (out of service)
- inactive (in sync)
- inactive (out of sync)
- swacting master->slave
- swacting slave->master

Related to the VMG and just beneath it is the "Active half calls" field. When the node's VMG is active and in service, this field provides the number of currently active half calls (with the total historical number in brackets). When the VMG is inactive, this field is greyed out and displays a value of "n/a" indicating "not applicable".

Similarly, the "Terminals status" field shows the overall state of this component and combines the information of the "Active on" and "Peer state" fields of the "terminals" table from the system status page. It assumes one of the following values:

- active
- inactive (in sync)
- inactive (out of sync)

- swacting master->slave
- swacting slave->master

Related to the Terminals component and just beneath this field appear 2 additional fields:

- Active terminals
- Logged in users

Similarly, when the Terminals component on the node is active, these 2 fields are enabled and display the information as suggested by their names. When the component is inactive on the node, the fields appear greyed out and display a value of “n/a”.

A third field applicable to the Terminals component serves a purpose only during a switch of activity of the component. Accordingly, it is named “Terminals recovered”. Under normal operation (i.e. no terminals are in the process of being recovered), it shows “n/a” for “not applicable”. During a switch of activity, the newly promoted active unit shows the progression of the recovered terminals as a percentage of the total active terminals.

In the actions section of the maintenance page, the "switch activity" link is only displayed when the functionality is actually available. However, once clicked, a number of automated tests are performed before the system proceeds. The operator may be provided with a number of warnings regarding the consequence(s) of proceeding (if any).

*Warning: Once a SWACT is initiated, it CANNOT be manually aborted. The operator must allow for the switch of activity to complete before any further maintenance can be attempted (e.g. performing a second SWACT, applying MRs, etc.).*

Following a switch of activity, the roles of both nodes should be exchanged. Initiating this switch of activity manually would generally be desirable for maintenance purposes just prior to taking a node out of service (to swap a faulty CPU blade for instance).

The "node N service control" (where N is either “A” or “B”) box appears for each available node and offers 3 context sensitive options:

- Restart: Stop all services on this node and reinitialise the CPU card. Services restart automatically following the nodal restart and processing should also be resumed.
- Stop: Stops the CICM service from running thus halting processing on the node in question. However, the CPU card remains active.

- **Start:** Starts a stopped CICM service and resumes processing on the node in question.

In 7.20, the terminal transfer functionality offered a simple mechanism to automate the migration of terminals from one node to the other. This was useful when performing maintenance activities as both nodes actively hosted terminals.

The screenshot shows the Centrex IP Client Manager web interface in a Microsoft Internet Explorer browser window. The address bar shows `http://element_manager/centrexip/`. The page title is "Centrex IP Client Manager". On the left is a navigation menu with categories like CICM, status, configuration, terminals, users, maintenance, and diagnostics. The main content area is titled "maintenance status (cicm-180)". It displays two tables of data for Node A and Node B.

| Node A (47.165.168.180)  |                                         |
|--------------------------|-----------------------------------------|
| Status                   | master                                  |
| Application              | running                                 |
| Maintenance status       | system idle (current reboot count: 0)   |
| Version                  | CICM 7.10 Base Release (Build 7.10.xxx) |
| VMG status               | active (in service)                     |
| Active half calls        | 5 (total calls=342)                     |
| Terminals status         | active                                  |
| Logged in users          | 43 (total logins=262)                   |
| Active terminals         | 54                                      |
| Terminal recovery status | n/a                                     |

| Node B (47.165.168.180)  |                                         |
|--------------------------|-----------------------------------------|
| Status                   | slave                                   |
| Application              | running                                 |
| Maintenance status       | system idle (current reboot count: 0)   |
| Version                  | CICM 8.10 Base Release (Build 8.10.xxx) |
| VMG status               | inactive (in sync)                      |
| Active half calls        | n/a                                     |
| Terminals status         | inactive (in sync)                      |
| Logged in users          | n/a                                     |
| Active terminals         | n/a                                     |
| Terminal recovery status | n/a                                     |

On the right side of the page, there are several action buttons and controls:

- apply maintenance release:** Includes a dropdown for "Node" (set to "Node A (47.165.168.180)") and a "Maintenance Release" dropdown (set to "No files found"). A note states: "Note: Maintenance releases should be securely transferred to 'D:\Centrex\IPsupport\firmware\gateway\_MRs' on the master Element Manager Node".
- transfer terminals:** Includes a dropdown for "Node" (set to "From node A to node B") and a "Terminal Shutdown Timeout" dropdown (set to "10 mins").
- node A service control:** Includes an "Action" dropdown (set to "Stop").
- node B service control:** Includes an "Action" dropdown (set to "Stop").
- switch activity:** A button.
- reset counter:** Includes a dropdown for "Node" (set to "Node A") and a "Reset Counter" dropdown (set to "Current Reboot Count").
- start auto refresh:** A button.
- refresh now:** A button.
- system status:** A button.

At the bottom left, it says "CICM-EM 7.0 administrator". At the bottom right, there is a "maintenance home" link. The browser status bar at the bottom shows "Done" and "Internet".

Figure 6 Maintenance page during an upgrade

In 8.10, the terminal transfer functionality becomes redundant as there is no longer any such concept. All terminals are always hosted by the master node. As a result, the functionality is no longer offered on the maintenance page when the Element Manager is inspecting an 8.10 (or later) CICM. The functionality continues to be offered when inspecting a pre-8.10 CICM.

However, there is one exception to the above statement. As previously mentioned, the functionality remains available in the special case when the Element Manager detects that only one of the nodes is running 8.10. The terminal transfer functionality is thus available (and needed) during the actual upgrade process as shown in Figure 6.

The "system status" link box on this page offers the operator a quick and easy method of navigating to the corresponding node's status page. This may often be useful after some maintenance activity has been carried out on the CICM.

### 1.9.6 Procedure: Taking a node out of service

The following provides the proper procedure to follow to take one of the CICM nodes out of service. This procedure aims to provide the operator with the best method of removing a node from the CICM chassis with the least possible impact on service.

***Warning:** Although this procedure aims to minimise the impact on service, it does not eliminate it. It is strongly recommended that such maintenance procedures only be executed during low activity periods.*

#### 1.9.6.1 Step 1: Perform a SWACT

If the node that is to be taken out of service is currently the master, a switch of activity should be executed. This can be initiated from the Element Manager's maintenance page using the "" link. Upon clicking the link, the operator is presented with a warning message and asked to confirm the action.

Once the SWACT is initiated, the operator must wait for the switch of activity to complete. As the Terminals component must recover all terminals, the SWACT takes a while to complete. Transient states are displayed during the switch and the operator should not proceed to the next step until the switch of activity has fully completed.

A SWACT is complete only once the "Status" field of each node on the maintenance page shows "master" on the node to be kept in service and "slave" on the node that is intended to be taken out of service for the maintenance.

#### 1.9.6.2 Step 2: Stopping the slave node

Once the switch of activity (if needed) is completed, a stop of the slave node can be initiated. No further special actions are needed as the node should no

longer be supporting traffic at this point. The "node N service control" function on the maintenance page can be used to stop the slave node.

### **1.9.6.3 Step 3: Perform desired maintenance**

Once the node has stopped, it is safe to proceed with removing the CPU blade, etc.

## **1.10 Event Monitoring**

### **1.10.1 Logs**

As introduced in SN07, the IEMS logging system continues to be used as high level log unification platform. The CICM reports its most significant logs to it.

Although the Active Call Failover activity introduces no new logs destined for the IEMS, a number of logs pertaining to platform (or node) level redundancy were introduced as part of the activity addressed by [3]. Please refer to that document for further details.

The CICM's own local logging system continues to operate in parallel and is used to capture additional and more detailed information about local events.

These local system logs continue to be generated following existing practices. The three existing severity levels of logs are:

- 1** Error: serious and often unrecoverable events
- 2** Warning: unexpected, but recoverable events
- 3** Information: expected but significant events

As has been suggested throughout this document, it makes sense to differentiate between a node's status and the state of the individual components running on that node.

The concept of a node's status (master vs. slave) was introduced in SN06.2 with the Dual Node Redundancy functionality. At the time, a number of logs were introduced to mark significant platform level events from a redundancy perspective.

The Active Call Failover activity does not introduce any new platform level redundancy logs. As such, please refer reference [1] to review these logs.

This activity does however introduce a number of local logs to clearly identify significant events that occur to the individual components of the system.



Information logs are generated by both the VMG and Terminals components for the following normal start-up events:

- On master: Component initialises as
- On slave: Component initialises as
- On master: Slave component requests a bulk sync
- On slave: Bulk sync of data completes; Ready for SWACT

A number of information logs are generated by each component as it performs an operator-initiated switch of activity:

- On master: Component receives notification to SWACT
- On slave: Component receives request from its counterpart to assume the role of the master
- On slave: Component completes transition to active
- On master: Component receives acknowledgement from mate that it is now active; completes transition to active.

### 1.10.2 SNMP

This feature introduces no new SNMP nodes or traps. Therefore, the original behaviour of the Dual Node Redundancy feature (see reference [1]) combined with the changes made in SN07 (see reference [3]) remain valid.

However, for a CICM installation that does not make use of the IEMS to monitor SNMP, a subtle clarification is of value. Some slight changes have been introduced to the Element Manager's status page with this feature. The "virtual media gateways" section of the page no longer displays its states as:

- In Service
- Out of Service
- Hot Standby
- Stopped

Instead, it now splits the active vs. inactive state of the component from the overall VMG state to make things clearer and more explicit. On the maintenance page, the "VMG status" combines this information into a summary and now reports either:

- active (in service)
- active (out of service)
- inactive (in sync)

- inactive (out of sync)
- swacting master?slave
- swacting slave?master
- stopped

As originally implemented in SN06.2 and described in [1], the *cicmVLCMUnit0State* and *cicmVLCMUnit1State* nodes are located in the MIB hierarchy under:

**...|cicm|cicmVLCM|cicmVLCMTable|cicmVLCMTableEntry**

and are used to reflect the status of the VMG. These SNMP nodes may have one of the following states:

- inService(0): VMG is in service as the active component
- stopped(1): VMG is not running
- outOfService(2): VMG is not in service
- hotStandby(3): VMG is in service as the inactive component

For backwards compatibility reasons and given that the non-IEMS SNMP system is likely to be phased out over time, instead of changing the SNMP nodes as such, a simple mapping to the new status names is offered in the following table.

**Table1 : VMG Status to SNMP Mapping**

|               | <b>VMG status as displayed<br/>on EM status page</b> | <b>SNMP status reported</b> |
|---------------|------------------------------------------------------|-----------------------------|
| <b>master</b> | <del>active</del> -(in service)                      | inService(0)                |
|               | <del>active</del> -(out of service)                  | outOfService(2)             |
|               | stopped                                              | stopped(1)                  |
| <b>Slave</b>  | (in sync)                                            | hotStandby(3)               |
|               | (out of sync)                                        | outOfService(2)             |
|               | Stopped                                              | stopped(1)                  |

### 1.10.3 Alarms

This feature introduces no changes to the alarm system. As a result, the original behaviour introduced with the Dual Node Redundancy feature discussed in [1] and subsequent changes made in SN07 as described in [3] remain valid.



## 1.11 System Engineering

Table 2 summarises the durations of the maintenance activities of particular interest. Additional information follows.

**Table 2: Timing of significant maintenance activities**

|                                                         | Call Processing Load |               |
|---------------------------------------------------------|----------------------|---------------|
|                                                         | Average - High       | Low           |
| Master node<br>Start-up delay                           | N/A                  | < 100 seconds |
| Slave node<br>Start-up delay                            | > 12 minutes         | 4-6 minutes   |
| VMG switch of activity                                  | < 3 seconds          | < 1 second    |
| VMG “at risk” period                                    | < 10 seconds         | < 2 second    |
| Terminals switch of<br>activity                         | 140 seconds          | 70 seconds    |
| Period required to<br>recover an individual<br>terminal | < 2 seconds          | < 1 second    |
| Overall platform switch<br>of activity                  | 150 seconds          | 75 seconds    |

The *master node start-up delay* is measured from the time the node is first physically powered up (or hard reset) to when it sends its first H.248 message to the gateway controller advertising it is ready for service. From this point, it is up to the gateway controller to acknowledge the message and bring individual lines into service. In order to have a complete view of the total start-up time from power up to dial tone, the reader may wish to consult the gateway controller’s engineering guide.

A number of factors influence the total duration required by the slave node to initialise and prepare itself to accept a SWACT request. However, all but a single factor are relative constants to the overall total. The bulk synchronisation mechanisms of the various components discussed earlier are the only variable factors. As call processing must be given a higher priority over this bulk synchronisation, the start-up period increases with increased activity.

Given this prioritisation in an average to high call processing load scenario, the bulk synchronisation could take longer such that even the stated value cannot be guaranteed.

A switch of activity of the VMG component from start to finish lasts no more than 3 seconds, but typically lasts less than a second. The “at risk” period is the time during which unstable calls are in danger of being lost. This period begins when the SWACT is initiated and should last no more 10 seconds even with a high call processing load.

A switch of activity of the Terminals component lasts much longer due to the need to actively recover each individual terminal connected to the CICM at the time. This period is measured as the time that component starts the SWACT process until the time the last terminal has been recovered.

It is also of value to measure the period necessary to recover a single individual terminal. These values are of interest as they directly impact the end-user perception of the responsiveness of the terminal over a recovery. As such, the values provided are only applicable when the user interacts with the terminal sometime after a SWACT has been initiated but before it has been recovered.

The period is measured from the time the first Unistim event is received at the CICM to when it can actually be processed normally. The values stated are therefore in addition to any normal delay (e.g. network congestion, GWC load and therefore delay in processing the event, etc.).

The overall platform switch of activity reflects the sum of individual component SWACTs plus a small correction factor.

## 1.12 Limitations and Restrictions

This section aims to summarise the limitations and restrictions of the Active Call Failover functionality. Many points will have already been discussed in previous sections.

- 1 During the switch of activity of the VMG component, only stable calls are guaranteed to survive. Unstable calls may or may not survive. For the definition of stable versus unstable calls, please refer back to the end of section .
- 2 Performing a stop or restart of a node from the element manager will not automatically initiate a SWACT even if one may be desirable. It is the operator's responsibility to ensure the node is in the desired state before performing the stop. The element manager will however provide warnings of proceeding with any potentially service affecting actions.
- 3 Once initiated, a SWACT cannot be cancelled despite its possibly long duration. To return the system to its original pre-SWACT state, a second SWACT must be carried out once the first one completes.
- 4 The only supported upgrade path to 8.10 is from 7.20 for both the CICM and EM. The 8.10 Element Manager may be used to manage 2.5, SN06.2, SN07 and SN08 CICMs.

- 5 With 8.10, the CICM ceases to support a load-sharing mode. This feature's goal is to shift the role of the secondary node from providing a load-sharing capability to providing full failover redundancy.
- 6 Because of the amount of processing work involved in the terminal recovery process, some real-time impact on call processing may arise during a SWACT.
- 7 The terminal recovery process on a SWACT may be long.
- 8 The terminal recovery process does not prioritise terminals in active calls over idle terminals. The recovery process aims to recover all terminals sequentially and without prejudice. However, the recovery process does give immediate priority to a terminal that experiences user interaction.
- 9 During a SWACT, incoming events (state change requests) from the GWC will NOT be immediately presented to a non recovered terminal. Only at the point that the terminal is recovered is it presented the updates.
- 10 In the rare case that the new master node should experience an outage while a switch of activity is in progress, it cannot be guaranteed that some terminals won't reboot and that calls won't be lost as a result.

### 1.13 Feature impacts and Interactions

Active Call Failover impacts some existing functionality of the CICM and results in a few changes to the overall system:

- 1 The terminal transfer functionality is no longer relevant on an 8.10 CICM as the system now manages terminal recovery (or hand-over) automatically on a switch of activity. The option is therefore not available when managing an 8.10 CICM (or later) with the Element Manager.
- 2 Prior to ACF, each terminal typically would have its S1 IP address pointed to one node of the CICM with S2 directed to the other node as a back-up. Given that the south-side of the CICM now only provides a single IP address to which clients can connect, the S2 IP entry has been made redundant from the CICM's perspective. The entry is now free to be used for other purposes such as directing it to a local SRG for a local back-up system. As always, S1 and S2 can be configured manually or via DHCP. The configuration details of the terminals falls outside the scope of this document.

### 1.14 References

- [1] [H.248 Dual Node Redundancy - FN](#) (A00002715, SN06.2); Paul Richard

- [2] CICM 7.1 Initial Installation and Commissioning (24-0479, S N07); Jeff Cole
- [3] [Alarms Logs and Performance - FN](#) (A00003718, SN07); Martyn Hollins; Karen Davies

## ***Product = Centrex IP Client Manager (CICM)***

### **A00004981--VCAC Provisioning Support for CICM Gateways** ***Functional Description***

#### **1.1 Applicable Solution(s)**

IAW, IAC

*Note:* This is an SN07 feature, included here by special request.

#### **1.2 Description**

Activity A00002512 introduces VCAC in the SN07 timeframe. VCAC introduces Limited Bandwidth Links (LBLs) to the SESM (network panel) AND a topological hierarchy that links LBLs and NATs to form a tree of 'internet transparency middleboxes'. These devices are sent to the small lines GWCs via the

GWC-MIDDLE-BOX-MIB and  
GWC-MIDDLEBOX-RSRCUSAGE-MIB (the resource usage of the LBL)

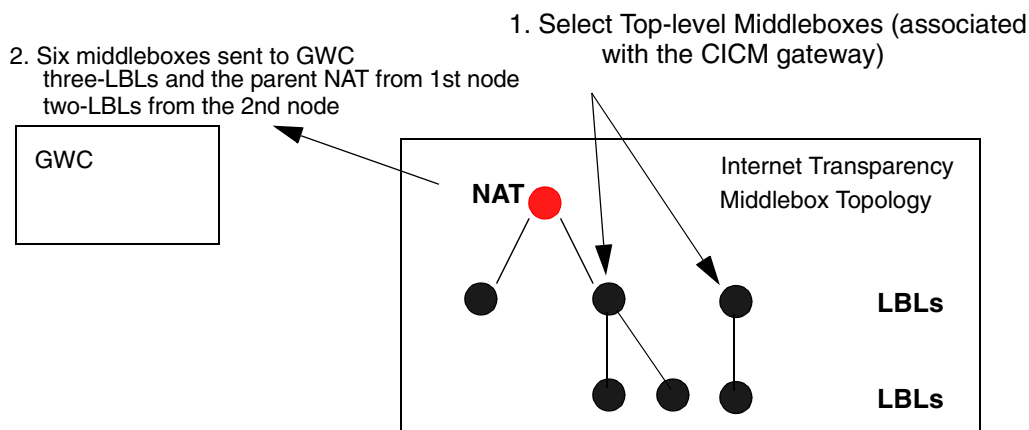
The model for this download of data has been designed for the "fixed-lines" IAD deployment, and occurs when the gateway is associated to an adjacent-middlebox.

This solution is to allow VCAC to function correctly for CICM gateways because unlike the small-lines IAD solution the CICM gateways resides in the TSP (succession) domain. The CICM **gateway** does not "fit" the concept of an "adjacent middlebox". The Adjacent middlebox will always be = 0 ( <none> ).

CICM users login to the CICM terminals, this sends a message to the GWC. In SN07 this message will contain the "discovered" adjacent middlebox of the terminal/endpoint. The CallP ITA function will then "look-up" this middlebox in the GWC static tables. For a more comprehensive problem definition please refer to the DID for this activity.

This solution allows the user to provision a set of root (top-level) middleboxes, allowing the GWCEM to send all the underlying middleboxes to the GWC. Ensuring that when a CICM user logs in, the middlebox will be available on the GWC, see figure 1.

**Figure 1 CICM gateway : Multiple root middlebox provisioning**



This feature provides the following functionality (from the OSS and GWCEM - GUI):

- Provision a set of root middleboxes (a maximum of 5) per CICM gateway.
- Change the current provisioning of root middleboxes against provisioned CICM gateways.
- Display/Query the root middleboxes that are provisioned against a CICM gateway.

### 1.3 Hardware Requirements or Dependencies

No new hardware is required or introduced by this feature. The application components provided by this feature execute as part of the SESM.

### 1.4 Software Requirements or Dependencies

Dependencies:

- A00002512 VCAC provisioning for the GWCEM
- A00003568 E911 support will allow the CICM endpoints adjacent middlebox to be sent to the GWC when the user logs into the gateway.
- A00002739 GWC Call-P for the VCAC functionality.

## 1.5 Limitations and restrictions

- The GWC has a limit of 2000 middleboxes.
- Internal counting limits the provisioning of gateways onto the same GWC as the associated chain of LBLs (they must be provisioned onto one GWC). This needs to be made clear in the engineering guidelines, and will be blocked by code to stop the user from completing such provisioning steps.
- A limit of 5 Root Middleboxes can be provisioned against a gateway.
- The CentrexIP users cannot roam outside of their provisioned “enterprise” area, and expect VCAC to function.

## 1.6 Interactions

The following existing GUIs have been modified:

- Associate Media Gateway Dialog (see Figure 3).
- Change Gateway Dialog (see Figure 4).
- Gateway Provisioning Panel (see Figure 2)

The following existing XML commands have been modified:

- AssocMG (see Figure 6)
- ChangeRootMiddleBoxes (see Figure 9).
- QueryMG (see Figure 7 and Figure 8).

The on-line help facility will be updated with information on the use, syntax and valid values for all the above modifications/additions.

## 1.7 Applicable customer facing sections

### Fault Management

Logs \_N/A\_

Alarms \_N/A\_

### Configuration

Data Schema \_X\_

User Interface \_X\_

Element Management \_N/A\_

Security \_N/A\_

Service Order \_N/A\_

Office Parameters \_N/A\_

Accounting (includes AMA billing) \_N/A\_

Performance (includes operational measurements) \_N/A\_

## 1.8 GWC-EM GWC Provisioning

The GWC-EM has been modified to display the rootMiddleboxes that are provisioned against the CICM gateways.

### 1.8.1 GUI Client : The Gateways panel

Figure 2 The GWC-EM Gateways Panel

Maintenance Provisioning

Controller Gateways Lines Carriers Media Proxies QoS Collectors

Retrieval criteria:  Retrieve

Limit results: 25   Retrieve All

Gateway List

| Name | IP Address | Profile | Max Terms | Res Terms | Protocol | Prot Vers | Prot Port | PEP Server | Adj IT |
|------|------------|---------|-----------|-----------|----------|-----------|-----------|------------|--------|
|------|------------|---------|-----------|-----------|----------|-----------|-----------|------------|--------|

Number of results: 0

## 1.9 Gateway Provisioning changes

The association of a CICM gateway(or other future Roaming user style gateways) to a GWC has been modified to allow the user to provision a set of

root middleboxes (0..5 only). Already provisioned gateways can also be changed to have a different set of (or none) root middleboxes.

## 1.9.1 GUI Client

### 1.9.1.1 Associate gateway GUI

The Associate gateway dialogue has been modified to display a new internet transparency panel, this occurs when a CICM gateway has been selected. The user may optionally select upto 5 root middleboxes to associate with the CICM gateway, these are selected to define the roaming area where VCAC will function for the CICM users/endpoints. The root middlebox selection process is controlled from within the Root middlebox selection area, this is the same for either the Associate gateway or the Change gateway commands.

**Figure 3 Associate gateway dialogue**

**Associate Media Gateway**

Gateway name:

Gateway IP address:

Gateway controller name: GWC-115

Gateway profile name: CICM

Reserved terminations:

Gateway site name: LG

**Root Middlebox Selection**

Middlebox Name: nat1

Middleboxes: lbi2, lbi22, lbi222, lbi22b, lbi4, lbi5, mflBL1, nat1

Root Middleboxes: lbi1

Add >> << Rem

**Signal Protocol**

Protocol type: MEGACO (4)

Protocol port: 2944

Protocol version: 1.0

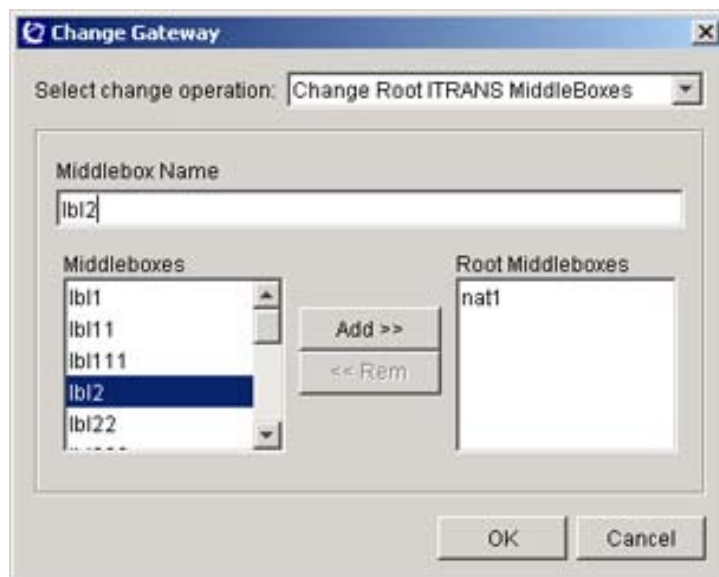
OK Cancel



### 1.9.1.2 Change Gateway GUI

The change gateway Root Middleboxes dialogue has been created to allow the user to modify (or remove) the Root Middleboxes associated with an already provisioned CICM gateway.

**Figure 4** Change gateway RootMiddleboxes dialogue



### 1.9.1.3 Root Middleboxes Details

**Figure 5** Root Middlebox details can be displayed by selecting the details button.



### 1.9.2 XML Interface

The AssocMG and QueryMG interface has been modified to allow/display (0..5) root middleboxes. A new interface ChangeRootMiddleboxes has been added to the ItransIf code. If any request is unsuccessful, an error message is returned as described in Appendix B.

### 1.9.2.1 AssocMG command

**Figure 6 XML command AssocMG**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <assocMG usn="1" version="1.0">
        <Parameters>
          <mgUIName>MGBOBXML.5</mgUIName>
          <mgProfileName>CICM</mgProfileName>
          <mgIpAddr>22.33.44.56</mgIpAddr>
          <mgProtocolType>4</mgProtocolType>
          <mgProtocolVersion>1.0</mgProtocolVersion>
          <mgProtocolPort>2944</mgProtocolPort>
          <gwcUIName>GWC-113</gwcUIName>
          <reservedTerminations>5</reservedTerminations>
          <rootMiddleboxName1>NAT1</rootMiddleboxName1>
          <rootMiddleboxName2>NAT2</rootMiddleboxName2>
          <rootMiddleboxName3>NAT3</rootMiddleboxName3>
          <rootMiddleboxName4>NAT4</rootMiddleboxName4>
          <rootMiddleboxName5>NAT5</rootMiddleboxName5>
        </Parameters>
      </assocMG>
    </Methods>
  </Command>
</CommandList>
```

### 1.9.2.2 QueryMG command

**Figure 7 XML command for queryMG (No change)**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <queryMG usn="1" version="1.0">
        <Parameters>
          <mgUIName>MGBOBXML.5</mgUIName>
        </Parameters>
      </queryMG>
    </Methods>
  </Command>
</CommandList>
```

**Figure 8 XML response for queryMG**

```
<?xml version="1.0" encoding="UTF-8"?>
<CommandList>
<Response>
<Interface>cs2kCfgMgrIf</Interface>
<Methods><queryMG usn="1" version="1.0">
<ReturnData>
<Row>
    <mgUIList>bobcicm.1</mgUIList>
    <mgIpList>43.43.22.11</mgIpList>
    <callServerId>CS2K1_MAID</callServerId>
    <gwcUIName>GWC-113</gwcUIName>
    <svcTypeList>0</svcTypeList>
    <nodeName>LG    033</nodeName>
    <engrEndPoints>123</engrEndPoints>
    <protType>megaco</protType>
    <protVersion>1.0</protVersion>
    <protPort>2944</protPort>
    <profileName>CICM</profileName>
    <rootMiddleboxName1>NAT1</rootMiddleboxName1>
    <rootMiddleboxName2>NAT2</rootMiddleboxName2>
    <rootMiddleboxName3>NAT3</rootMiddleboxName3>
    <rootMiddleboxName4>NAT4</rootMiddleboxName4>
    <rootMiddleboxName5>NAT5</rootMiddleboxName5>
  </Row><RC>0</RC><MsgTxt>Query of a Single MG
was successful</MsgTxt>
</ReturnData>
</queryMG>
</Methods>
</Response>
</CommandList>
```

### 1.9.2.3 ChangeRootMiddleboxes command

**Figure 9 XML command for ChangeRootmiddleboxes**

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>ITransIf</Interface>
    <Methods>
      <changeRootMiddleboxes usn="1" version="1.0">
        <Parameters>
          <MGname>bobcicm.1</MGname>
          <rootMiddleboxName1>NAT1</rootMiddleboxName1>
          <rootMiddleboxName2>NAT2</rootMiddleboxName2>
        </Parameters>
      </changeRootMiddleboxes>
    </Methods>
  </Command>
</CommandList>
```

## 1.10 Authorization for Commands

The security for the GUI Client and OSSgate interface includes support for permission or 'Authorization' levels for commands. Each command is associated with one or more user groups. In order to execute a command, a user must belong to at least one of the associated user groups. The user groups associated with the new commands associated with this feature are specified in the table below.

**Table 1 NEW Internet Transparency Commands Authorization**

| Command                                | User Group |       |        |          |       |
|----------------------------------------|------------|-------|--------|----------|-------|
|                                        | mgcadm     | mgcrw | mgcmte | mgcsprov | mgcro |
| ChangeRootMiddleboxes                  | X          | X     |        |          |       |
| Display Gateway Root Middlebox details | X          | X     | X      | X        | X     |

## 1.11 Upgrade

When upgrading the GWCEM to SN07 when CICM gateways are present in the Network:

It is necessary to (i) set the Call Agent ID and then (ii) update the IDs for all enterprises (NATs) on a CICM to new IDs **prior** to upgrading the CICM Gateway.

Hence the recommended order for upgrade is as described below:

### Upgrade Procedure

1. Upgrade GWCEM to SN07.
2. Set Call Agent ID in GWCEM. This causes all existing middlebox ids to be upgraded to the SN07 format.
3. Upgrade the GWC to SN07 (this may also be done after step 5).
4. Upgrade CICM EM to SN07
5. On the CICM EM, using the provided interface, retrieve the middlebox IDs for all NATs from GWCEM. This will update the NAT information stored in the CICM EM with the new SN07 format middlebox ids.
6. Upgrade CICMs to SN07. CICM upgrade from SN06.2 to SN07 will be done by adding SN07 CICM to GWC and migrating users across to new CICM. The SN07 CICM will have the new format middlebox IDs. All terminals will re-login as part of this upgrade, hence all get new format IDs associated with them in the CICM.

## 1.12 Glossary

| Term  | Description                           |
|-------|---------------------------------------|
| GUI   | Graphical User Interface              |
| GWC   | Gateway Controller                    |
| GWCEM | Gateway Controller Element Manager    |
| NAT   | Network Address Translation           |
| LBL   | Limited Bandwidth Link                |
| VCAC  | Virtual Connections Admission Control |

## 1.13 Appendix A: XML validation schemas

```

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    version="1.0"
    xml:lang="en" >

                                                                    <!--
*****
***** -->
    <!-- * Define AssocMG Method Parameters -->

                                                                    <!--
*****
***** -->
    <xsd:complexType name="assocMGMethodType">
        <xsd:all>
            <xsd:element name="Parameters" type="assocMGParamsType" />
        </xsd:all>
        <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
    </xsd:complexType>
    <xsd:complexType name="assocMGParamsType">
        <xsd:sequence>
            <xsd:element name="mgUIName" type="NoSpaceNameType" />
            <xsd:element name="mgProfileName" type="NoSpaceNameType" />
            <xsd:element name="mgIpAddr" type="IPAddressType" />
            <xsd:element name="mgProtocolType" type="MGProtocolType" />
            <xsd:element name="mgProtocolVersion" type="xsd:decimal" />
            <xsd:element name="mgProtocolPort" type="xsd:unsignedShort" />
            <xsd:element name="mgSiteName" type="MGSiteNameType" minOccurs="0" />
            <xsd:element name="gwcUIName" type="GWCNameType" minOccurs="0" />
            <xsd:element name="reservedTerminations" type="ReservedTerminationsType"
minOccurs="0" />
            <xsd:choice minOccurs="0">
                <xsd:element name="pepServerName" type="xsd:token" />
                <xsd:element name="itransMiddleboxName" type="xsd:token" />
                <xsd:element name="rootMiddleboxName1" type="NoSpaceNameType" />
            </xsd:choice>
            <xsd:element name="rootMiddleboxName2" type="NoSpaceNameType" minOccurs="0" />
            <xsd:element name="rootMiddleboxName3" type="NoSpaceNameType" minOccurs="0" />
            <xsd:element name="rootMiddleboxName4" type="NoSpaceNameType" minOccurs="0" />
            <xsd:element name="rootMiddleboxName5" type="NoSpaceNameType" minOccurs="0" />
        </xsd:sequence>
    </xsd:complexType>

<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    version="1.0"

```

```

xml:lang="en" >

                                                                 <!--
*****
***** -->
<!-- * Define changeRootMiddleboxes Method Parameters -->
                                                                 <!--
*****
***** -->
<xsd:complexType name="changeRootMiddleboxesmethodType">
  <xsd:all>
    <xsd:element name="Parameters" type="changeRootMiddleboxesparamsType" />
  </xsd:all>
  <xsd:attributeGroup ref="Usn_VersionAttrbGroup" />
</xsd:complexType>
<xsd:complexType name="changeRootMiddleboxesparamsType">
  <xsd:sequence>
    <xsd:element name="MGname" type="NoSpaceNameType" />
    <xsd:element name="rootMiddleboxName1" type="NoSpaceNameType" />
    <xsd:element name="rootMiddleboxName2" type="NoSpaceNameType" minOccurs="0" />
    <xsd:element name="rootMiddleboxName3" type="NoSpaceNameType" minOccurs="0" />
    <xsd:element name="rootMiddleboxName4" type="NoSpaceNameType" minOccurs="0" />
    <xsd:element name="rootMiddleboxName5" type="NoSpaceNameType" minOccurs="0" />
  </xsd:sequence>
</xsd:complexType>

```

## 1.14 Appendix B: Error codes and messages

**Table 2 Return codes when command is unsuccessful**

| Cause of error                                                        | Return code | Example return messages                                                                                                                               |
|-----------------------------------------------------------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Media Gateway hasn't got a ITransRoam service type in its profile | 16          | The use of Root Middle Box name(s) is invalid. The Gateway does not support this internet transparency service.                                       |
| The GWCEM has failed the provisioning method.                         | 21          | GWCEM failed to associate the MG with the GWC, Reason the number of distinct Middleboxes used gwc [ <i>gwc id</i> ] exceeds the limit of 2000 per GWC |
| Incorrect command version in query                                    | 301         | Unsupported version                                                                                                                                   |

| Cause of error                                                                                                 | Return code | Example return messages                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Platform applications internal error: OSS Interface applications cannot connect to required server application | 302         | Interfacing error                                                                                                                                            |
| Unable to change RootmiddleboxNames because of a database error occurred                                       | 303         | Database error occurred during setting of Root MiddleboxNames                                                                                                |
| Unable to add/change RootmiddleboxNames because of invalid input data                                          | 304         | Cannot set RootMiddleboxName because VCAC internal counting constraint hit. LBLs must be on one GWC.                                                         |
| User is not a member of any of the user groups allowed to perform this action                                  | 501         | Insufficient permissions to perform this operation                                                                                                           |
| General SAX parser exceptions                                                                                  | None        | caught ParserEx, Reason: Caught SAXException trying to parse xml-Details:org.xml.sax.SAXParseException: Element type "rootMiddleboxName6" must be declared.> |

### 1.14.1 Example Return Messages

#### Error message example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList>
  <Command>
    <Interface>cs2kCfgMgrIf</Interface>
    <Methods>
      <assocMG usn="1" version="1.0">
        <Parameters>
          <mgUIName>MGBOBXML.5</mgUIName>
          <mgProfileName>CICM</mgProfileName>
          <mgIpAddr>22.33.44.56</mgIpAddr>
          <mgProtocolType>4</mgProtocolType>
          <mgProtocolVersion>1.0</mgProtocolVersion>
          <mgProtocolPort>2944</mgProtocolPort>
          <gwcUIName>GWC-113</gwcUIName>
          <reservedTerminations>5</reservedTerminations>
          <rootMiddleboxName1>NAT1</rootMiddleboxName1>
          <rootMiddleboxName2>NAT2</rootMiddleboxName2>
          <rootMiddleboxName3>NAT3</rootMiddleboxName3>
          <rootMiddleboxName4>NAT4</rootMiddleboxName4>
          <rootMiddleboxName5>NAT5</rootMiddleboxName5>
        </Parameters>
      </assocMG>
    </Methods>
  </Command>
</CommandList>
<?xml version="1.0" encoding="UTF-8" ?>
?><CommandList><Response><Interface>cs2kCfgMgrIf</Interface><Methods><assocMG
```



version="1.0"><RC>21</RC><MsgTxt>GWCEM failed to associate the MG with the GWC, Reason is The Root Middlebox : NAT1 does not exist </MsgTxt></assocMG></Methods></Response></CommandList>

### Success message example:

```
<?xml version="1.0" encoding="UTF-8" ?>
<CommandList><Response>
<Interface>cs2kCfMgrIf</Interface>
<Methods>
<assocMG usn="1" version="1.0">
<ReturnData><Row>
<gwcUIName>GWC-113</gwcUIName>
<gwcIpAddr>47.165.172.76</gwcIpAddr>
<mgNodeName>LG 00 1</mgNodeName>
</Row><RC>0</RC>
<MsgTxt>The MG was successfully associated with a GWC</MsgTxt>
</ReturnData>
</assocMG>
</Methods>
</Response></CommandList>
```

## 1.15 Appendix C: XML Commands: description of method parameters

### 1.15.1 Parameter definitions

- **encoding??**
- **version** - The version refers to the version of the method or operation - e.g., the changeRootMiddleboxNames operation may have version 1.0 and 2.0, where version 1.0 takes parameters X and Y and version 2.0 takes parms X, Y, and Z. TYPE *decimal*.
- **usn** - Unique Sequence Number. This parameter is introduced to facilitate sending multiple XML commands in one file. This parameter value will be used to match the responses with the requests. TYPE *integer*.
- **ReturnCode value**- A numeric value indicating the result of the attempted operation (see Table 3, for range and definitions of each possible value). TYPE *string*.
- **Return code text**- Appropriate text that describes the result of the operation. TYPE *string*.
- **rootMiddleboxName1(1..5)** - The Middlebox name(s) of the root node middlebox(es) that encompasses the enterprise network that the CICM gateway operates with.. TYPE *NoSpaceNameType*. (32 character token without spaces, see xsd definitions in Appendix A, section 1.13)

### 1.15.2 Method Parameters

Method parameters are defined below. Input data is mandatory except where indicated otherwise.

1. **AssocMG** - Method to associate a gateway to the CS2K. This method has the following NEW parameters: (only NEW ones described, see standard documentation for the other definitions).
  - Input data:
    - usn
    - version
    - rootMiddleboxName1 (Optional, Cannot be included as well as itransMiddleboxName or pepServerName) - defines the 1st RootMiddlebox for this gateway.
    - rootMiddleboxName2 (Optional, Cannot be included as well as itransMiddleboxName or pepServerName) - defines the 2nd RootMiddlebox for this gateway.
    - rootMiddleboxName3 (Optional, Cannot be included as well as itransMiddleboxName or pepServerName) - defines the 3rd RootMiddlebox for this gateway.
    - rootMiddleboxName4 (Optional, Cannot be included as well as itransMiddleboxName or pepServerName) - defines the 4th RootMiddlebox for this gateway.
    - rootMiddleboxName5 (Optional, Cannot be included as well as itransMiddleboxName or pepServerName) - defines the 5th RootMiddlebox for this gateway.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.
2. **QueryMG** - Method that gets the gateway information from a CS2K. This method has the following NEW Output parameters: (only NEW ones described, see standard documentation for the other definitions):
  - Output data:
    - rootMiddleboxName1 - defines the 1st RootMiddlebox for this gateway.
    - rootMiddleboxName2 - defines the 2nd RootMiddlebox for this gateway.
    - rootMiddleboxName3 - defines the 3rd RootMiddlebox for this gateway.
    - rootMiddleboxName4 - defines the 4th RootMiddlebox for this gateway.

- rootMiddleboxName5 - defines the 5th RootMiddlebox for this gateway.
- 
- 3. **changeRootMiddleboxes** - Method that changes the rootMiddleboxes for a given gateway. This method has the following parameters:
  - Input data:
    - usn
    - version
    - MGname indicates the gateway that this change command is for.
    - rootMiddleboxName1 - defines the 1st RootMiddlebox.
    - rootMiddleboxName2 - (Optional) defines the 2nd Root Middlebox.
    - rootMiddleboxName3 - (Optional) defines the 3rd Root Middlebox.
    - rootMiddleboxName4 - (Optional) defines the 4th Root Middlebox.
    - rootMiddleboxName5 - (Optional) defines the 5th Root Middlebox.
  - Output data:
    - usn (value should be the same as the input)
    - version (value should be the same as the input)
    - ReturnCode - indicates via an integer value if the command has been successful or, if not, the error type and includes a brief textual message with further information.

## ***Product = Centrex IP Client Manager (CICM)***

### **A00007244--GIC and GIAC Support on CICM and MG9K**

#### ***Excerpts from the Test Plan***

#### **1.1 Applicable Solution(s)**

UA-IP, IAW

#### **1.2 Feature Overview**

##### **1.2.1 GIC Feature Overview**

The MBS Group Intercom (GIC) allows an end user to terminate on a member of a selected group using abbreviated dialing. An intercom group can have a maximum size of ten members, 1000 members, or 10 000 members. End users

in a ten member group dial a single digit, 0 to 9, to reach others members in their group. End users in a 100 member group dial a two digit number, 00 to 99. In a 1000 member group, end users dial a three digit code, 100 to 999. In a 10 000 member group, end users dial a four digit code, 0000 to 9999. A Meridian business set (MBS) can have members of several different GIC groups. A separate feature key must represent each group.

To activate MBS Group Intercom, the end user presses the GIC key. The end user dials the correct number of digits. If the call terminates on another MBS, the system rings the GIC key associated with the originating GIC group. The called party must press the GIC key to answer. If the call terminates on a Unity or 500/2500 set, the called party goes off-hook to answer the call. Digits dialed after the end user presses a GIC key appear as dialed. Calls incoming on a GIC key display the GIC member number of the originator.

#### 1.2.1.1 GIC Individual Paging

Individual GIC paging provides for one member of a group intercom (GIC) groups, using the GIC key of MBS set, to activate built-in alerting speaker of another GIC group member's MBS for paging purposes. Both GIC group members must be in same GIC group.

To use GIC individual paging feature, the caller presses the GIC key and dials appropriate GIC member number. Following the first ring, the caller again presses the GIC key. A one-way connection is established, and the caller can then talk over speaker. The called group member can establish a two-way conversation by either pressing the ON key of the handsfree-unit or by lifting the handset.

GIC Individual Paging feature requires GICPAGE option in table CUSTSTN for related customer group

#### 1.2.1.2 GIC and SERVORD command

The assignment of option GIC to an MBS using the ADO command appears in the following SERVORD example. Assignment of option GIC occurs to key 5. The designated name of the line is SMITH. The GIC member number (GICMEMNO) is 24. The SMDR records are a requirement.

SERVORD example for MBS Group Intercom in no-prompt mode

```
>ADO $ 2 0 1 25 2 GIC SMITH 24 Y N $
```

QGRP show the output of GIC group:

```
>qgrp gic HOST 02 0 01 26 4
```

```
SORT_BY_LEN_OR_MEM: LEN
```

```
>len
```

GIC GROUP

-----  
HOST 02 0 01 26      KEY 4      MEMBER 23  
DN 1027835002

HOST 02 0 01 25      KEY 2      MEMBER 24  
DN 1027835001

The number of members in the GIC GROUP "SMITH" is 2

### 1.2.2 GIAC Feature Overview

Group Intercom All Call (GIAC) allows an MBS end user to page up to 100 members (with MDC00077 SOC option) for one-way speech path and up to 30 members for two-way speech path in his or her designated Group Intercom (GIC) group simultaneously, and establish a conference with the paged members. This functionality is extremely useful in situations where common announcements need to be broadcast to several individuals in the same GIC group. These individuals must be equipped with Meridian business sets (MBS). An individual group member hears the page over his or her own set's built-in speaker, and can (when required) respond to the originator.

To activate **manual** GIAC paging, a member lifts the handset, presses the GIC key, and presses the octothorpe (#) key on the dial pad. The member who activates GIAC is known as the originator of the call. Then originator presses GIC key again to start paging. When GIAC is activated, a conference bridge is established, and each member of the GIAC group is placed on a port of the conference circuit. The paged group members can establish a two-way conversation by either pressing the ON key of the handsfree-unit or by lifting the handset.

To use **automatic** GIAC paging (PAGING field is datafilled as "Y"), a member lifts the handset, presses the GIC key. The member who activates GIAC is known as the originator of the call. Then when GIAC is activated, a conference bridge is established, and each member of the GIAC group is placed on a port of the conference circuit. The paged group members cannot establish a two-way conversation by either pressing the ON key of the handsfree-unit or by lifting the handset. Automatic GIAC paging only supports one-way speech path (from originator to paged members).

To use automatic paging function of GIAC feature, MDC00077 SOC implemented by activity A0004007 status should be set to ON.

In order to use GIAC, an individual with an MBS must be a member of an intercom group that has GIAC datafilled in Table KSETFEAT (Business Set

and Data Unit Feature). When a member activates GIAC, the other members that belong to the same GIAC group are paged. A GIAC group can have a maximum of 100 (with MDC00077 SOC option) members (including the originator).

### 1.2.2.1 GIAC and SERVORD command

The following SERVORD example shows how Group Intercom All Call is added to a line using the ADO command.

SERVORD example for MBS Group Intercom in no-prompt mode

```
>ADO $ 02 0 01 25 2 GIAC 7 Y N $
```

QGRP show the output of GIAC group:

```
>qgrp
```

```
GRP_TYPE:
```

```
>giac
```

```
LEN_OR_LTID:
```

```
>HOST 02 0 01 26
```

```
KEY:
```

```
>4
```

GIAC GROUP

-----

```
HOST 02 0 01 25      KEY 2      MEMBER 24
```

```
HOST 02 0 01 26      KEY 4      MEMBER 23
```

THE NUMBER OF MEMBERS IN THE GIAC GROUP "7" IS 2

## ***Product = Centrex IP Client Manager (CICM)***

### **A00007253--MADN Ring Forward Support for CICM and MG9K** ***Excerpts from the Test Plan***

#### **1.1 Applicable Solution(s)**

UA-IP, IAW

## 1.2 Feature Overview

### 1.2.1 MADN description

A directory number (DN) that is assigned to more than one business set or single line set is called a MADN. The telephone sets that are assigned this DN form a MADN group. MADN groups can be comprised of 2 to 32 members and configured in either a single call arrangement (SCA) or multiple call arrangement (MCA). The option MDN must be assigned to the telephone line appearance.

### 1.2.2 Single call arrangement (SCA)

Single call arrangement allows only one call to be active on the SCA group. The active call may be an origination by a SCA member or an incoming call presented to all the SCA members. The originator or answering member will have privacy on the call that excludes all other members. The lamps associated with the SCA appearances on all business set members will be on. The call will remain private, with the active member controlling the option, privacy release (PRL). When the controlling member depresses the PRL key or dials the privacy release activation code (PRLA), the other members will be notified by a blinking lamp associated with the SCA appearance. Upon activation of privacy release, one SCA member may conference into the call.

The MADN ring forward (MRF) option provides four ringing options for calls offered to SCA groups. The ringing options are:

- **abbreviated** - the line appearance rings from call termination until the timer expires.
- **delayed** - the line appearance rings after the timer expires.
- **always** - the line appearance rings from the time the call terminates until it is answered or the caller abandons the call.
- **never** - the line appearance does not ring when a call terminates on the SCA group.

The timer that controls the delayed or abbreviated ring is set on a SCA basis. (0 or 12-60 seconds).

The MADN ring forward manual (MRFM) option provides for the forwarding of ringing of SCA group appearances. The MRFM option allows a station with MRF and the abbreviated ringing option to manually stop its ringing before the timer expires. This is done by pressing a MRFM key. Once the MRFM key is pressed any set with the delayed ringing option begins to ring. MRFM is a subset feature. Therefore, each DN that requires this manual capability must be key listed when this feature is assigned to the business set. One business set can have several MRFM keys. The MADN ring forward (MRF) option must

be assigned to the SCA group before an appearance of that SCA may be assigned to the keylist of the MRFM key.

### 1.2.3 MADN Ring Forwarding and SERVORD command

The following SERVORD example shows how MADN Ring Forward is added to an existing SCA MADN line using the SERVORD ADO command. The group is assigned MRF. The system prompts the end user for the MRF\_RING to assign special ringing to the MADN group member.

**SERVORD example for Assigning MADN Ring Forward to an existing SCA MADN line in prompt mode.**

```
> ADO
SONUMBER :      NOW      92    1    2    AM
>
DN_OR_LEN:
>00 0 00 04
OPTKEY:
>1
OPTION:
>MRF
AUTO:
>Y
MRF_TIMER:
>12
MRF_RING:
>ABBR
OPTKEY:
>$
```

**SERVORD example for MADN Ring Forward in no-prompt mode**

```
> ADO $ 00 0 00 04 1 MRF Y 12 ABBR $
```

The following SERVORD example shows how MADN Ring Forward is added to an existing SCA MADN line using the SERVORD ADO command. The group is assigned MRF. The system prompts the end user for the MRF\_RING to assign special ringing to the MADN group member.



**SERVORD example for Assigning MADN Ring Forward to an MBS key in prompt mode**

```
> ADO
SONUMBER :      NOW      90    1    2    AM
>
DN_OR_LEN:
>02 01 02 22
OPTKEY:
>5
OPTION:
>MRFM
KEYLIST:
>1
KEYLIST:
>2
KEYLIST:
>$
KEYLIST:
>$
```

**SERVORD example for MADN Ring Forward Manual in no-prompt mode**

```
> ADO $ 02 01 02 22 5 MRFM 1 2 $ $
```





# SN08 Feature Deltas

***Product = IEMS***

## **A00006756--NSSwitch Implementation in IEMS**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Introduction**

This document explains how NSSwitch (Name Service Switch) can be implemented in IEMS. This document covers the following:

- A brief description about the proposed design for NSS implementation in IEMS with a workflow chart
- NSS implementation details
- Major work items involved
- New C APIs that are to be added
- Changes on the client side

Basically, NSSwitch is a standard used in all Unix flavor operating systems, founded by Sun Micro Systems. The OS uses a number of databases of information about hosts, users (passwd/shadow), groups etc., Data for these hostnames and addresses may be found in /etc/hosts, NIS, NIS+ or DNS. Supporting NSSwitch enables IEMS as NSSwitch compliant.

### 1.3 Overview of the NSSwitch Design

The following list depicts the workflow of the implementation of the method “isAuthorized”.

- 1 Request comes in to the Authorization Engine.
- 2 Gets all the groups for the user through NSSwitch. Here, just a call of the URL will return the required data.
- 3 For each group, gets the authorized operations from the Database through Relational classes.
- 4 Applies Security Policy and returns the result.
- 5 For Admin user who wants to create a new user, first authorization check is done (as to whether he is authorized to create a new user).
- 6 If the admin user has got the permission, he directly invokes the AdminAPI and creates a new user. Here NSSwitch API will not be invoked.

### 1.4 Overview of the NSSwitch Implementation

The following list depicts NSSwitch implementation details in IEMS.

- 1 The call getGroup comes from AuthEngine API.
- 2 AuthEngine invokes the Https URL and gets the result regarding Group Information.
- 3 The Servlet calls the **PamPlus.java** which contains the native call for getpwnam(),getgrnam(). (This part is already done.)
- 4 NSSwitch SPI will be invoked since this entry is given in the *nsswitch.conf*. This SPI will contact the Security Server through socket.
- 5 The Security Server gets data from the Security DB through RelationalAPI and returns back to the AuthEngine.

### 1.5 Major Work Involved

Two new Tables PLATFORMUSERDETAILS, PLATFORMGROUPDETAILS have to be created with detailed information about users and groups. These two tables will contain all the information of */etc/passwd*, */etc/shadow*, */etc/group* files.

Schema for the new tables will look like following:

#### **PLATFORMUSERDETAILS:**

| S.No | COLUMN_NAME | DATA_TYPE | PRIMARY_KEY | REMARKS                                                                                 |
|------|-------------|-----------|-------------|-----------------------------------------------------------------------------------------|
| 1    | USERNAME    | VARCHAR2  | YES         |                                                                                         |
| 2    | USER_UID    | NUMBER    |             |                                                                                         |
| 3    | GROUP_GID   | NUMBER    |             | Primary Group ID, It should be any one of the value from PLATFORMGROUPDETAILS.GROUP_GID |
| 4    | GECOS       | VARCHER2  |             |                                                                                         |
| 5    | HOME_DIR    | VARCHER2  |             |                                                                                         |
| 6    | LOGIN_SHELL | VARCHER2  |             |                                                                                         |
| 7    | LAST_CHANGE | NUMBER    |             |                                                                                         |
| 8    | MIN         | NUMBER    |             |                                                                                         |
| 9    | WARN        | NUMBER    |             |                                                                                         |
| 10   | INACTIVE    | NUMBER    |             |                                                                                         |

**PLATFORMGROUPDETAILS:**

| S.No | COLUMN_NAME   | DATA_TYPE | PRIMARY_KEY | REMARKS   |
|------|---------------|-----------|-------------|-----------|
| 1    | GROUPNAME     | VARCHAR2  | YES         |           |
| 2    | GROUP_GID     | NUMBER    |             |           |
| 3    | GROUPPASSWORD | VARCHAR2  |             | NOT USED. |

**1.6 C API implementation:**

The following apis needs to be implemented as part of this operation.

**/etc/passwd:**

- 1 struct passwd \*getpwnam(const char \*name);
- 2 struct passwd \*getpwnam\_r(const char \*name, struct passwd \*pwd, char \*buffer, int buflen);
- 3 struct passwd \*getpwent(void);
- 4 struct passwd \*getpwent\_r(struct passwd \*pwd, char \*buffer, int buflen);
- 5 struct passwd \*getpwuid(uid\_t uid);

```
6 struct passwd *getpwuid_r(uid_t uid, struct passwd *pwd, char *buffer,
  int buflen);
```

```
7 void setpwent(void);
```

```
8 void endpwent(void);
```

#### **/etc/shadow:**

```
1 struct spwd *getspnam(const char *name);
```

```
2 struct spwd *getspnam_r(const char *name, struct spwd *result, char
  *buffer, int buflen);
```

```
3 struct spwd *getspent(void);
```

```
4 struct spwd *getspent_r(struct spwd *result, char *buffer, int buflen);
```

```
5 void setspent(void);
```

```
6 void endspent(void);
```

#### **/etc/group:**

```
1 struct group *getgrnam(const char *name);
```

```
2 struct group *getgrnam_r(const char *name, struct group *grp, char
  *buffer, int bufsize);
```

```
3 struct group *getgrent(void);
```

```
4 struct group *getgrent_r(struct group *grp, char *buffer, int bufsize);
```

```
5 struct group *getgrgid(gid_t gid);
```

```
6 struct group *getgrgid_r(gid_t gid, struct group *grp, char *buffer, int
  bufsize);
```

```
7 void setgrent(void);
```

```
8 void endgrent(void);
```

```
9 getgroupsbymember();
```

### **1.6.1 Sample result of some of the new APIs:**

The getpwnam(char\* username) will return a structure. This structure will contain following data from the new table.

| S.No | Structure Variable | Definition | Data |
|------|--------------------|------------|------|
|------|--------------------|------------|------|

|   |                    |                                  |                                                                   |
|---|--------------------|----------------------------------|-------------------------------------------------------------------|
| 1 | char<br>*pw_name   | user's login<br>name             | The incoming argument <OR><br><i>PLATFORMUSERDETAILS.USERNAME</i> |
| 2 | char<br>*pw_passwd | no longer<br>used                | Empty String                                                      |
| 3 | uid_t pw_uid       | user's uid                       | <i>PLATFORMUSERDETAILS.USER_UID</i>                               |
| 4 | gid_t pw_gid       | user's gid                       | <i>PLATFORMUSERDETAILS.GROUP_GID</i>                              |
| 5 | char<br>*pw_gecos  | typically<br>user's full<br>name | <i>PLATFORMUSERDETAILS.GECOS</i>                                  |
| 6 | char *pw_dir       | user's home<br>dir               | <i>PLATFORMUSERDETAILS.HOME_DIR</i>                               |
| 7 | char<br>*pw_shell  | user's login<br>shell            | <i>PLATFORMUSERDETAILS.LOGIN_SHELL</i>                            |

Result for getsppnam(char\* username) is tabulated below

| S.No | Structure<br>Variable | Definition                      | Data                                                              |
|------|-----------------------|---------------------------------|-------------------------------------------------------------------|
| 1    | char<br>*sp_namp      | login name                      | The incoming argument <OR><br><i>PLATFORMUSERDETAILS.USERNAME</i> |
| 2    | char<br>*sp_pwdp      | encrypted<br>passwd             | UserPasswordTable.PASSWORD                                        |
| 3    | long<br>sp_lstchg     | date of last<br>change          | <i>PLATFORMUSERDETAILS.LAST_CHANGE</i>                            |
| 4    | long sp_min           | min days to<br>passwd<br>change | <i>PLATFORMUSERDETAILS.MIN</i>                                    |
| 5    | long sp_max           | max days to<br>passwd<br>change | <i>UserConfTable.PASSWORDAGE</i>                                  |
| 6    | long<br>sp_warn       | warning<br>period               | <i>PLATFORMUSERDETAILS.WARN</i>                                   |
| 7    | long<br>sp_inact      | max days<br>inactive            | <i>PLATFORMUSERDETAILS.INACTIVE</i>                               |

|   |                          |                        |                              |
|---|--------------------------|------------------------|------------------------------|
| 8 | long<br>sp_expire        | account<br>expiry date | <i>UserConfTable.USERAGE</i> |
| 9 | unsigned<br>long sp_flag | not used               | (Integer ZERO) 0             |

Result for getgrnam(char\* name) is tabulated below:

| S.No | Structure<br>Variable | Definition                                  | Data                                                                |
|------|-----------------------|---------------------------------------------|---------------------------------------------------------------------|
| 1    | char<br>*gr_name      | the name of<br>the group                    | The incoming argument <OR><br><i>PLATFORMGROUPDETAILS.GROUPNAME</i> |
| 2    | char<br>*gr_passwd    | the<br>encrypted<br>group<br>password       | <i>PLATFORMGROUPDETAILS.GROUPPASSWORD</i>                           |
| 3    | gid_t gr_gid          | the<br>numerical<br>group ID                | <i>PLATFORMGROUPDETAILS.GROUP_GID</i>                               |
| 4    | char<br>**gr_mem      | vector of<br>pointers to<br>member<br>names | Achieved through our implementation.                                |

### 1.6.2 Client Side Changes

In the Security UI, we changed the createUser wizard such that the wizard will prompt for additional User Attributes. A few additional attributes specific to each user are obtained from the IEMS Client GUI. The list of additional attributes is as follows.

- a** gecost - Deceptive text field which contains information about the user.
- b** min - The minimum number of days required between password changes(default=1).
- c** warn - The number of days before the password expires that the user is warned(default=7).
- d** inactive - The number of days of inactivity allowed for each user after which the account will be disabled(default=0).
- e** Login Shell - The login shell that will be invoked after a successful login. User has two options (a) no-access (b) restricted. Currently



'/usr/bin/nash' is populated if no-access option is chosen and '/bin/sh' is populated if restricted option is chosen. The default value is 'no-access'.

**Note:** Changes will be made to show UID,GID & LOGINSHELL

The following is a screen shot provided to enter the additional User attributes in the Add User Wizard. This screen can be invoked from the 3<sup>rd</sup> screen of the Add User Wizard, by clicking on the “Advanced” Button. If the user does not click on this button, or no operation is performed on this GUI, default values for these fields will be populated in the database.

ScreenTitle

Java Application Window

Additional Details

Gcos

Min (days) 1

Inactive (days) 7

Warn (days) 7

Login Shell

☒ no-access

☐ restricted

Expiry: Sun, 8 Aug 2004

Please enter the user's real Name in this field (Mr. Foo Boo)

OK Cancel

The default values given for each of the above fields is configurable. The default values which can be provided currently are present in the following location: `IEMSHOME/conf/defaultUserAttribute.prop`. The format of this file is as below.

Currently the file contents are as follows.

# Security Default Values. The values for the following 5 should be integers

MIN=1

```
WARN=7
INACTIVE=0
PASSWORDAGE=30
ACCOUNTAGE=0
# LOGIN_SHELL can have noaccess/restricted for
other values the behavior is undefined
LOGIN_SHELL=noaccess
```

Changes done in this file will be reflected in the IEMS Client GUI after the client is restarted successfully.

### 1.6.3 Modifying the attributes of a User

The additional attributes of each user can be modified from the IEMS Client GUI. To modify the user attributes, please perform the following steps.

- 1 Invoke the Security Administration GUI by clicking on Tools->SecurityAdministration (or) Alt+S keys.
- 2 All the users will be listed under the “Users” Node in the Tree.
- 3 Click on the user for whom the user attributes has to be modified.
- 4 Click on the “User Profile” tab on the right hand side of the user list tree.
- 5 Click on the “Setting Profile” button on this panel, a panel which has user attributes will be popped up.
- 6 Click on the “Advanced” Button in this panel to view the additional properties of the user. After modifying the attributes, click on the OK button to modify the additional user attributes.

### 1.6.4 Password Complexity

Password complexity is a set of rules based on which passwords for users are set. The main objective behind this feature is to make a password complex while assigning a password for a user. The rules are as follows.

- Each password shall have a minimum number of characters(default=6)
- Each password shall have a maximum number of characters(default=256)
- Each password shall have at least 3 types of characters
  - lowercase characters(default=1)

- uppercase characters(default=1)
- numbers(default=1)
- special characters(default=0)
- Password shall not be the same as login id of the user.
- While changing a user's password he shall re-use his old password.
- Special characters should be configurable by the administrator.

### 1.6.5 Configuring the default values for Password complexity values

The default values provided above are present in the following file. IEMSHOME/conf/defaultUserAttribute.prop. The format of this file is as explained above.

```
PASSWD_MIN_LENGTH=6
PASSWD_MAX_LENGTH=256
LOWERCASE_COUNT=1
UPPERCASE_COUNT=1
SPECIAL_CHAR_COUNT=0
NUMBER_COUNT=1
SPECIAL_CHARS=`~!@#$%^&*()-_+=[]{}\\|;:','<.>/?`
```

If the administrator needs to change the above default values it can be changed from the above file.

## 1.7 Upgrade Process.

The process of using a revised version of software after using an old version is called the Upgrade process. First the software will be upgraded and then old data will be migrated to the new version. Migration should be manually initiated by the user.

Procedure to invoke the migration script. To migrate the data from SN07 to SN08 please follow the steps given below.

- 1 cd /opt/nortel/iems/current/bin
- 2 sh migrationTool.sh UPGRADE
- 3 The above command will migrate the data from SN07 to SN08
- 4 Now start the IEMS server

### Order of migration

- 1 Add Succession 25 groups
- 2 Migrate list of groups created in IEMS in SN07 with GID & empty password
- 3 Migrate list of users created in IEMS including iemsadm,guest

During IEMS Server start up, all the succession 25 groups will be added to the IEMS database. Then all the operations relevant to these groups will be added to IEMS DB from the SuccessionGroupInfo.xml file. After this operation IEMS will migrate the list of groups created in IEMS along with enumerated GID. Now the users created in IEMS will be migrated with primary group ID as succssn.

## 1.8 Succession 25 group-Operations Mapping

The following table contains the initial mapping of groups & their corresponding mapping permission these operations are provided below.

Brief description of **Succession 25 groups Domains**.

| <i>Domains</i> | <i>Application Mapping</i>                                                                           |
|----------------|------------------------------------------------------------------------------------------------------|
| Trk            | Trunks, trunk based services, small trunking gateways (port level), carrier, carrier based services. |
| Ln             | Line services, line cards, small line gateways.                                                      |
| Mgc            | Media Gateway Controllers: CS2K, GWC, SAM21, 3PC, Storm...                                           |
| Mg             | Media gateways: UAS, Line Gateways, Trunk Gateways.                                                  |
| Ems            | SSPFS based EMSs, GWCEM, SAM21EM, UASEM, etc.                                                        |

### Brief Description of **Succession 25 group Roles**

| <i>Roles</i> | <i>Application Mapping</i>                                                                                                                                                                                                 |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Adm          | Reconfiguration, access to all functions, setup of fundamental configuration, can commission (add/deletet/rehome) base frames/systems (SAM21 frames, Call servers, large gateways), can run service impacting diagnostics. |

|       |                                                                                                                                                                   |
|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rw    | Can see and change configuration and status, can commission and reconfigure elements (GWCs, cards, shelves). Also called improv, for infrastructure provisioning. |
| Sprov | Subscriber provisioning; can see status and configuration and change provisioning data, but cannot change mtc state or do base component configuration.           |
| Mtc   | Maintenance role can see configuration and status, can make changes to status, can run service impacting diagnostics                                              |
| Ro    | The "read only" role can see configuration and status, but cannot make changes to them                                                                            |

It is available as below.

| Operation/<br>Groups     | e<br>m<br>s<br>a<br>d<br>m | e<br>m<br>s<br>r<br>w | e<br>m<br>s<br>s<br>p<br>r<br>o<br>v | e<br>m<br>s<br>m<br>t<br>c | e<br>m<br>s<br>r<br>o | m<br>g<br>a<br>d<br>m | m<br>g<br>r<br>w      | m<br>g<br>s<br>p<br>r<br>o<br>v | m<br>g<br>m<br>t<br>c | m<br>g<br>r<br>o      | m<br>g<br>c<br>a<br>d<br>m | m<br>g<br>c<br>r<br>w | m<br>g<br>c<br>s<br>p<br>r<br>o<br>v | m<br>g<br>c<br>m<br>t<br>c | m<br>g<br>c<br>r<br>o | l<br>n<br>a<br>d<br>m | l<br>n<br>r<br>w      | l<br>n<br>s<br>p<br>r<br>o<br>v | l<br>n<br>m<br>t<br>c | l<br>n<br>r<br>o      | t<br>r<br>k<br>a<br>d<br>m | t<br>r<br>k<br>r<br>w | t<br>r<br>k<br>s<br>p<br>r<br>o<br>v | t<br>r<br>k<br>m<br>t<br>c | t<br>r<br>k<br>r<br>o |  |
|--------------------------|----------------------------|-----------------------|--------------------------------------|----------------------------|-----------------------|-----------------------|-----------------------|---------------------------------|-----------------------|-----------------------|----------------------------|-----------------------|--------------------------------------|----------------------------|-----------------------|-----------------------|-----------------------|---------------------------------|-----------------------|-----------------------|----------------------------|-----------------------|--------------------------------------|----------------------------|-----------------------|--|
| User Admin-<br>istration | T<br>R<br>U<br>E           |                       |                                      |                            |                       | F<br>A<br>L<br>S<br>E |                       |                                 |                       |                       | F<br>A<br>L<br>S<br>E      |                       |                                      |                            |                       | F<br>A<br>L<br>S<br>E |                       |                                 |                       |                       | F<br>A<br>L<br>S<br>E      |                       |                                      |                            |                       |  |
| User Config-<br>uration  | T<br>R<br>U<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E |  |
| Add Users                | T<br>R<br>U<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E |  |
| Assign User<br>To Group  | T<br>R<br>U<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E           | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E                | F<br>A<br>L<br>S<br>E      | F<br>A<br>L<br>S<br>E |  |

|                        |                  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|------------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Remove Users           | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Remove User from Group | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Change Password        | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |
| Get List of Users      | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Set User Permission    | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Set User Profile       | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Clear Audit Trails     | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Alerts                 | T<br>R<br>U<br>E |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |
| Alter Filters          | T<br>R<br>U<br>E |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |                       | T<br>R<br>U<br>E      |                       |                       |                       |

|                           |                  |                  |                       |                       |                       |                  |                  |                       |                       |                       |                  |                  |                       |                       |                       |                  |                  |                       |                       |                       |                  |                  |                       |                       |
|---------------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|
| Get Alert Fil-<br>ters    | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |
| Set Alert Fil-<br>ters    | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E |                       |
| Alert User<br>Operations  | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Set Alert An-<br>notation | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Get Alert De-<br>tails    | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |
| Save Alerts<br>To File    | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Print Alert<br>View       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Clear Alerts              | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Get Alert An-<br>notation | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |

|                               |                  |                  |                       |                       |                       |                  |                  |                       |                       |                       |                  |                  |                       |                       |                       |                  |                  |                       |                       |                       |                  |                  |                       |                       |
|-------------------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|-----------------------|------------------|------------------|-----------------------|-----------------------|
| Get Alert History             | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |
| Alert Pickup                  | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E |                       |
| Delete Alerts                 | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E |                       |
| Maps                          | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |
| Map Editing Operations        | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Threshold Object              | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |
| Add Thresh-<br>old Object     | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Modify<br>Threshold<br>Object | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Delete<br>Threshold<br>Object | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |



|                            |                  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|----------------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Get Thresh-<br>old Objects | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |
| Events                     | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       |
| Event Filters              | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       |
| Get Event<br>Filters       | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |
| Set Event Fil-<br>ters     | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Event User<br>Operations   | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       |
| Save Events<br>To File     | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Print Event<br>View        | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |
| Event Clean-<br>up         | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |                       |

|                          |                  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|--------------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Administrative Operation | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Configure Log Levels     | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Runtime Administration   | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| System Administration    | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Northbound Configuration | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| NTSTD NB Config          | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| SCC2 NB Config           | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| SNMP NB Config           | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |



|                                   |                  |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |                       |
|-----------------------------------|------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Scope Set-<br>tings               | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |                       |
| Create Scope<br>For Group         | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |                       |
| Modify<br>Group Scope<br>Relation | T<br>R<br>U<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |                       |
| Job                               | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |
| Add Job                           | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Delete Job                        | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Topology                          | T<br>R<br>U<br>E | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      |                       |                       |                       |
| Modify Ob-<br>ject                | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | F<br>A<br>L<br>S<br>E |
| Manage And<br>Unmanage<br>Objects | T<br>R<br>U<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | T<br>R<br>U<br>E      | F<br>A<br>L<br>S<br>E |

|                             |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|-----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Add Node                    | T | T | F | F | F | T | T | F | F | F | T | T | F | F | F | T | T | F | F | F | T | T | F | F | F |
|                             | R | R | A | A | A | R | R | A | A | A | R | R | A | A | A | R | R | A | A | A | R | R | A | A | A |
|                             | U | U | L | L | L | U | U | L | L | L | U | U | L | L | L | U | U | L | L | L | U | U | L | L | L |
|                             | E | E | S | S | S | E | E | S | S | S | E | E | S | S | S | E | E | S | S | S | E | E | S | S | S |
| Delete Ob-<br>ject          | T | T | F | F | F | T | T | F | F | F | T | T | F | F | F | T | T | F | F | F | T | T | F | F | F |
|                             | R | R | A | A | A | R | R | A | A | A | R | R | A | A | A | R | R | A | A | A | R | R | A | A | A |
|                             | U | U | L | L | L | U | U | L | L | L | U | U | L | L | L | U | U | L | L | L | U | U | L | L | L |
|                             | E | E | S | S | S | E | E | S | S | S | E | E | S | S | S | E | E | S | S | S | E | E | S | S | S |
| Dump Inven-<br>tory Details | T | T | T | T | F | T | T | T | T | F | T | T | T | T | F | T | T | T | T | F | T | T | T | T | F |
|                             | R | R | R | R | A | R | R | R | R | A | R | R | R | R | A | R | R | R | R | A | R | R | R | R | A |
|                             | U | U | U | U | L | U | U | U | U | L | U | U | U | U | L | U | U | U | U | L | U | U | U | L |   |
|                             | E | E | E | E | S | E | E | E | E | S | E | E | E | E | S | E | E | E | E | S | E | E | E | S |   |

TRUE -> Indicates that the operation is allowed to the group

FALSE ->Indicates that the operation is not allowed to the group

BLANK FIELD denotes that it is not allowed by the child operation may allow or disallow

Operations and permission settings are done as part of the IEMS migration process. The user **will not be able to set any operation/permission from the IEMS Client GUI. The succession groups is non modifiable & non deletable groups.**

## 1.9 Procedure to add a group to existing succession 25 groups.

- 1 Invoke the IEMS Client GUI.
- 2 Add a group using the Add group Wizard [Provision to enter/modify GID will be provided].
- 3 Then add the groupname along with its group id in the successiongroups.prop present in IEMSHOME/conf/ directory.
- 4 The group name and id should be added to the file in the following format.
- 5 groupname=GID

## 1.10 Adding a group name and group id to a reserved list.

This provision helps the user to stop adding a group which is already available in group datasource other than IEMS.

- 1 Edit the file in IEMSHOME/conf/reservedgroups.prop
- 2 Add the reserved groupname in this file in the following format:  
reservedgroupname=GID

Configurable group ID Range can be given in NmsProcessesBE.conf present in IEMSHOME/conf directory, as an argument to Security Process as groupIDRange 12001-14000

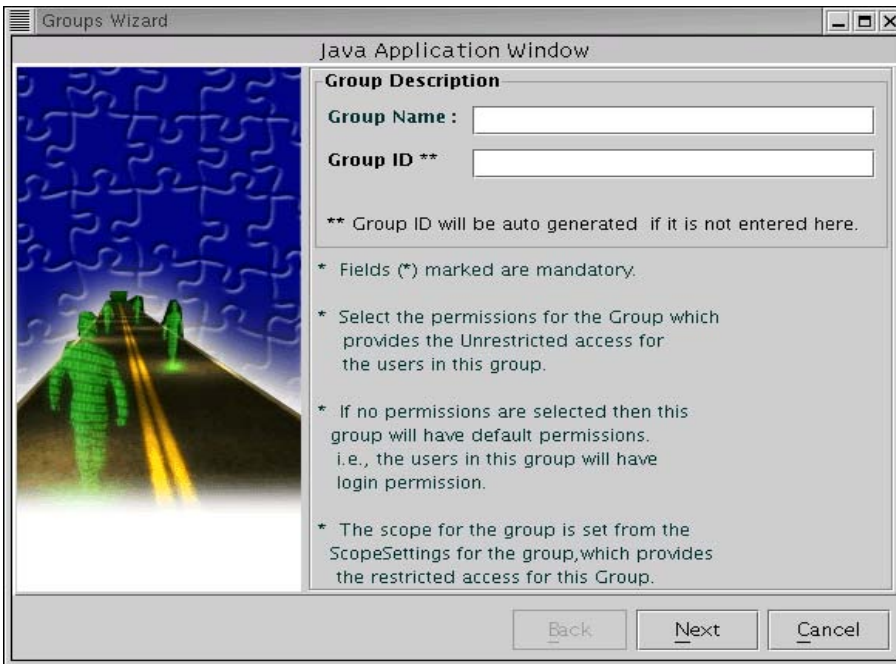
## 1.11 Group ID support

While adding a group the customer has the option to provide a group ID. If this field is left blank then a group ID will be selected from the configurable range provided by the user. The configurable values can be given in the file /opt/nortel/iems/current/conf/NmsProcessesBE.conf.

The contents of this file will be as below.

```
#java com.adventnet.security.authentication.SecurityProcess
PROCESS com.adventnet.security.authentication.SecurityProcess
ARGS SecurityServerPort 7777 maximum_allowed_login_failed_count 0
userIdRange 10001-12000 groupIdRange 12001-14000
```

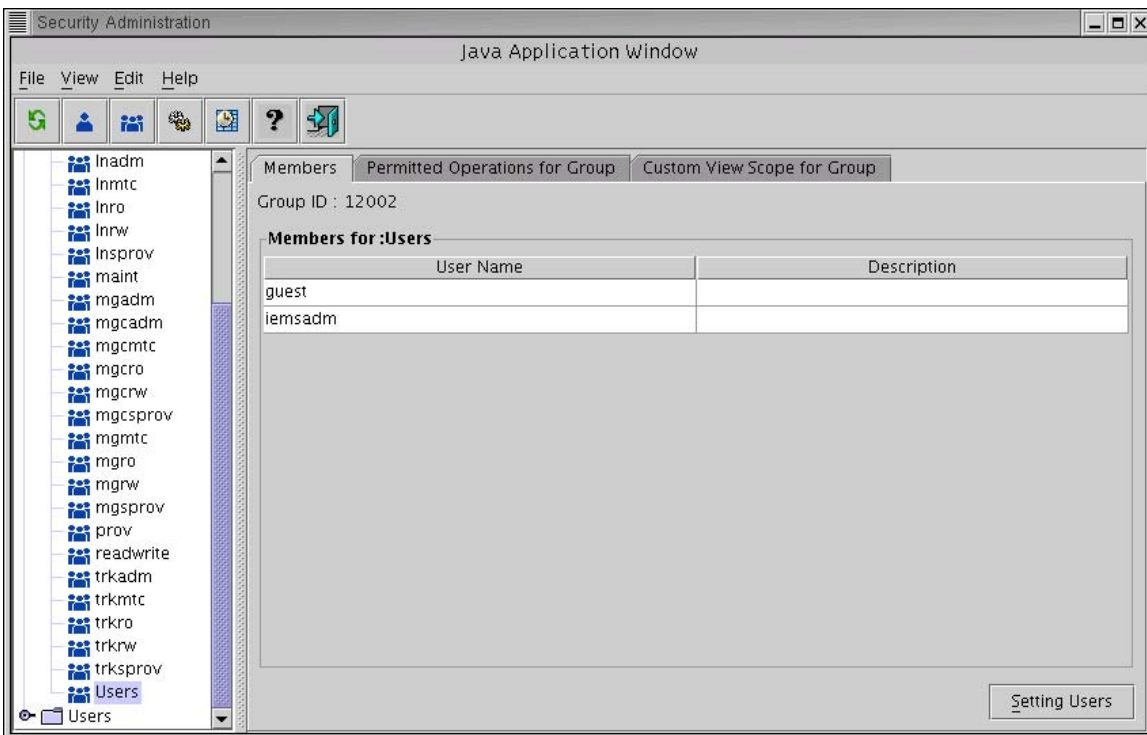
The text given in bold shows the configurable range of group ID's that can be provided by the user. In this configurable range the lower limit is 12001 & the upper limit is 14000. The user can change these values according to their requirements. During group ID enumeration the values will be chosen from this range. The following is a screen shot added to show the group id in IEMS Security Client.



If the number of groups is equal to the range specified in IEMSHOME/NmsProcessesBE.conf then error message stating that the GID range has exhausted will be logged to nmserr.txt file.

#### **To view the group id**

The group ID for each user can be viewed in IEMS Security Client. To view a group id in IEMS Security Client, click on a group name in IEMS Security Client Tree. In the right hand side, click on the Members tab. The screen shot below shows the group id of a selected group "Users".



## 1.12 Conclusion

With the above specifications and design, we can implement NSSwitch support in IEMS.

## 1.13 Device Vs. Domain

| S.No | Device Type                | Auth. Domain |
|------|----------------------------|--------------|
| 1    | APS Mgr                    | EMS          |
| 2    | CS2K Core Mgr              | EMS          |
| 3    | CEM Mgr                    | EMS          |
| 4    | MCS Mgr                    | EMS          |
| 5    | GWC Mgr                    | EMS          |
| 6    | MG9K Mgr                   | EMS          |
| 7    | MG9K                       | MG           |
| 8    | Preside MDM                | EMS          |
| 9    | SAM21                      | MGC          |
| 10   | SAM21Mgr(shelf Controller) | EMS          |



|    |                 |             |
|----|-----------------|-------------|
| 11 | IEMS Mgr        | EMS         |
| 12 | USP             | MG          |
| 13 | PP8600          | MGC         |
| 14 | MS2000          | MG          |
| 15 | STORM           | MGC         |
| 16 | MAS             | MG          |
| 17 | Session Server  | MGC         |
| 18 | CICM            | MG          |
| 19 | CICM EM         | EMS         |
| 20 | MDM Platform    | EMS         |
| 21 | SSPFS           | EMS         |
| 22 | LMM             | LN          |
| 23 | TMM             | TRK         |
| 24 | OSSGate         | LN, TRK, MG |
| 25 | NPM             | EMS         |
| 26 | QOS Collector   | EMS         |
| 27 | Call Agent Core | MGC         |
| 28 | Call Agent Plat | MGC         |
| 29 | CS2K XA-Core    | MGC         |
| 30 | SDM             | EMS         |
| 31 | CBM             | EMS         |

## 1.14 Operation Description

Following table describes the operations name with their explanation.

|                        |                                                                                                                                                                                                  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configure Log Levels   | This operation can be used to set the logging and the corresponding levels for various modules in the Integrated EMS Server.                                                                     |
| Runtime Administration | This operation is a powerful tool to configure the Integrated EMS Server settings from the Integrated EMS without a need for the user to restart the server for the new settings to take effect. |

|                             |                                                                                                                                     |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| SystemAdministration        | This Operation is the entry point all the Administrative operations.                                                                |
| Security Administration     | Security Management is about authenticating a user from logging into Integrated EMS to providing permissions to perform operations. |
| Northbound Configuration    | This operation will enable to set/get Northbound configuration devices using NTSTD,SCC2,SNMP                                        |
| User Configuration          | This operation is used to obtain the link for User Administration.                                                                  |
| Add Users                   | This operation is used to create a new user.                                                                                        |
| Assign User To Group        | This operation is used to assign the user to a new or existing group.                                                               |
| Remove Users                | This operation is used to remove the whole account for a particular user.                                                           |
| Remove User From Group      | This operation is used to remove the particular user from a particular group only.                                                  |
| Change Password             | This operation is used to change the existing password for a particular user.                                                       |
| Get List of Users           | This operation is used to view the list of users present in the database.                                                           |
| Set Users Permission        | This operation is used to sets operations or permissions for the existing users.                                                    |
| Set User Profile            | This operation is used to set profiles for the existing users.                                                                      |
| Clear Audit Trails          | This operation is used for clearing audit trails for the user.                                                                      |
| Add Threshold Object        | This operation is used to create a new Threshold Object to create Threshold Events for a new device or the existing device.         |
| Modify Threshold Object     | This operation is used to modify the existing Threshold Object for making performance analysis better.                              |
| Delete Threshold Object     | This operation is used to remove the existing Threshold Object.                                                                     |
| Get Threshold Object        | This operation is used to view the particular Threshold Object.                                                                     |
| Manage and Unmanage Objects | This operation is used to set the management status of the particular object at run time.                                           |
| Add Node                    | This operation is for adding a new node in the topology.                                                                            |

|                        |                                                                                                                                                                                            |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Delete Object          | This operation is for removing a particular object from the topology.                                                                                                                      |
| Dump Inventory Details | This operation is used to collect the list of discovered devices from the topo database and print them in a text file.                                                                     |
| Map Editing Operations | This operation is mainly used to configure the maps, such as creation of new maps, customization of map hierarchy, map symbol layout, and map symbol renderers through the Integrated EMS. |
| Get Event Filters      | This operation is for viewing the Event Filters present in the server.                                                                                                                     |
| Set Event Filters      | This operation is for modifying existing Event Filters or creating a new Event Filter.                                                                                                     |
| Save Events To File    | This operation is for saving the selected events or the events displayed in the Events Panel.                                                                                              |
| Print Event View       | This operation is for printing either the selected events or events displayed in the Events Panel.                                                                                         |
| Event Cleanup          | This Operation will cleanup all the events in the datastore                                                                                                                                |
| Get Alert Filters      | This operation is for viewing the Alert Filters present in the Server.                                                                                                                     |
| Set Alert Filters      | This operation is for modifying existing Alert Filters or for creating new Alert Filter                                                                                                    |
| Set Alert Annotation   | This operation is for adding notes (annotation) to an alarm.                                                                                                                               |
| Get Alert Details      | This operation is for viewing the details of a particular alarm.                                                                                                                           |
| Save Alerts To File    | This operation is for saving either the selected alarms or the alarms displayed in the current Alarm Panel into a file.                                                                    |
| Print Alert View       | This operation is for printing either the selected alarms or the alarms displayed in the current Alarm Panel.                                                                              |
| Clear Alerts           | This operation is for changing the Alarm Severity to Clear.                                                                                                                                |
| Get Alert Annotation   | This operation is for viewing a particular existing alarm annotation.                                                                                                                      |
| Get Alert History      | This operation is for viewing the alarm history, that is, the change in status of an alarm from the first alarm to the latest alarm.                                                       |

|               |                                                                                                    |
|---------------|----------------------------------------------------------------------------------------------------|
| Alert Pickup  | This operation is used to pick up the alarm. (specify person or allocate resources to handle it)   |
| Delete Alarms | This operation is used to remove a particular alarm, which is of no interest or has been resolved. |
| Add Job       | This operation is for creating a new job.                                                          |
| Delete Job    | This operation is for removing an existing job from the system.                                    |

## ***Product = IEMS***

### **A00006757--IEMS Secure Launch to PP8600**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

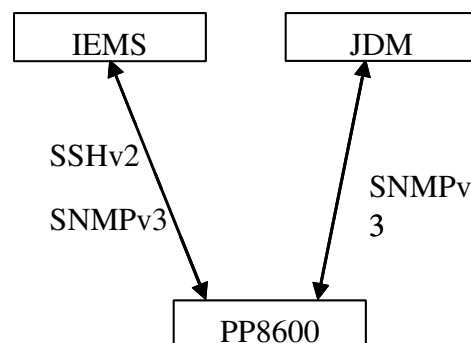
UA-IP

#### **1.2 Description**

This feature defines security measures to be applied to communications between Succession management applications and the Passport 8600 Routing Switch.

The management applications include IEMS and the PP8600 graphical configuration and management tool known as the Java Device Manager (JDM).

All communications between OAM applications and the PP8600 must be authenticated and encrypted. The means for doing this are provided by SNMPv3 and SSHv2.



Configuration is required for all three objects in the diagram above. The bulk of the configuration is in the PP8600. It must be completed before the configuration of IEMS or JDM is performed. There is no interaction between IEMS and JDM, hence, the configuration of one is independent of the other.

### 1.3 Configure the PP8600

The following configuration steps must be performed on the PP8600. This is accomplished by using telnet to log in to the PP8600 configuration console. If the PP8600 is contained in a VLAN, telnet must be performed from a workstation that has access. The IEMS Server would be a logical choice.

The default userid/password is “rwa/rwa”

```
> telnet 47.142.126.223
```

```
*****
* Copyright (c) 2004 Nortel Networks, Inc.          *
* All Rights Reserved                               *
* Passport 8010                                      *
* Software Release 3.7.0.0                           *
*****
```

Login: **rwa**

Password: **\*\*\***

The Software Release level must be 3.7 or greater. After successful login the prompt will appear.

```
PP8600:5#
```

The string shown as a prefix (in this case, PP8600) is the mib-2 object, SNMPv2-MIB::sysName.0. It can be changed with the command,

```
config cli prompt <new-prompt>
```

Entering a question mark (?) will display a list of commands that are available at the current context. It will also display a list of sub-contexts that can be entered via the sub-context name. This is akin to traversing a hierarchy of commands.

The command info will display the state of current context and list the available sub-contexts. The state of a context is a list of attributes and corresponding values.

Configuration is done via the config context. Enter the context name.

```
PP8600:5# config
```

The prompt will change to

```
PP8600:5/config#
```

### 1.3.1 Notes on shell cursor movement and editing

- Left and Right arrow keys will move the cursor backward and forward on command line.
- Up and Down arrow keys move backward and forward in the command stack
- Ctrl-a moves the cursor to beginning of command line
- Ctrl-e moves the cursor to end of command line
- Ctrl-h is a destructive backspace. The Backspace key does nothing.
- You are always in insert mode.
- Ctrl-d is passed to telnet/ssh and will the close session

### 1.3.2 Load Encryption Modules

From the config context, enter the commands,

```
load-encryption-module DES
```

```
load-encryption-module 3DES
```

Encryption modules must be loaded onto the PP8600 flash using ftp or tftp or by use of PCMCIA slot. Refer to the applicable installation guide for Passport 8600 Routing Switch.

If the DES encryption module is not available then SNMPv3 –USM can not be configured. This means that authenticated and encrypted communications between Succession OAM applications and the PP8600 will not be available. SNMP communications will only be via

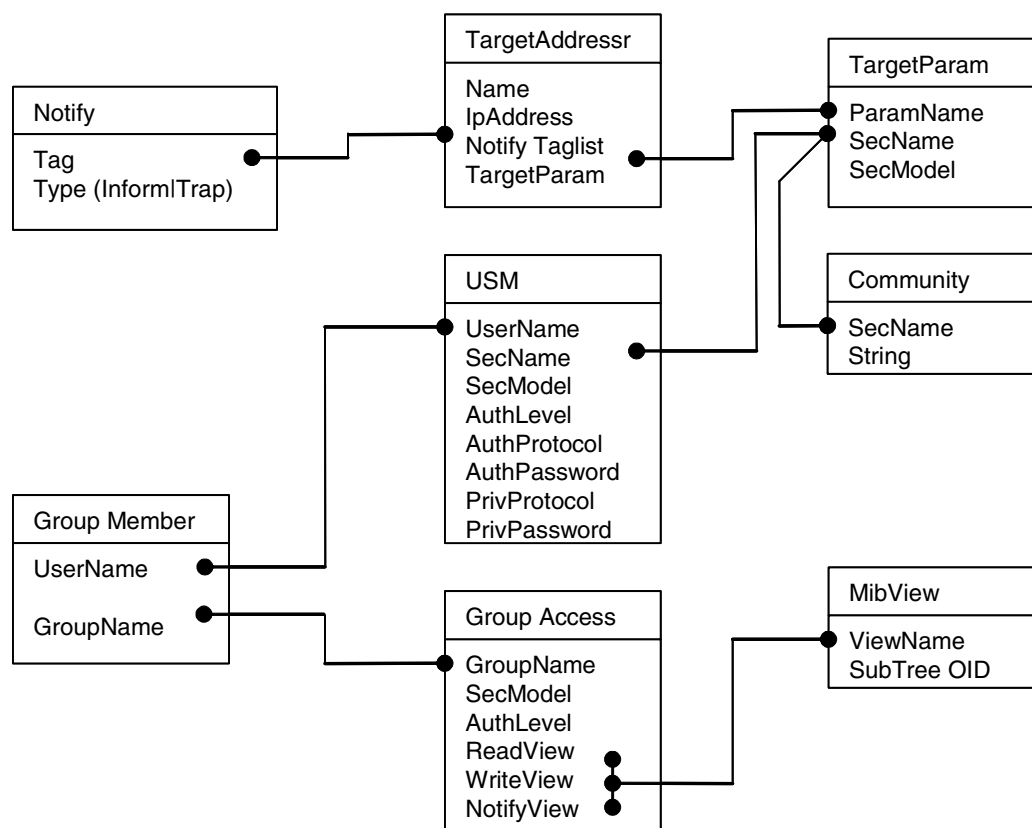
If the Triple DES (3DES) encryption module is not available then SSH can not be configured. Telnet will be the only available communications protocol for accessing the PP8600 command line.

### 1.3.3 SNMPv3 Tables

The following tables are used to configure SNMPv3 authentication and privacy.

- **USM** table defines users, authentication/privacy protocols, and passwords.
- **Group-Member** table defines which groups each USM user belongs to

- **Group-Access** table defines the access rights each user has to the objects in the MIB tree.
- **Notify** table defines the types of notifications (TRAP or INFORM) that are sent.
- **Target-Param** table defines which USM user will receive a notification.
- **Target-Address** table defines the network managers that receive notifications. Each row denotes a unique manager. It will have 1 or more references into the Notify table to determine which notification type. It will also have a 1 reference into Target-Param table to determine the user credentials used to send the notification.
- **Community Table** contains the Read and Write community strings for SNMPv1/v2c. Note that the Target-Param table references the Community Table for the purposes of sending v1/v2c traps.



### 1.3.4 Configure SNMP-v3

Change into the `snmp-v3` context by entering context name. The new prompt will display as,

```
PP8600:5/config/snmp-v3#
```

- 1 Add users `iems` and `jdm`. We create a different user for each application so that a password change made using the JDM will not break the IEMS application. SNMPv3-USM uses an authentication protocol and password and also a privacy protocol and password. Entering the command the command syntax is,

```
usm create <user> <auth_prot> auth <pw1> priv <pw2>
```

where `<auth_prot>` is one of: `sha` | `md5`

Enter the commands,

```
usm create iems sha auth iemspass1 priv iemspass2
```

```
usm create jdm sha auth jdmpass1 priv jdmpass2
```

will create the 2 users: `iems` and `jdm` with:

- authentication protocol of SHA-1 and authentication password of `iemspass1` and `jdmpass1`
- privacy password of `iemspass2` and `jdmpass2`. The privacy encryption protocol is DES. This is the only one supported by the PP8600.

The information above should be noted as it will be used to configure both the IEMS and JDM.

| Attribute               | Value                               |
|-------------------------|-------------------------------------|
| User Name               | <code>iems</code>                   |
| Authentication Protocol | <code>sha</code>                    |
| Authentication Password | <code>&lt;user specified&gt;</code> |
| Privacy Protocol        | DES (only allowed value on PP8600)  |
| Privacy Password        | <code>&lt;user specified&gt;</code> |

Enter the command, `usm info`, to display the current context. It should look like,

| User/Sec Name        | Engine Id              | Protocol              |
|----------------------|------------------------|-----------------------|
| <code>iems</code>    | 800008E00300E07BA7B400 | HMAC_SHA, DES PRIVACY |
| <code>initial</code> | 800008E00300E07BA7B400 | NO AUTH, NO PRIVACY   |
| <code>jdm</code>     | 800008E00300E07BA7B400 | HMAC_SHA, DES PRIVACY |



The user name `initial` is a pre-configured value for SNMPv1.

- 2 Add user `iems` to `vacm`. This will create a group `iemsgrp` and add the users `iems` and `jdm` to it.

The command syntax is,

```
group-member create <user_name> <model> <group_name>
```

where `<model>` is one of: `snmpv1` | `snmpv2c` | `usm`

Enter the commands,

```
group-member create iems usm iemsgrp
```

```
group-member create jdm usm iemsgrp
```

- 3 Now create an access control list for the `iemsgrp`.

The empty double quoted string is the context name. This is equivalent to a null context. It is not used and not supported by the PP8600.

The command syntax is,

```
group-access create <group_name> <prefix> <model>  
<level>
```

where:

`<model>` is one of: `snmpv1` | `snmpv2c` | `usm`

`<level>` is one of: `noAuthNoPriv` | `authNoPriv` | `authPriv`

Enter the command,

```
group-access create iemsgrp "" usm authPriv
```

Note that the `<prefix>` is saved as the context name but is not use in the current level of firmware.

- 4 Finally indicate the branches of the mib tree that `iemsgrp` is allowed to access.

The command syntax is,

```
group-access view <group_name> <prefix> <level> read  
<view_name> write <view_name> notify <view_name>
```

Enter the command,

```
group-access view iemsggrp " " usm authPriv read org
write org notify org
```

Values for <view\_name> can be see with the command,

```
mib-view info
```

These define which part of the mib tree can be accessed. The value `org` specifies every object under the prefix `.iso.org`.

- 5 Add/verify the available notification types. There should be two pre-configured types. These can not be altered or deleted and is sufficient for our needs. Enter the command, `notify info` and the Notify Table should display as,

| Notify Name | Tag       | Type   |
|-------------|-----------|--------|
| Inform      | informTag | inform |
| Trap        | trapTag   | trap   |

If this is not correct add the information via,

The command syntax is,

```
notify create <notify_name> tag <value> type <type>
```

where:

<type> is one of: trap | inform

Enter the commands,

```
notify create tag Inform informTag type inform
```

```
notify create tag Trap trapTag type trap
```

- 6 Add target address for traps. First we must add an entry into target-param,

The command syntax is,

```
target-param create <tparm_name> mp-model <value>
sec-level <value> sec-name <value>
```

where the value for:

mp-model is one of: snmpv1 | snmpv2c | usm

sec\_level is one of: noAuthNoPriv | authNoPriv |  
authPriv

sec-name is the usm user entered in step 1. --  
either iems or jdm

Enter the commands,

```
target-param create TparamV3iems mp-model usm sec-  
level authPriv sec-name iems
```

```
target-param create TparamV3jdm mp-model usm sec-  
level authPriv sec-name jdm
```

This will create a new row in the table with name TparmsV3iems referencing our iems user in the USM table. Enter the command, target-param info and the table should display as,

| Target Name  | MP Model | Security Name | Sec Level    |
|--------------|----------|---------------|--------------|
| TparamV1     | snmpv1   | readview      | noAuthNoPriv |
| TparamV2     | snmpv2c  | readview      | noAuthNoPriv |
| TparamV3iems | usm      | iems          | authPriv     |
| TparamV3jdm  | usm      | jdm           | authPriv     |

TparamV1 and TparamV2 are pre-configured default entries for SNMP v1 and v2c. They should not be deleted.

## 7 Add the ip-address of the IEMS that will receive our traps. Repeat for each IEMS.

The command syntax is,

```
target-add create <target_name> <ip_addr>  
<target_parm> taglist <value>
```

Enter the command,

```
target-addr create bumrot 47.142.94.68:162  
TparamV3iems taglist trapTag
```

...or...

```
target-addr create bumrot 47.142.94.68:162  
TparamV3jdm taglist trapTag
```

This will create an entry for,

- a host called `bumrot`. This is an arbitrary string and does not match the real host name. PP8600 will not use a DNS to resolve the ip-address.
- The ip-address to receive the trap.
- A reference to the user who receive the trap at the specified ip-address. This is designated via the target-param name of `TparamV3iems TparamV3jdm`.
- A reference to the kind of notification to be sent. This is designated via the notify name of `trapTag` and points back to the Notify Table we verified earlier.

Note that the `<ip_addr>` is the primary key in this table. A trap can be sent to only one user (one `target_param`) on the specified address, i.e., one can not issue both of the commands listed above. The second will elicit an error indicating a duplicate ip address.

If SNMP v1/v2c traps are being configured enter the command above but specify either `TparamV1` or `TparamV2` as the `<target_param>`. For example,

```
target-addr create bumrot 47.142.94.68:162 TparamV1
taglist      trapTag
```

### 1.3.5 Enable SSH

Enter the `config` sub-context. From the `config/snmp-v3` sub-context you can enter the context name, `config`, to jump to the correct context or enter a single period (.) to move up one context level. The new prompt will display as,

```
PP8600:5/config#
```

Enter the following command,

```
bootconfig flags sshd true
sys set ssh action dsa-keygen 1024
sys set ssh action rsa-keygen 1024
sys set ssh enable
```

### 1.3.6 Disable Non-secure Services

From the `config` sub-context, enter the following commands,

```
bootconfig flags ftpd      false
bootconfig flags tftpd     false
bootconfig flags rlogind   false
web-server disable
```

We also want to disable telnet but not just yet.

### 1.3.7 Verify SSH is working and Disable telnet

Log in using SSH and from the config sub-context enter,

```
bootconfig flags telnetd false
save bootconfig
```

### 1.3.8 1.2.1.8 Disable SNMPv1/v2c

Access via SNMPv1 and v2c is controlled using community strings. From the config/snmp-v3 context enter the command, community info, to display the current table. The pre-configured values for public and private community names are contained in the Security Names readview and initialview respectively. The column designated as, name, is the community name string and is shown as a list of asterisks. The pre-configured values are “public” and “private”.

| Index  | Name  | Security Name | Transport Tag |
|--------|-------|---------------|---------------|
| -----  |       |               |               |
| first  | ***** | readview      |               |
| second | ***** | initialview   |               |

The PP8600 does not allow pre-configured values to be deleted in most tables. It does not allow either row shown above to be deleted. It does, however, allow the Name field to be changed. We can change the public community string to some real long value, but the PP8600 would be subject to brute force attacks as the community name string is part of the SNMP PDU.

Alternatively, if we alter the Security Name field we can effectively disable SNMPv1/v2c. The Security Name field is used to access the GroupMember table to determine authority to access various elements of the MIB tree. To change the sec-name enter the commands,

```
snmp-v3 community secname first new-secname was
readview
snmp-v3 community secname second new-secname
was_initialview
```

Now all v1/v2c get and set requests will fail VACM access checks due an inability to find the Security Name in the GroupMember table. The PP8600 is not subject to brute force attacks as the Security Name is not included in the SNMP PDU.

### 1.3.9 Change default SNMPv1 community strings

The read and write community name strings of `public` and `private` are trivial and well known and must be changed. From the `config/snmp-v3` context enter the command, `community info`, to display the current table. The pre-configured values for `public` and `private` community names are contained in the Security Names `readview` and `initialview` respectively. The column designated as, `name`, is the community name string and is shown as a list of asterisks.

| Index  | Name  | Security Name | Transport Tag |
|--------|-------|---------------|---------------|
| -----  | ----- | -----         | -----         |
| first  | ***** | readview      |               |
| second | ***** | initialview   |               |

To change community strings enter the commands,

```
community commname first new-commname <publicvalue>
community commname second new-commname <privatevalue>
```

### 1.3.10 Change the login passwords

Passwords are changed via the configuration context,

```
cli password
```

It is recommended that the passwords for the `rwa` and `rw`, at a minimum, be changed. Enter the commands and follow the prompts.

```
cli password rw rw
cli password rwa rwa
```

### 1.3.11 Save the configuration

Enter the following commands,

```
save bootconfig
save config
```

## 1.4 Configure JDM

Start the JDM. The following dialog will appear. Enter a host name or IP-Address in the “Device Name” field and select the “v3 Enabled” checkbox. The Read and Write Community names are not used with SNMPv3. Fill in all SNMPv3 fields using the same information used to create the SNMPv3-USM user in step 1 of Configure SNMP-v3.

This includes:

UserName: jdm  
Authentication Protocol: SHA-96  
Authentication Password: jdmpass1  
Privacy Protocol: DES  
Privacy Password: jdmpass2



Depress the “Open” key and the device should be displayed.

## 1.5 Configure IEMS Manage Object

Start the IEMS client. Create a Network Element manage object. This is a 3 page dialog. Fill in the first page with IP Address, a Type of NE, the PP8600 Device Type and Device Version.

Host Name / IP Address: 47.142.126.223

Time Zone: America/New\_York

Display Name: PP8600

Type: NE

Device Type: PP8600

Device Version: 7.0

Buttons: Back, Next, Help, Cancel

Green bar: Add

Status bar: Java Application Window

Press the “Next” button to move to page 2 and fill in the information for receiving faults. Specify the SNMP version as “v3” from the combo box and enter the V3 Security Details using the same information used to create the SNMPv3-USM user in step 1 of Configure SNMP-v3. The Security Level should be specified as “AuthPriv”. The Context name field is not used by the PP8600 and can be left blank.



The screenshot shows a Java Application Window titled "Add EMS,NE". The window contains two main sections: "SNMP Details" and "V3 Security Details".

**SNMP Details:**

- Port: 161
- Community: (empty field)
- Version: v3 (dropdown menu)

**V3 Security Details:**

- Security Level: AuthPriv (dropdown menu)
- User name: iems
- Context name: (empty field)
- Auth Protocol: SHA (dropdown menu)
- Auth Password: (masked with asterisks)
- Privacy Protocol: CBC-DES
- Privacy Password: (masked with asterisks)

At the bottom of the window, there are four buttons: "Back", "Next", "Help", and "Cancel". Below these buttons is a green bar with the "Add" button. The status bar at the bottom indicates "Java Application Window".

Press the “Next” button to move to page 3 and fill in the information for receiving performance data. Specify the SNMP version as “v3” from the combo box and enter the V3 Security Details using the same information used to create the SNMPv3-USM user in step 1 of Configure SNMP-v3. The Security Level should be specified as “AuthPriv”. The Context name field is not used by the PP8600 and can be left blank.

Performance Interface

SNMP Details

Port: 161

Community:

Version: v3

V3 Security Details

Security Level: AuthPriv

User name: iems Context name: x

Auth Protocol: SHA Auth Password: \*\*\*\*\*

Privacy Protocol: CBC-DES Privacy Password: \*\*\*\*\*

Back Finish Help Cancel

Add

Java Application Window

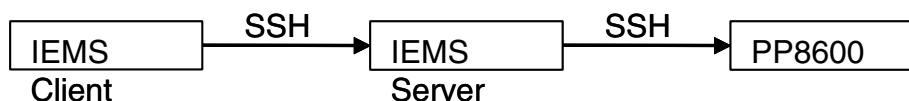
Press the “Finish” button to complete the creation. IEMS will discover the device and update the map.

## 1.6 Configure IEMS Command Line Launch to PP8600

The PP8600 configuration console we used, via telnet, in Configure SNMP-v3, can be accessed via the IEMS Map.

In SN07 the IEMS Client creates an SSH session with the IEMS Server. The IEMS Server acts as proxy and forwards the connection, using telnet, to the PP8600.

In SN08 the PP8600 will enable the SSH protocol and disable the telnet protocol. The second connection from IEMS Server to PP8600 will change from telnet to SSH.



The first time a client using an SSH application (such as MindTerm) connects to another host, that host will send a public key to the client. The client will be asked if they would like to accept the key. The message may alternatively ask if this host should be added to the set of known hosts on the client machine. Failure to respond affirmatively will cancel the connection.

Because there are two SSH connections it is possible that two prompts will be displayed -- one for each SSH session. This will occur anytime the server changes the public/private keypair; which is seldom. Note that the public key from the IEMS Server will be saved onto the client's machine. The public key from the PP8600 will be saved onto the IEMS Server in the file

## 1.7 Hardware Requirements or Dependencies

None

## 1.8 Software Requirements or Dependencies

- 1 The Passport 8600 must be running v3.7 of the microcode and both the DES and 3DES encryption modules (p80c3700.des, p80c3700.img) should be present in flash.
- 2 The JDM should be version 5.8 or later.

## 1.9 Limitations

None

## 1.10 Interactions

None

## 1.11 References

- Important Security Information for the 8000 Series Switch
- Passport 8600 Software Release 3.7 – Configuring Network Management
- Passport 8600 Software Release 3.7 – Configuring and Managing Security
- Configuring SNMPv3 on the Passport 8600 (version 1.0 - April 2003)
- <http://www142.nortelnetworks.com/bvdoc/setips/july03/csx8600snmpv3con.pdf>
- Nortel web site <http://worcester.us.nortel.com/Products/p8600/>
- “SNMP, SNMPv2, SNMPv3, and RMON 1 and 2”, 3rd Edition by William Stallings
- Security Features of SNMPv3
- <http://www.simple-times.org/pub/simple-times/issues/5-1.html#operations>

## 1.12 Glossary

| Term   | Description                        |
|--------|------------------------------------|
| 3DES   | Triple DES                         |
| DES    | Data Encryption Standard           |
| JDM    | Java Device Manager                |
| MAC    | Message Authentication Code        |
| MD5    | Message Digest (version 5)         |
| PP8600 | Passport 8600 Routing Switch       |
| SHA-1  | Secure Hash Algorithm (version 1)  |
| SNMP   | Simple Network Management Protocol |
| SSH    | Secure Shell                       |
| USM    | User-based Security Model          |
| VACM   | View-based Access Control Model    |

## *Product = IEMS*

### **A00006759--Secure Launch of MDM X11 Client Application** *Functional Description*

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Introduction**

MDM Client applications which are available in MDM Server can be launched in local machine via X11 protocol. This mean of communication needs to be secured via SSHTunneling/Port Forwarding. This document explains the functional details of X11 Port Forwarding for MDM in IEMS.

#### **1.3 X11 Port Forwarding**

Application from remote server will communicate to X11 server running on local client machine via SSH Tunnel which has already been established between the client and the server. The ssh server, running on the remote server machine forwards display of X clients to the ssh client, running on local client

machine. The ssh client will inturn forwards the display content to the X server on local client machine.

## 1.4 X11 Port Forwarding For MDM

The X11 Port forwarding for MDM Client application is achieved using MindTerm tool. The MindTerm tool provides a secure session with x11 port forwarding parameter as true. This will enable a secure X11 communication for MDM Client Application/MDM Gui Launches.

The X11 Port forwarding requires Xserver needs to be run in the local client machine. In the case of solaris/linux, Xserver runs by default and in the case of Windows, Hummingbird's Exceed is used as Xserver.

The steps to launch a MDM Client Application involves,

- 1 Click on MDM ManagedObject's MenuItem - "MDM Mgr GUI", which will launch a "NortelMDMGUILauncher" dialog.
- 2 Now in the dialog, XServer's(Exceed) path has to be provided in the case of Windows OS Only.
- 3 The MDM Centralized Account - username/password will be automatically filled and these fields will not be editable.  
(Use "ChangeMDMCentralizedAccount" - Managed Object menu item to change the same.)
- 4 MDM Client application( say *nmstool* ) which needs to be launched, has to be provided in Command field.
- 5 Now clicking on "Execute" button will execute Exceed ( in the case of Windows) followed by launching the MDM Client Application.

Please refer [usecase](#) to see with snapshots.

The actual mechanism involves is that, Mindterm creates a ssh client by establishing a ssh tunnel with the ssh server running in MDM Manager Device. It provides a secure *ssh session* with DISPLAY variable set, where in the MDM Client Application is launched.

After successful execution, the mentioned MDM Client Application (say *nmstool*) is only visible. Exiting MDM Application will terminate both the application and the ssh session with MDM Manager Device.

For unsuccessful execution of invalid client application ( given in Command field), the ssh session will be simply terminated.

## 1.5 Testing Considerations

- 1 Launching MDM Client Application in Linux, Windows and Solaris systems.
- 2 Test the launch functionality after changing the MDM Manager settings like Client-Server IP Provisioning, MDM Centralized Account etc.
- 3 Usability Testings- NortelMDMGUILauncher dialog

## 1.6 UseCase

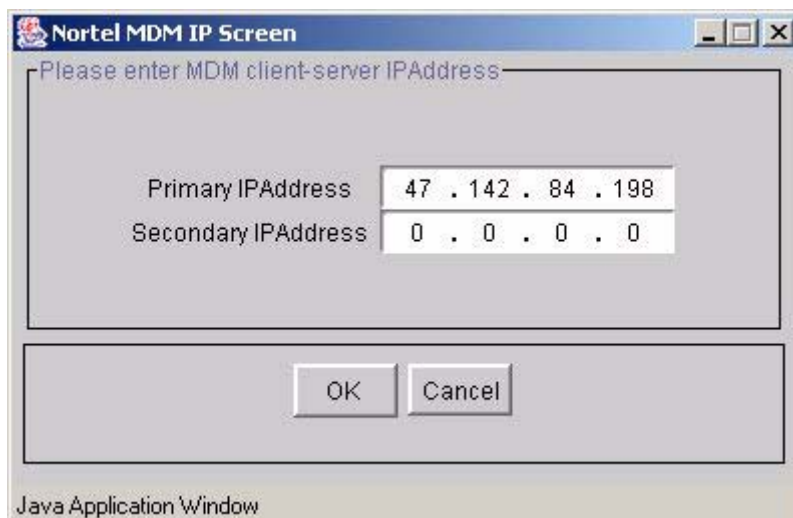
The procedure to provision the client server ipaddress and launch the MDM Manager are as follows:

### 1.6.1 Provisioning client-server IP address for MDM Manager

To provision a client-server IP address for MDM object in Integrated EMS, follow these steps:

*At Integrated EMS workstation*

- Launch the Integrated EMS Java Web Start Client
- Select the **Element Managers** topology node in the Integrated EMS tree.
- Select the required **MDM** map symbol in the Integrated EMS display panel.
- Right-click the map symbol and select the **Client-Server IP provisioning** menu item. The system displays a window similar to the following figure.



- Enter the MDM Client-Server primary IP address in the **Primary IP Address** field. The primary ipaddress is that which is configured during adding the MDM device in the “simplex” mode in the Integrated EMS.
- Enter the MDM Client-Server secondary IP address in the **Secondary IP Address** field. The secondary ipaddress is configured when adding a MDM device in the “duplex” mode in the Integrated EMS.
- Click the **OK** button.

*Note:* The above steps must be carried out only once.

### 1.6.2 Launching MDM Manager for MDM

To launch MDM Manager GUI for MDM, follow these steps:

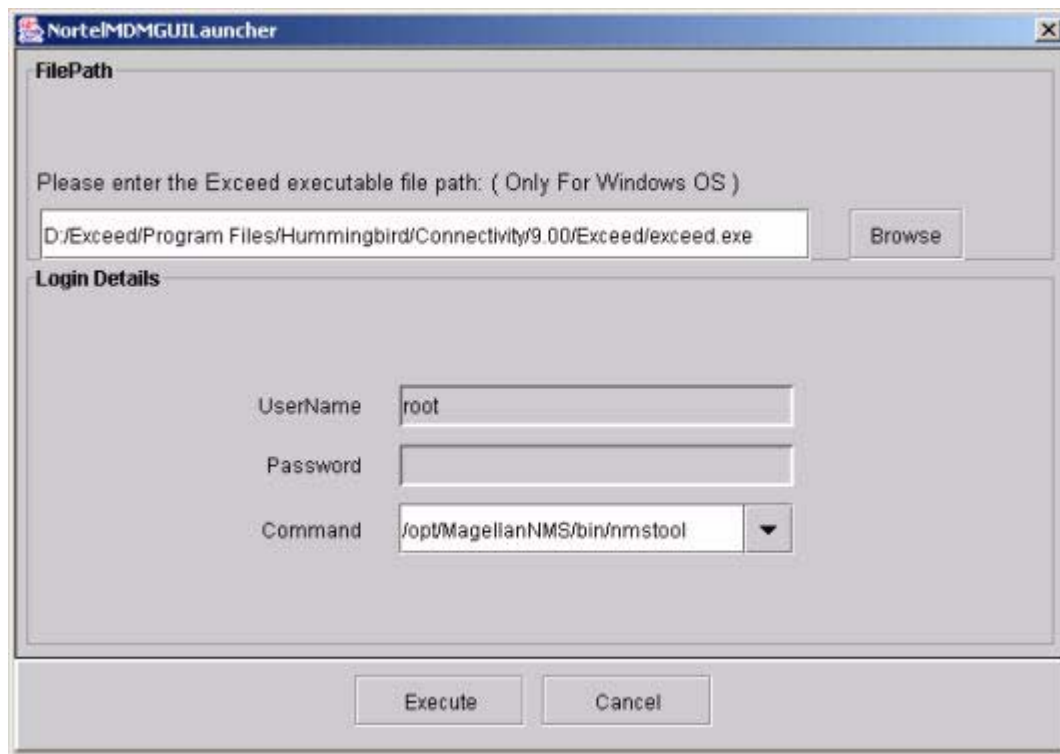
*At Integrated EMS workstation*

- Launch the Integrated EMS Java Web Start Client
- Navigate to the **Element Managers** topology in the Integrated EMS tree.
- Select a **MDM** map symbol.
- Right-click the map symbol and select the **MDM Mgr GUI** menu item. The Client Server List window is launched as shown below.



- Select the IP address of the device from where the MDM manager is to be launched, from the list box.

Click the **OK** button. The system displays a window similar to the following figure.



- Click the **Browse** button to select Exceed executable file path.
- For the MDM Centralized Account the username and password are automatically filled and these fields are not editable.
- Type the command “/opt/MagellanNMS/bin/nmstool” in the **Command** editable list box.
- Click the **Execute** button to execute the specified command. This launches the nmstool application as the one shown below.









# SN08 Feature Deltas

***Product = IEMS***

## **A00007302--SN08 IEMS - CEM Integration**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

#### **1.2 Description**

This feature integrates the functionality of CEM (Core Element Manager) to the IEMS (Integrated Element Management System).

CEM includes the Resource Discovery (RD), Fault Management (FM) and Performance Management (PM) support for wireline succession core (call server). Adding, deleting and managing CEM will be possible from IEMS.

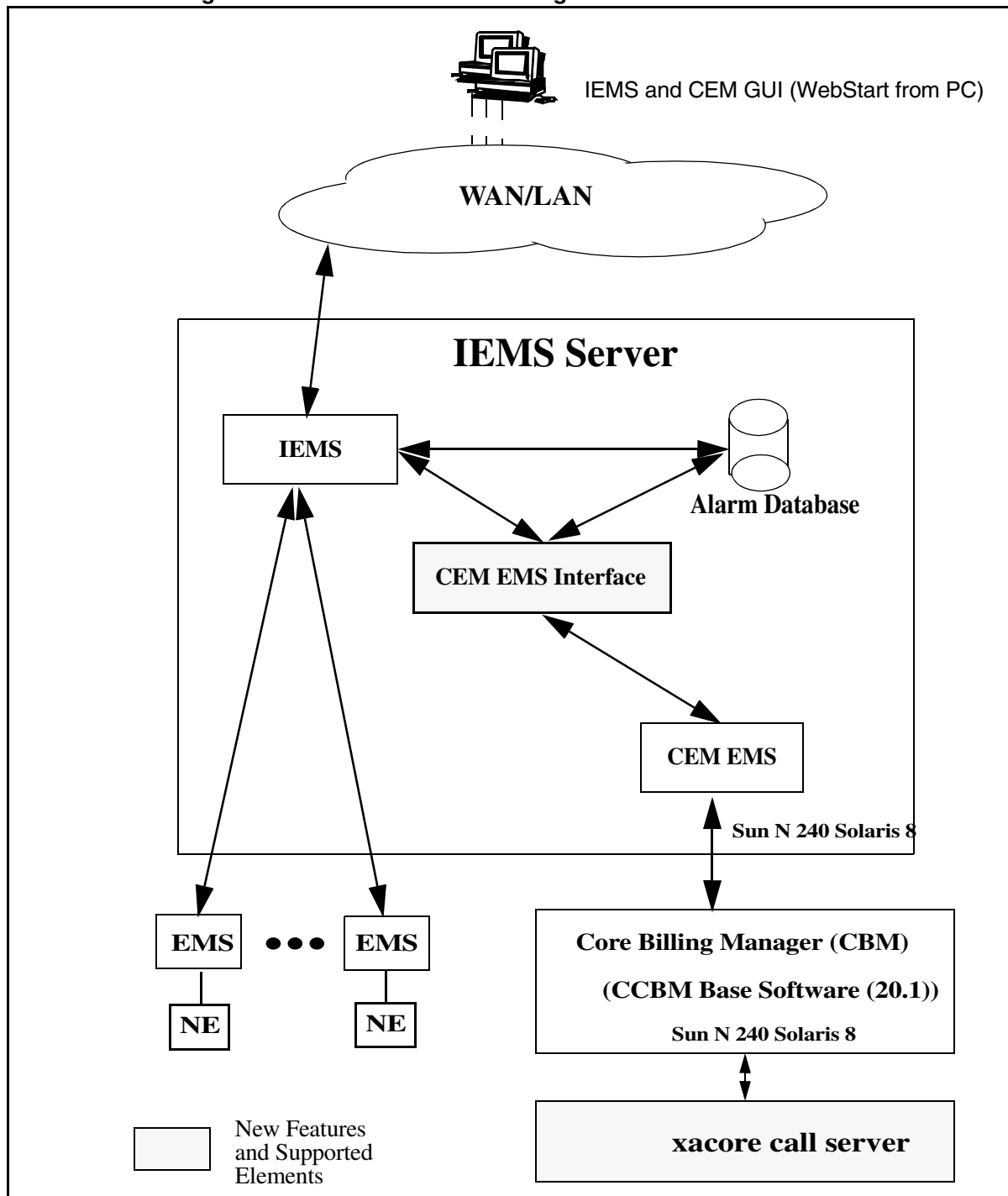
IEMS is comprehensive OAM&P solution with aggregated OSS interfaces, central browser and launching point and with unified security management.

The Core Element Manager system is the Nortel implementation of a Element Management System which provides

- An interconnection between the specific management applications that are on workstations and operated by systems personnel, over a Local Area Network/Wide Area Network (LAN/WAN) using Transmission Control Protocol/Internet Protocol (TCP/IP).
- An exchange of management information (data) between the management applications and the various elements of the Core Network elements. In the Circuit Core Network, the management application is the Core Element Manager, installed on a PC or Sun platform.
- Mediation functionality (data accumulation, filtering, manipulation, and transfer) between the network elements and the Core Element Manager workstation.

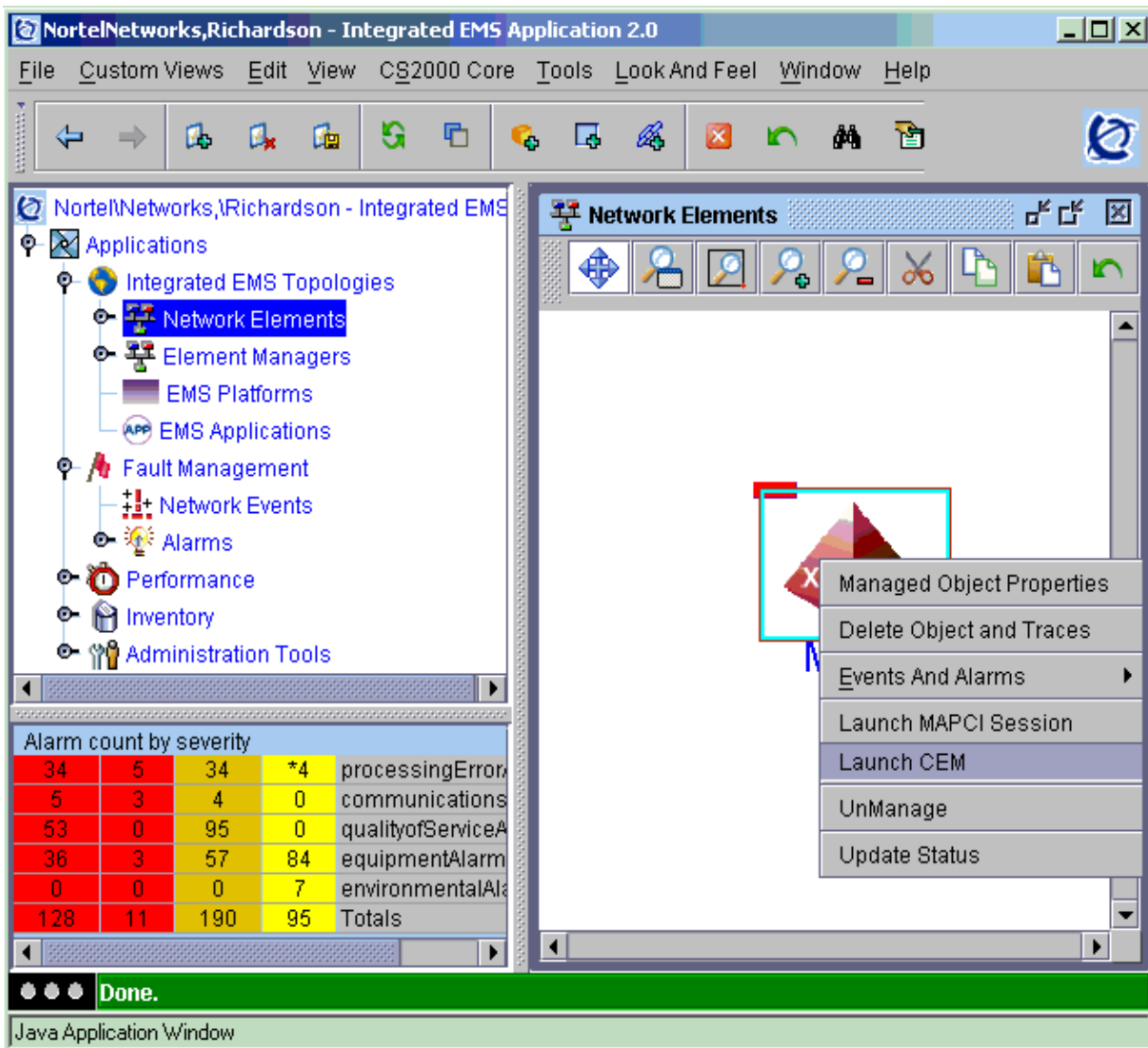
An overview for the integration of IEMS to CEM is shown in Figure 1 below:

**Figure 1 Functional Behavior Diagram**



### 1.2.1 Launching CEM From IEMS.

Launch the CEM Browser by selecting the NE from the “Element Manager” subtree in the left panel. Upon the right click on the NE icon, a menu list is invoked where “Launch CEM” can be selected to invoke the CEM Browser.



### 1.2.2 CEM components

The CEM software includes the Core Element Manager GUI, CEM Server, and OMC-S in CBM.

- Core Element Manager Browser: The GUI works on a PC or SUN Platform as a facilitator interaction between operations, administration, maintenance, and provisioning (OAM&P) personnel and the network elements.

- Core Element Manager (CEM) Server runs in a solaris box. The CEM server does back end work for performance management, fault management, configuration management and security management. Only one instance of CEM server software can run with a single IEMS.
- CBM is the mediation device which connects to the network element and get raw data such as OMs, logs and also the table data and pass this information to the cem server software.

These three components together performs the performance management, configuration management, fault management and security management functionality of an element management system.

### **Fault Management**

The Fault Management (FM) function displays logs of alarm or fault events that occur within the network usually within a switch node. These alarms or events may have an impact on the overall service of the network element. To aid you in correcting any problems with a network element, the Fault Management function gives you information about the element so you can perform further maintenance operations. To help manage the alarms or events that occur within the network, Fault Management provides the following capabilities:

- displays alarms for a specific switch node. When a repeated alarm occurs for the same problem and the same resource, the most current alarm is shown. The previous alarms are kept as cleared alarms.
- displays a time-based histogram of alarm activity for time periods of 1 to 30 day. By default, the retention period is 30 days for uncleared alarms and 7 days for cleared alarms.
- displays alarms by alarm type (active, cleared, manual, and/or cleared manual alarms)
- displays alarms by selected severities (Critical, Major, Minor, Warning, unknown, or any combination)
- displays the element color to reflect the current alarm status
- displays alarms for specific filters, and causes specific actions to happen
- provides alarm notifications as they occur within the underlying resources
- exports alarm data to file
- prints alarm data

- provides filter criteria for alarms
- provides online help for alarms
- provides actions triggered by alarms

### **Configuration Management**

The Configuration Management function allows you to manage network elements (call server) within a circuit core network. The Configuration Management identifies the configuration and status of the network when it is initialized. The network elements are identified by icons and are arranged according to the network hierarchy. The Element Manager displays complete information for each target network element and its subordinate elements. The configuration display is updated automatically by the Configuration Manager maintaining consistency between the Element Manager display and its managed objects. This display is called containment tree.

The Configuration Manager includes the following features:

- Physical, Logical, icon, or List views from the Element Manager
- Pin and Unpin nodes
- nodes sorted by name or severity
- find carriers and linksets
- saving and retrieving of notes for nodes
- table access (add/read/delete/modify tuple operations)
- customs wizards to create/modify/delete trunks and other table access operations
- integration with performance management
- launch the Threshold Management window for a PM resource
- threshold management information in the info window for PM resources (last Value: Critical, Major, Minor)
- threshold crossed information in the info bubble
- Performance Management information in the info window for PM resources (pmCurrentData)
- Print support for CM window.

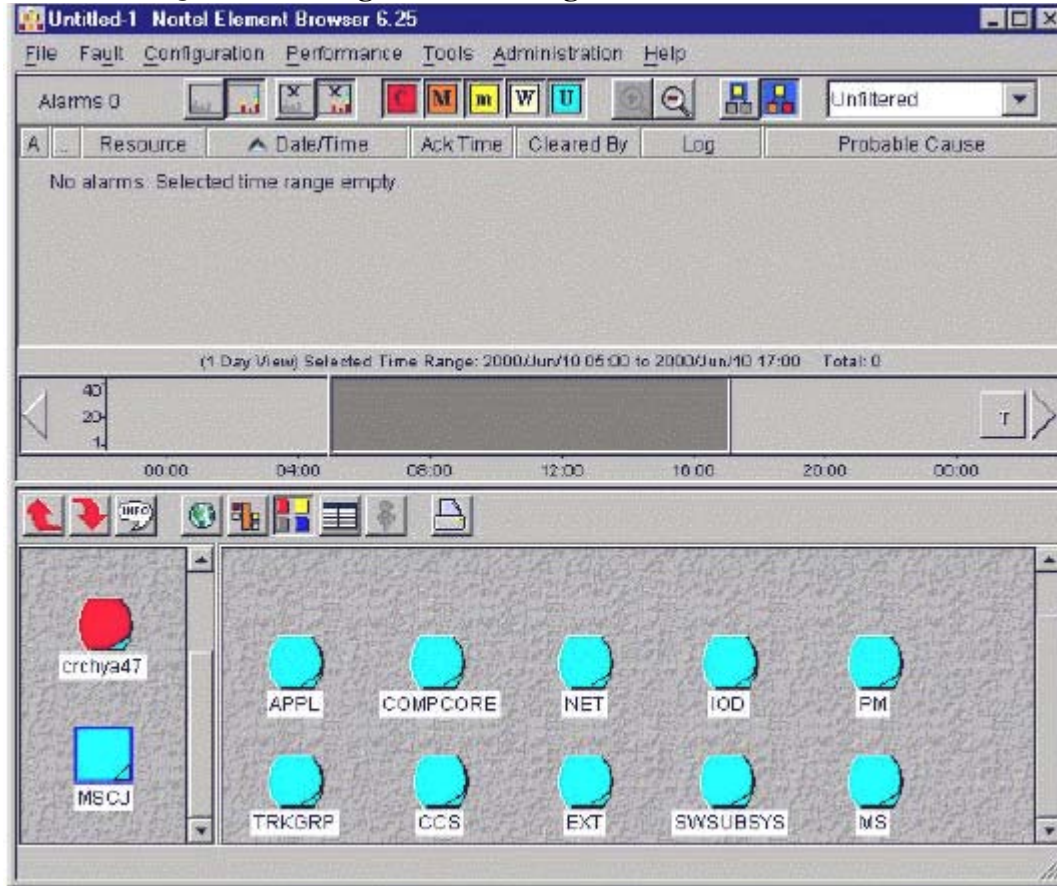
**Figure 2 Configuration Management Window in Icon view**



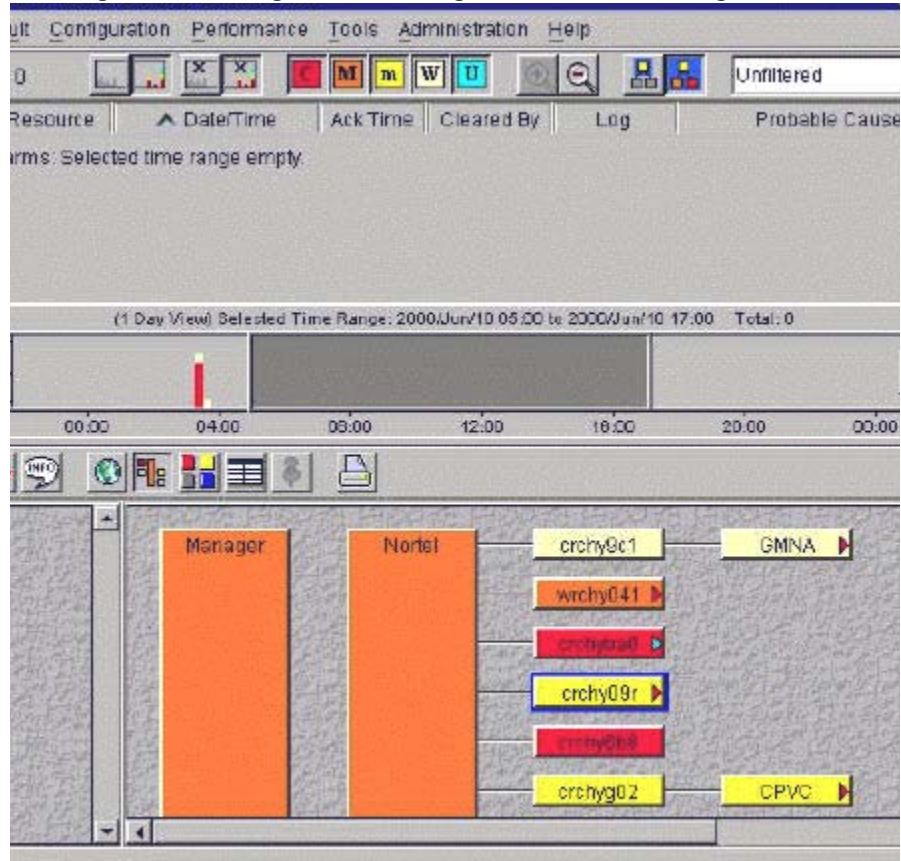
**Figure 3 Configuration Management window in logical mode**

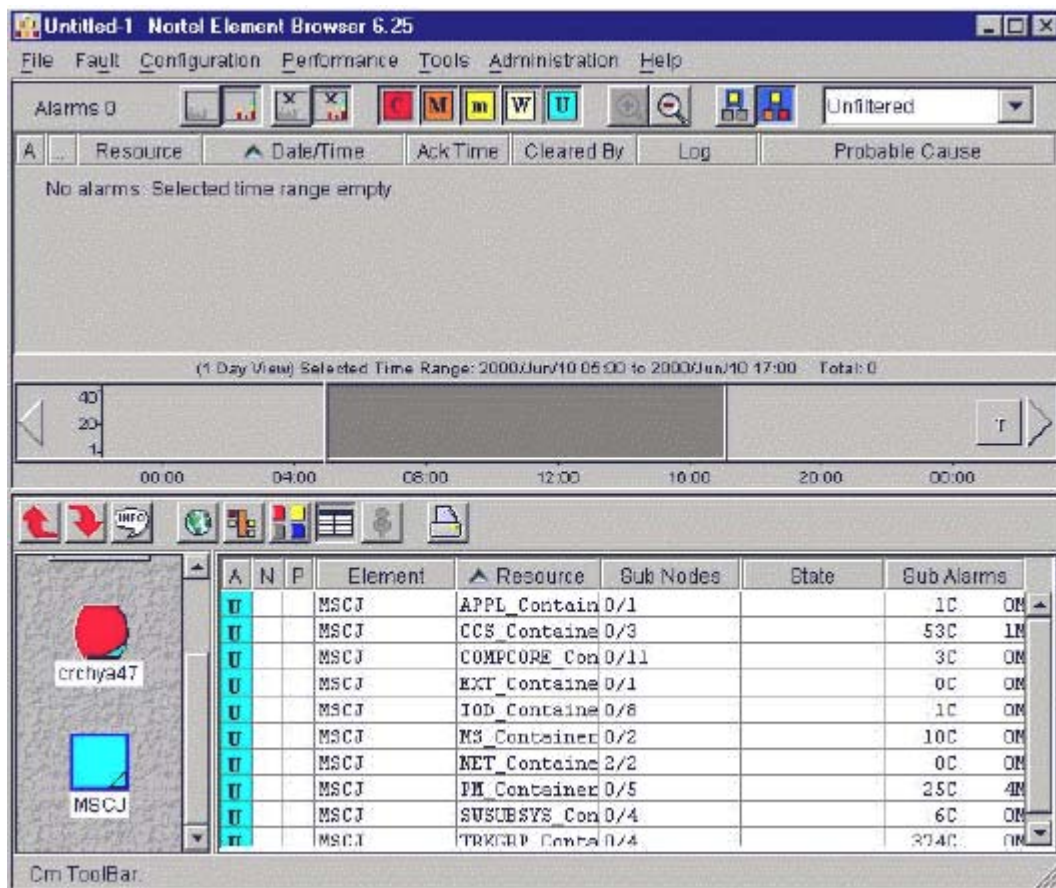
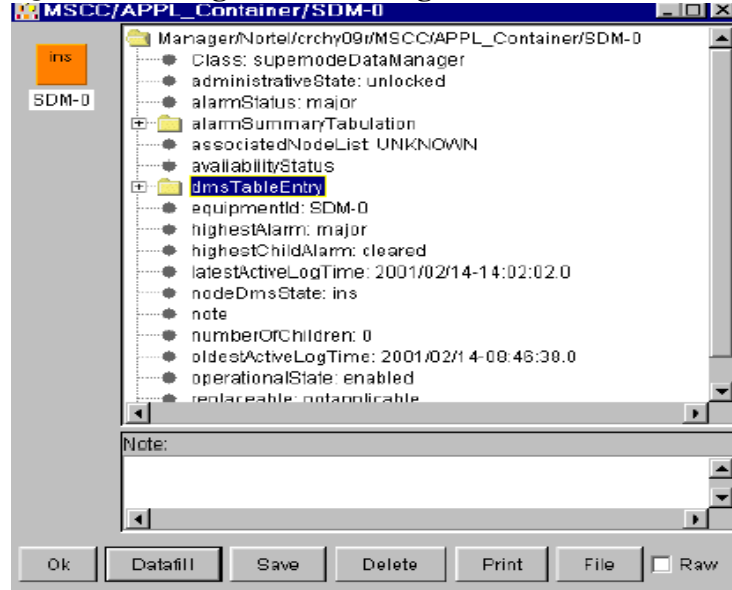
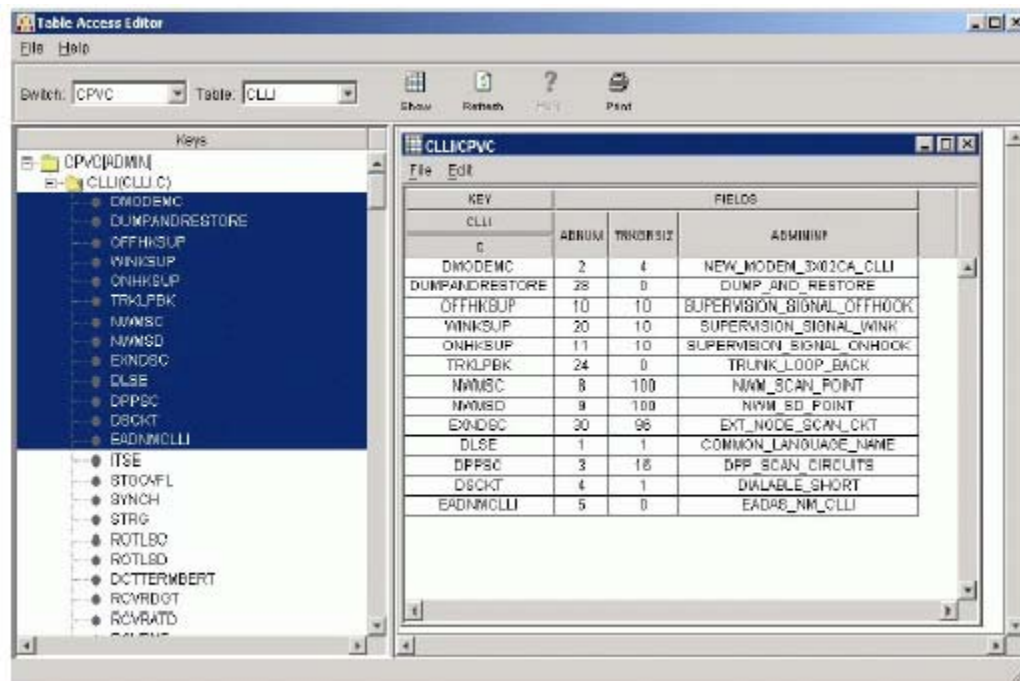
**Figure 4 Configuration Management Window in List view**

**Figure 5 Configuration Management: Info Window****Figure 6 Table Access Editor**

## Performance Management

The Operational Measurements (OM) system provides the operating company with the following measurements for the Circuit Core Networks (CCN) Call Server:

- switch performance measurements
- traffic measurements
- service data

You can view OM records to ensure that the CS switch operates at its fullest potential with optimum efficiency. New OM data is transferred from the switch every transfer period, such as every 15 or 30 minutes.

The Performance Management (PM) functionality does the following:

- Provides access to OMs in predefined measurement groups
- Displays OMs in operator-configurable studies, including a graph of specific OMs over a given timeframe
- Configures real-time updates of OMs with the CS transfer period as the minimum update frequency
- Allows exports and mass exports of OMs to files in two formats, the original switch text format, or a tab-delimited format for use by third-party applications such as spreadsheets or graphing utilities
- Displays data from multiple network elements on the same graph
- Displays errors, such as incomplete OM data for the requested study
- Sends the output display to printer
- Allows OM threshold settings
- Displays summary reports on a network elements

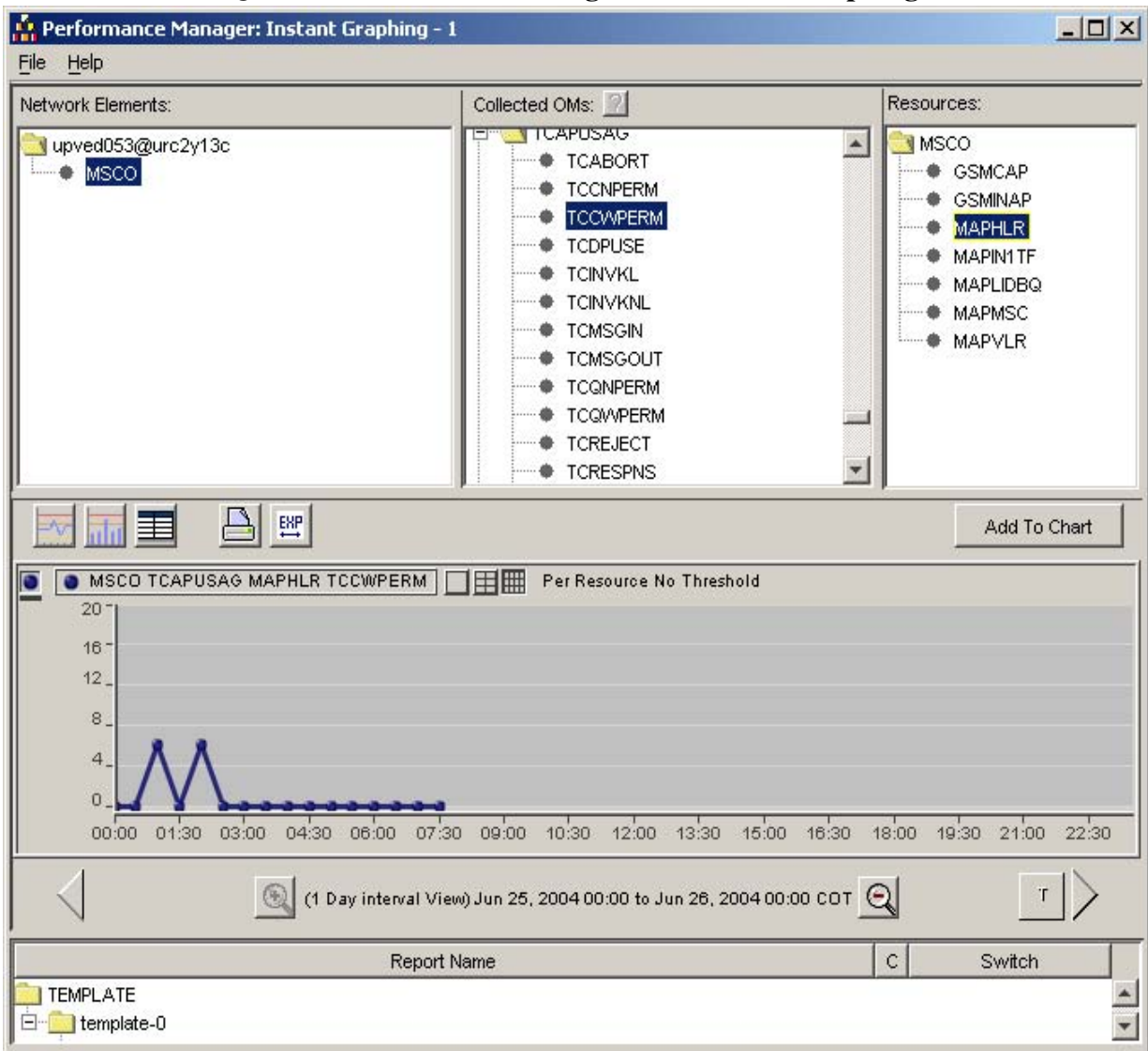
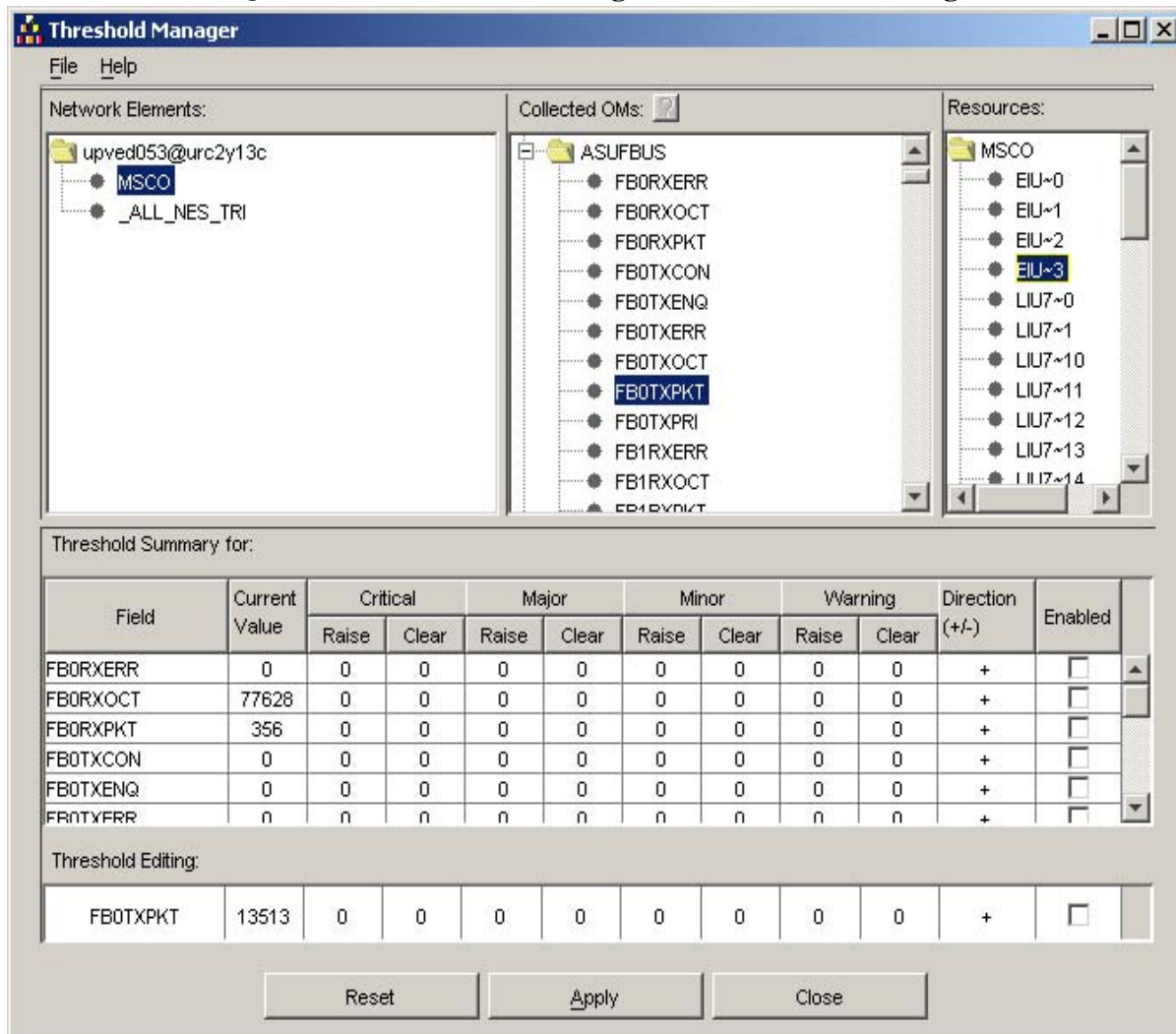
**Figure 7 Performance Management: Instant Graphing Window**



**Figure 8 Performance Management:Threshold Manager Window**

### Security Management

It is necessary to restrict access to the CEM browser to only users with valid login credentials. The security framework on the CEM system is provisioned with the functionality like login to access the CEM browser, encrypted login credentials, account lockout due to consecutive failed login attempts, change password capability, configuration of the Telnet or FTP session, timeout interval periods, generate Security Alarms and Event Logs (Journal File).

### 1.2.3 Launching CEM from IEMS

The integration of CEM into IEMS will enhance the capabilities of IEMS to manage the cs2k node through the CEM. Alarms from cs2k are stored in the IEMS alarm database and displayed in the existing alarm panel in the IEMS GUI.

### 1.2.4 Discovery of new resources

The resource discovery is implemented by extracting call server switch configuration data via the dmsDataServer. The status of resources are discovered through remote procedure calls (RPC's) on the core from rpcServer process on CBM. This feature ensures that all the tables representing the call server switch resources are discovered. The Table Access function in the CEM Browser supports all the tables residing in the call server switch.

The new RPC's will discover following resources:

- GWC (packetized lines and trunks)
- MG4K (packetized AAL1 trunks)
- IWSPM (hybrid interworking)
- LTC, LGC, SMA (legacy lines peripheral)
- LCD type nodes (legacy lines) – LCM, RDT, RCC
- ABI (packetized legacy lines)
- DPT (virtual trunks, BICC and SIP-T)

### 1.2.5 Support for New OM's

For the PM functionality, accumulation for all the call server OM's are supported. Pre-canned studies for the current DMS-MSC OM's that are common to the call server are also supported. OM groups can be selected and exported in tab delimited format or switch format which is exactly the way they appear in the core. Also OM group studies (graphical and text) are possible from the CEM GUI for the past OM reports. The extension OM groups and OM registers will be combined with base groups and registers. Please refer to the Appendix B for the OM's supported in this feature. These will be available through the interfaces provided by CEM. The existing performance subsystem in IEMS does not change.

### 1.2.6 Mapping of new logs

Alarms from the core will be mapped to their respective components in the containment tree. Please refer to the Appendix A of this feature for the logs supported in this feature.

## 1.2.7 Single authentication for IEMS and CEM

User will be required to enter the user's name and password as the IEMS login window. The userid will then be passed down to CEM.

### 1.2.7.1 Password Management and User Access Control

All password management and user access control will be done through Succession's central security admin system. CEM will be using the SSPFS user defined groups for user access control.

## 1.2.8 Configuration Tools

By default CEM Server supports logs for which there is a mapping defined but An configuration script/tool can be used to configure other logs (for which there is no mapping) coming from succession core.

Using this tool any logs that are coming from succession core can be unblocked and passed through to CEM Server. Such logs that are by default blocked, but later unblocked, get mapped into default containers in the CEM containment tree.

### 1.2.8.1 Addrep/Delrep Tool

A tool called llClient (log list client) on the CEM Server could be used to addrep or delrep the logs coming from the core. The tool provides the below listed functionalities -

- addrep - to pass through a log coming from core so that CEM will be able to receive the log
- delrep - to block a log coming from core so that the log will not be received by CEM
- addrep all - to pass through all logs coming from core so that CEM can receive all of them

#### Usage:

1. On the CEM Server, login as user nortel or root and change directory to /opt/nortel/exe/coreEMS/GEM18/llClient/dat/.
2. Edit the SDM\_HOST parameter value and give the hostname of the SDM/CBM, slicename or the IP Address of the SDM/CBM the server is connected to.
3. Change directory to /opt/nortel/exe/coreEMS/GEM18/llClient/bin/.
4. Issue command: ./logListClient.start <operation> <logType> <logNumber>, where, operation is addrep or delrep, logType is the log name to addrep or delrep and logNumber is the number of the log to addrep or delrep.



[Note: Use “NIL” as logNumber to addrep or delrep all logs of a type.]

5. To make the addrep of the log function, the logNormalizer process must be busy/rts'ed using command line tool applman (Application Manager) on the CEM Sun Server. This tool is used to stop and start the CEM related processes running on the CEM Sun Server. Follow steps below for doing the same -

- a) On the CEM Server, change the directory to  
/opt/nortel/data/coreEMS/nodes/server/bin
- b) Issue the command ./applman -c
- c) Issue command down OMC-S
- d) Issue command down <slicename>
- e) Issue command busy logNormalizer
- f) Issue command rts logNormalizer
- g) Issue command exit to exit from applman
- h) Issue command help to know all the available options in applman

5. Use “all” to addrep all logs. Usage - ./logListClient.start addrep all.  
To restore to the previous configuration, follow steps below -

- a) Login to the SDM/CBM as root.
- b) Change directory to /sdm/configdata/lsv in case of SDM or  
/cbmdata/configdata/00/lsv in case of CBM.
- c) Issue command: cp cmlogs.config.old cmlogs.config
- d) Busy and Rts the logDelivery process using sdmmtc on the SDM or  
using cbmmtc on the CBM.

## 1.2.9 CEM Processes for handling OM's and Logs

### 1.2.9.1 Data Server process

The dmsDataServer process runs on the Core Billing Manager (CBM) platform, connects to call server node and receives both the Performance and Configuration data through Base APIs (Table Access Service and OM Access Service). Depending on whether its operational measurements (OM) or configuration data, it forwards it to performance manager or configuration manager respectively.

The following warning/error/information messages are generated in cutlog to reflect various problems. These messages can be seen in /var/adm/custlog file to find exact cause and fix.

1. Desc Msg: Could not read switch name

Fix Msg: Check state of switch

2. Desc Msg: Could not create tuple

Fix Msg: Check state of switch

3. Desc Msg: Could not read VRINV table

Fix Msg: Check state of switch

4. Desc Msg: Could not initialize OM Access

Fix Msg: Contact system administrator

5. Desc Msg: Could not initialize OM Access

Fix Msg: Contact system administrator

6. Desc Msg: Could not get keyinfo object, excluding group , <group>

Fix Msg: Check OM group for bad key/info type

7. Desc Msg: Could not get key, excluding group , <group>

Fix Msg: Check OM group for bad key type

8. Desc Msg: Could not get info, excluding group , <group>

Fix Msg: Check OM group for bad info type

9. Desc Msg: Could not register initialization timer

Fix Msg: Contact administrator

10. Desc Msg: Rejecting register request for excluded group: <group>

Fix Msg: Check group key/info for validity

11. Desc Msg: "Could not open listening connection

Fix Msg: Check /etc/services

12. Desc Msg: Could not open listening connection: <service name>

Fix Msg: Check services file

### 1.2.9.2 NLClient and NLServer

The operational measurements (OM) are available on the CEM server for graphing, dashboard, thresholding, mass export and correlation. The CEM server gets all the performance data from CBM through NLServer and nlSafServer processes running on CBM platform. The nlClient process running on the IEMS server receives OM data from nlSafServer and NLServer, process it and forward it to the upstream processes. All these processes makes the handling of OM data easier and faster. It offloads the load on CEM server in processing OM data.

The nlClient process will generate the following warning/error/information messages in cutlog to reflect various problems. These messages can be seen in /op/nortel/logs/coreEMS/custlog file to find exact cause and fix.

1. Desc Msg: Failed to Read NLClient listenconfiguration

Fix Msg: update the NLClient.cfg file

2. Desc Msg: Failed to Read NLServer Service configuration

Fix Msg: update the NLClient.cfg file

3. Desc Msg: Failed to Read ConfigBroker Service configuration

Fix Msg: update the NLClient.cfg file

4. Desc Msg: Failed to Read SafServer Service configuration

Fix Msg: update the NLClient.cfg file

5. Desc Msg: Failed to read NLClient config file

Fix Msg: Contact next level of support

6. Desc Msg: Failed to register synchronous listen connection

Fix Msg: Contact next level of support

7. Desc Msg: Failed to initialize synchronous listen connection at service

Fix Msg: Contact next level of support

8. Desc Msg: Communications not initialized

Fix Msg: Contact next level of support

9. Desc Msg: Failed to register for connection to safServer at service  
<safConnectService>

Fix Msg: Contact next level of support

10. Desc Msg: Input from unknown end point

Fix Msg: Contact next level of support

11. Desc Msg: Failed to register for connection to nlServer at service  
<nlConnectService>

Fix Msg: Contact next level of support

12. Desc Msg: Failed to register for connection to nlServer at port <portnum>

Fix Msg: Contact next level of support

13. Desc Msg: Receive from NLServer failed

Fix Msg: Contact next level of support

14. Desc Msg: Lost connection to Cfg Broker

Fix Msg: Check CfgBroker Processes

15. Desc Msg: Receive from Data Collector failed

Fix Msg: Contact next level of support

16. Desc Msg: Unknown command received from archive client

Fix Msg: Contact next level of support

17. Desc Msg: Can not read command from synchronous client

Fix Msg: Contact next level of support

18. Desc Msg: Error while doing a send, discarding send queue

Fix Msg: Check Client Processes

19. Desc Msg: exiting due to failure in memory allocation

Fix Msg: restart the process after verifying the memory availability in the  
system

## 20. Desc Msg: Failed to Read NLClient listenconfiguration

Fix Msg: update the NLClient.cfg file

The following warning/error/information messages in cutlog will be generated by the NLServer and nlSafServer to reflect various problems. These messages can be seen in /var/adm/custlog file on the CBM to find exact cause and fix.

### 1. Desc Msg: Failed to register for connection to export Server at service <service name>

Fix Msg: Contact next level of support

### 2. Desc Msg: Failed to register for connection to Data Server at port <port number>

Fix Msg: Contact next level of support

### 3. Desc Msg: Failed to register for connection to Data Server at service <service name>

Fix Msg: Contact next level of support

### 4. Desc Msg: Failed to register for signals

Fix Msg: Contact next level of support

### 5. Desc Msg: Failed to send error

Fix Msg: Check SAFServer Process

### 6. Desc Msg: Communications not initialized

Fix Msg: Contact next level of support

### 7. Desc Msg: Input from unknown end point

Fix Msg: Contact next level of support

### 8. Desc Msg: Failed to send registration message to Data Server

Fix Msg: Check Data Server Process

### 9. Desc Msg: Failed to send deregistration message to Data Server

Fix Msg: Check Data Server Process

### 10. Desc Msg: Invalid Message from archive.

Fix Msg: Contact next level of support.

11. Desc Msg: store is disconnected:deregister the connection

Fix Msg: Check Archive Process

12. Desc Msg: Receive from Archive failed

Fix Msg: Contact next level of support

13. Desc Msg: Unreadable Data Server message type

Fix Msg: Contact next level of support

14. Desc Msg: Unreadable OM report

Fix Msg: Contact next level of support

15. Desc Msg: Failed to send correlation error data to Archive

Fix Msg: Check Archive Process

16. Desc Msg: OM Registration failed

Fix Msg: Contact next level of support

17. Desc Msg: Unreadable registration response

Fix Msg: Contact next level of support

18. Desc Msg: OM DeRegistration failed

Fix Msg: Contact next level of support

19. Desc Msg: Unreadable deregistration response from Data Server

Fix Msg: Contact next level of support

20. Desc Msg: Failed to send CM info request to Data Server

Fix Msg: Check Data Access Layer Process

21. Desc Msg: Failed to send deferred registration message to Data Server

Fix Msg: Check Data Access Layer Process

22. Desc Msg: Failed to send re-registration message to Data Server

Fix Msg: Check Data Access Layer Process

23. Desc Msg: Fatal status change  
Fix Msg: Check Data Access Layer Process
24. Desc Msg: Unreadable OM status received from Data Server  
Fix Msg: Contact next level of support
25. Desc Msg: Could not get GroupInfo  
Fix Msg: Contact next level of support
26. Desc Msg: Failed to send nlGrpInfoRsp data to Archive  
Fix Msg: Check Archive Process
27. Desc Msg: Unreadable CM info message from Data Server  
Fix Msg: Contact next level of support
28. Desc Msg: Could not open License File  
Fix Msg: Verify file existence and permission
29. Desc Msg: Unexpected message type from Data Server  
Fix Msg: Contact next level of support
30. Desc Msg: Lost connection to Data Server  
Fix Msg: Check Data Server Process
31. Desc Msg: Receive from Data Server failed  
Fix Msg: Contact next level of support
32. Desc Msg: Communications not initialized  
Fix Msg: Contact next level of support
33. Desc Msg: Failed to send end\_of\_report msg to store  
Fix Msg: Check Archive Process
34. Desc Msg: Connection from unknown end point  
Fix Msg: Contact next level of support
35. Desc Msg: Switch name unknown

Fix Msg: Contact next level of support

36. Desc Msg: Arithmetic overflow in correlation <correlation name>

Fix Msg: Contact next level of support

37. Desc Msg: Failed to send OM data to Archive

Fix Msg: Check Archive Process

38. Desc Msg: Error while doing a send to the Agent, discard send queue

Fix Msg: Check Agent Process

39. Desc Msg: Port for the service <NLservice name> is not available.

Fix Msg: Please update /etc/services file & restart NLServer

40. Desc Msg: Failed to register for connection to export Server at service <service name>

Fix Msg: Contact next level of support

41. Desc Msg: Failed to register for connection to Data Server at port <port num>

Fix Msg: Contact next level of support

42. Desc Msg: Failed to register for connection to Data Server at service <service name>

Fix Msg: Contact next level of support

### 1.2.9.3 log Normalizer and logNormSAF Process

The fault data on being received from call server node is processed by logNormalizer process running on CEM. The logNormSAF process (running on the CBM platform) stores and forward this data to the CEM server.

The logNormalizer process generates error/warning/information messages in custlog whenever there is a problem encountered due to improper configuration, improper log formats etc. These messages can be seen in /opt/nortel/logs/coreEMS/custlog file to find the description and fix of the problem.

1. Desc Msg: Event file <EventFileName> was not found ...logNormalizer exiting



Fix Msg: Check Path.

2. Desc Msg: Event delimiter cannot be more than one charcter long  
...logNormalizer exiting

Fix Msg: check event formatter file for the delimiter after a event name and use it

3. Desc Msg: Event file "<<EventFileName<<" is empty ..logNormalizer exiting

Fix Msg: check path, file name and/or read write permission

4. Desc Msg: Event file "<<EventFileName<<" had errors ..logNormalizer exiting

Fix Msg: please look at the event file to check errors

5. Desc Msg: Mapper file "<<MapperFileName<<" was not found  
...logNormalizer exiting

Fix Msg: check path, file name and/or read write permission

6. Desc Msg: Mapper delimiter cannot be more than one charcter long  
...logNormalizer exiting

Fix Msg: check mapper file for the delimiter after a log name and use it

7. Desc Msg: Mapper file "<<MapperFileName<<" is empty ..logNormalizer exiting

Fix Msg: check path, file name and/or read write permission

8. Desc Msg: Mapper file "<<MapperFileName<<" has errors  
.."<<argv[0]<<" exiting

Fix Msg: please check the mapper file errors

9. Desc Msg: Mapping information parsing error for log "<<logName<<"  
empty information or wrong delimiter used

Fix Msg:

10. Desc Msg: output file "<<outputFileName<<" could not be opened

Fix Msg: No action possible

11. Desc Msg: lostLogFile "<<lostLogFileName<<" could not be opened

Fix Msg: Call Nortel Personal

12. Desc Msg: lostLogFile "<<outputFileName<<" is empty

Fix Msg: Call Nortel Personal

13. Desc Msg: lostLogFormat string is empty

Fix Msg: Call Nortel Personal

14. Desc Msg: lostLogTriggerSize is empty

Fix Msg: Call Nortel Personal

15. Desc Msg: lostLogVisibleMsg string is empty

Fix Msg: Call Nortel Personal

16. Desc Msg: lostLogVisLog string is empty

Fix Msg: Call Nortel Personal

17. Desc Msg: sdmLogList is empty

Fix Msg: Call Nortel Personal

18. Desc Msg: probeTimer string is empty

Fix Msg: No probe is assumed

19. Desc Msg: checkLen string is empty

Fix Msg: No checkLen is assumed

20. Desc Msg: No Lost Log Trigger message has been specified

Fix Msg: Call Nortel Personal

21. Desc Msg: Could not send events to agent. Agent removed from output list.

Fix Msg: No agents connected .. start an agent

22. Desc Msg: Unknown log format. No mapping will be done for input

Fix Msg: Contact Nortel Personal

### 1.3 Hardware Requirements or Dependencies

An IEMS server is required.

SDM/CBM is required

## 1.4 Software Requirements or Dependencies

IEMS Load is required

CEM Server software (GEM18) is required

SDM/CBM (GEM18) software is required

SN08 is required.

## 1.5 Limitations and restrictions

None

## 1.6 Interactions

This feature interacts with A00007304

## 1.7 Glossary

| Term    | Description                                      |
|---------|--------------------------------------------------|
| CEM     | Core Element Manager                             |
| IEMS    | Integrated Element Management System             |
| SDM     | Supernode Data Manager                           |
| CBM     | Core Billing Manager                             |
| PAM     | Pluggable Authentication Module                  |
| OM      | Operational Measurements                         |
| DMS-MSC | Digital Multiplex Switch-Mobile Switching Center |

## 1.8 Appendix A for A00007302: List of Supported Logs

| Log     | Event | Event Label              |
|---------|-------|--------------------------|
| ESA120  | INFO  | ESA DATA GENERATION      |
| ESA121  | INFO  | ESA DATA GENERATION FAIL |
| ATM 300 | FLT   | ATM LCD Alarm Raised     |
| ATM 301 | INFO  | ATM LCD Alarm Cleared    |
| ATM 501 | INFO  | ATM Signalling Status    |

|         |      |                                      |
|---------|------|--------------------------------------|
| ATM 600 | INFO | ATM Address Registration             |
| ATM 605 | INFO | ATM Overload Event                   |
| ATM 806 | TBL  | ATM Packet Alarm                     |
| ATM 807 | INFO | ATM Packet Alarm                     |
| BITS300 | TBL  | BITS Fault Report                    |
| BITS301 | TBL  | BITS Timing Link Degradation         |
| BITS500 | INFO | BITS Timing Link State Change        |
| BITS600 | INFO | BITS Fault Report Cleared            |
| BITS601 | INFO | BITS Timing Link Degradation Cleared |
| BITS610 | INFO | Reference Quality Change             |
| BOOT101 | FAIL | (none)                               |
| C7UP104 | INFO | GROUP CIRCUIT BLO/UBL                |
| C7UP109 | INFO | CQ STATE CHANGE                      |
| C7UP113 | INFO | ISUP MTC TRBL                        |
| C7UP114 | INFO | ISUP ALERT                           |
| C7UP120 | FLT  | INVALID RANGE FIELD                  |
| C7UP130 | FLT  | Hop Counter Expired                  |
| C7UP301 | TBL  | Insuficient HC Value                 |
| CARR300 | RTS  | CARRIER                              |
| CARR310 | FLT  | CARRIER                              |
| CARR320 | FLT  | CARRIER                              |
| CARR330 | INFO | CARRIER                              |
| CARR331 | INFO | CARRIER                              |
| CARR340 | INFO | CARRIER                              |
| CARR341 | INFO | CARRIER                              |
| CARR500 | RTS  | CARRIER                              |
| CARR501 | CBSY | CARRIER                              |
| CARR510 | MANB | CARRIER                              |

|         |        |                                |
|---------|--------|--------------------------------|
| CARR511 | SYSB   | CARRIER                        |
| CARR512 | CBSY   | CARRIER                        |
| CARR800 | RTS    | CARRIER                        |
| CARR801 | INFO   | CARRIER                        |
| CARR810 | TBL    | CARRIER                        |
| CARR811 | TBL    | CARRIER                        |
| CCMT301 | FLT    | Core PVC Segment Fault         |
| CCMT501 | INFO   | Core Connection State Change   |
| CCMT502 | INFO   | Peer Connection State Change   |
| CCMT601 | INFO   | Core PVC Segment Fault Cleared |
| DPTM500 | RTS    | DPT Terminals INSV             |
| DPTM501 | SYSB   | DPT Terminals OOS              |
| DPTM502 | MANB   | DPT Terminals OOS              |
| DPTM503 | PBSY   | DPT Terminals OOS              |
| DPTM504 | OFFL   | DPT Terminals OOS              |
| DPTM550 | INFO   | DPTRKS STATE CHANGE            |
| DPTM560 | INFO   | DPTRKS STATE CHANGE            |
| DPTM700 | INFO   | DPT Data Mismatch              |
| DPTM701 | INFO   | DPT Data Mismatch Cleared      |
| DPTM800 | (none) | 1st Threshold Exceeded         |
| DPTM801 | (none) | 1st Threshold Cleared          |
| DPTM802 | (none) | 2nd Threshold Exceeded         |
| DPTM803 | (none) | 2nd Threshold Cleared          |
| ENET308 | INFO   | (none)                         |
| ENET311 | FAIL   | ENET PSide Link Test           |
| EXT 102 | INFO   | (none)                         |
| EXT 108 | INFO   | (none)                         |
| IWBM500 | SYSB   | IW_Bridges OOS                 |

|         |              |                          |
|---------|--------------|--------------------------|
| IWBM501 | RTS          | IW_Bridges INSV          |
| IWBM603 | INFO         | IWBM Audit               |
| IWBM800 | (none)       | 1st Threshold Exceeded   |
| IWBM801 | (none)       | 1st Threshold Cleared    |
| IWBM802 | (none)       | 2nd Threshold Exceeded   |
| IWBM803 | (none)       | 2nd Threshold Cleared    |
| LINK300 | TBL          | Transport Resource Fault |
| NODE300 | TBL          | Mismatch Fault           |
| NODE301 | TBL          | Hardware Fault           |
| NODE302 | TBL          | Software Alarm           |
| NODE303 | TBL          | Wrong Application Data   |
| NODE323 | TBL          | REx Fault                |
| NODE326 | TBL          | Hardware Fault           |
| NODE328 | TBL          | Hardware Fault           |
| NODE450 | SUMM         | REx Test Summary         |
| NODE500 | INFO         | Node State Change        |
| NODE600 | INFO         | System Recovery Action   |
| SDM 300 | TBL          | SDM Base Maintenance     |
| SDM 301 | TBL          | SDM Base Maintenance     |
| SDM 302 | TBL          | SDM Base Maintenance     |
| SDM 303 | TBL          | SDM Base Maintenance     |
| SDM 306 | TBL /<br>FLT | (none)                   |
| SDM 308 | TBL          | SDM Base Maintenance     |
| SDM 309 | TBL          | SDM Base Maintenance     |
| SDM 314 | n/a          | n/a                      |
| SDM 315 | TBL          | SDM Data Dictionary      |
| SDM 317 | TBL          | SDM Base Maintenance     |
| SDM 321 | TBL          | SDM Base Maintenance     |

|         |      |                                              |
|---------|------|----------------------------------------------|
| SDM 327 | TBL  | SDM Base Maintenance                         |
| SDM 500 | INFO | SDM Base Maintenance                         |
| SDM 501 | RTS  | SDM Base Maintenance                         |
| SDM 502 | MANB | SDM Base Maintenance                         |
| SDM 503 | SYSB | SDM Base Maintenance                         |
| SDM 504 | TBL  | SDM Base Maintenance                         |
| SDM 505 | OFFL | SDM Base Maintenance                         |
| SDM 550 | INFO | Node Status Change                           |
| SDM 600 | INFO | SDM Base Maintenance                         |
| SDM 601 | INFO | SDM Base Maintenance                         |
| SDM 602 | INFO | SDM Base Maintenance                         |
| SDM 603 | INFO | SDM Base Maintenance                         |
| SDM 604 | INFO | Log Delivery Service: lost logs(CM side):XXX |
| SDM 608 | INFO | SDM Base Maintenance                         |
| SDM 609 | INFO | SDM Base Maintenance                         |
| SDM 617 | INFO | SDM Base Maintenance                         |
| SDM 621 | INFO | SDM Base Maintenance                         |
| SDM 627 | INFO | SDM Base Maintenance                         |
| SDM 630 | INFO | SDM Base Maintenance                         |
| SDM 650 | INFO | SDM Link Report                              |
| SDM 700 | INFO | SDM Base Maintenance                         |
| SDMB300 | FLT  | SDM BILLING SYSTEM                           |
| SDMB310 | FLT  | SDM BILLING COMMS                            |
| SDMB315 | TBL  | SDM BILLING SOFT ERROR                       |
| SDMB316 | FLT  | SDM BILLING PROC DEATH                       |
| SDMB320 | TBL  | SDM BILLING BACKUP                           |
| SDMB321 | FLT  | SDM BILLING BACKUP                           |
| SDMB330 | FAIL | SDM BILLING CONFIG                           |

|         |        |                                    |
|---------|--------|------------------------------------|
| SDMB350 | FLT    | SDM BILLING CONTROL                |
| SDMB355 | TBL    | SDM BILLING DISK                   |
| SDMB360 | TBL    | SDM BILLING COMMS                  |
| SDMB365 | TBL    | SDM BILLING SOFT ERROR             |
| SDMB367 | FLT    | SDM BILLING MIB                    |
| SDMB375 | TBL    | SDM BILLING FILE TRANSFER          |
| SDMB380 | FAIL   | SDM BILLING CONFIG                 |
| SDMB390 | TBL    | SDM BILLING FILE TRANSFER SCHEDULE |
| SDMB400 | SUMM   | SDM BILLING SUMMARY                |
| SDMB530 | INFO   | SDM BILLING CONFIG                 |
| SDMB531 | INFO   | SDM BILLING CONFIG                 |
| SDMB550 | INFO   | SDM BILLING CONTROL                |
| SDMB600 | INFO   | SDM BILLING SYSTEM                 |
| SDMB610 | INFO   | SDM BILLING COMMS                  |
| SDMB615 | INFO   | SDM BILLING SOFT ERROR             |
| SDMB620 | INFO   | SDM BILLING BACKUP                 |
| SDMB621 | INFO   | SDM BILLING BACKUP                 |
| SDMB625 | INFO   | SDM BILLING RECOVERY               |
| SDMB650 | INFO   | SDM BILLING CONTROL                |
| SDMB655 | INFO   | SDM BILLING DISK                   |
| SDMB660 | INFO   | SDM BILLING COMMS                  |
| SDMB675 | INFO   | SDM BILLING FILE TRANSFER          |
| SDMB680 | INFO   | SDM BILLING CONFIG                 |
| SDMB820 | (none) | SDM BILLING BACKUP                 |
| SOS 701 | INFO   | TOD Critical Alarm                 |
| SOS 702 | INFO   | TOD Major Alarm                    |
| SOS 703 | INFO   | TOD no Alarm                       |
| SPM 300 | TBL    | Device Fault Report                |



|         |      |                                        |
|---------|------|----------------------------------------|
| SPM 301 | TBL  | Device Patching Report                 |
| SPM 310 | TBL  | ECHO CANCELLER REPORT                  |
| SPM 311 | TBL  | SW Exception Report                    |
| SPM 312 | TBL  | Trap                                   |
| SPM 313 | TBL  | Fault                                  |
| SPM 314 | n/a  | IMC                                    |
| SPM 330 | TBL  | SPM Datasync Report                    |
| SPM 331 | TBL  | Failed Device Protection Switch        |
| SPM 332 | TBL  | SPM REX Aborted                        |
| SPM 334 | TBL  | SPM Clock Performance Out Of Spec      |
| SPM 335 | TBL  | Device Spare                           |
| SPM 336 | TBL  | Clock Range                            |
| SPM 337 | TBL  | SPM Has Entered Holdover               |
| SPM 338 | TBL  | SPM Has Been In Holdover Over 24 Hours |
| SPM 339 | TBL  | Clock Range                            |
| SPM 340 | FAIL | CM WarmSwact SPM Report                |
| SPM 341 | TBL  | SyncRM Entered Holdover                |
| SPM 342 | TBL  | SyncRM Entered Holdover 24             |
| SPM 344 | TBL  | Loss Of BITS Redundancy                |
| SPM 350 | TBL  | Resource Alarm State Changed           |
| SPM 352 | TBL  | SPM Entered ST3E Holdover              |
| SPM 353 | TBL  | SPM Entered ST3E Holdover24            |
| SPM 354 | TBL  | SPM Entered SMC Holdover               |
| SPM 355 | TBL  | SPM Entered SMC Holdover24             |
| SPM 356 | TBL  | SPM - Loss of Clock Unit Redundancy    |
| SPM 357 | TBL  | SPM Node Timing Degradation            |
| SPM 370 | FLT  | SPM Health Monitor Event               |
| SPM 399 | TBL  | SPM Overload Report                    |

|         |      |                                            |
|---------|------|--------------------------------------------|
| SPM 500 | INFO | Device State Change                        |
| SPM 501 | INFO | Sync Operation Mode Change                 |
| SPM 510 | INFO | Sync Reference Switch                      |
| SPM600  | INFO | MS Mode Changed                            |
| SPM 619 | TBL  | Remote MG4K Fault Details                  |
| SPM 625 | INFO | SPM XOVER NonConformity Report             |
| SPM 630 | INFO | Device Protection Switch                   |
| SPM 637 | INFO | SPM Has Exited Holdover                    |
| SPM 638 | INFO | SPM Has Exited 24 Hour Holdover            |
| SPM 641 | INFO | SyncRM Exited Holdover                     |
| SPM 642 | INFO | SyncRM Exited Holdover 24                  |
| SPM 644 | INFO | Loss Of BITS Redundancy Cleared            |
| SPM 650 | PASS | (null)                                     |
| SPM 651 | FAIL | (null)                                     |
| SPM 652 | INFO | SPM Exited ST3E Holdover                   |
| SPM 653 | INFO | SPM Exited ST3E Holdover24                 |
| SPM 654 | INFO | SPM Exited SMC Holdover                    |
| SPM 655 | INFO | SPM Exited SMC Holdover24                  |
| SPM 656 | INFO | SPM Loss of Clock Unit Redunadancy Cleared |
| SPM 657 | INFO | SPM Node Timing Degradation - Cleared      |
| SPM 658 | INFO | SPM Timing Reference Source Fail - Cleared |
| SPM 660 | INFO | ECHO CANCELLER REPORT                      |
| SPM 661 | INFO | ECHO CANCELLER REPORT                      |
| SPM 670 | INFO | SPM Health Monitor Event                   |
| SPM 700 | INFO | SPM Trunk Subgroup DDM Audit               |
| SPM 701 | INFO | SPM Trunk Subgroup DDM Audit               |
| SPM 702 | INFO | SPM Trunk Subgroup DDM Dynamic Update      |
| SPM 703 | INFO | SPM Trunk Member DDM Audit                 |

|         |      |                                                   |
|---------|------|---------------------------------------------------|
| SPM 704 | TBL  | SPM Trunk Member DDM Dynamic Update               |
| SPM 705 | TBL  | SPM PTS Trunk Maintenance                         |
| SPM 706 | INFO | SPM PTS Trunk Maintenance                         |
| SPM 707 | INFO | SPM ISDNPARAMETER DDM Dynamic Update              |
| SPM 708 | INFO | SPM ISDNPARAMETER DDM Audit                       |
| SPM 709 | INFO | SPM ISDNPROT DDM Dynamic Update                   |
| SPM 710 | INFO | SPM ISDNPROT DDM Audit                            |
| TRK 882 | INFO | GROUP INFO                                        |
| XAC 300 | FLT  | LowSM (Low Shared Memory)                         |
| XAC 302 | FLT  | LowPE (Low Processor Element)                     |
| XAC 303 | FLT  | MScomm (Message Switch Communication)             |
| XAC 304 | FLT  | TOD (Time Of Day Clock)                           |
| XAC 305 | FLT  | RTIF (Reset Terminal Interface)                   |
| XAC 306 | FLT  | Disk                                              |
| XAC 307 | FLT  | Tape                                              |
| XAC 308 | FLT  | Image Test Report                                 |
| XAC 309 | FLT  | AMD I (ATM Multinode Data Interface)              |
| XAC 310 | MANB | ManB (Card Manual Busy)                           |
| XAC 312 | FLT  | IOP (Input Output Processor Fault)                |
| XAC 320 | FLT  | SysBTh Alarm Raised                               |
| XAC 321 | FLT  | WgSlot (Shelf Audit Failure - Card Configuration) |
| XAC 322 | TBL  | PETrbl (Trouble)                                  |
| XAC 323 | TBL  | SMTTrbl (Trouble)                                 |
| XAC 324 | TBL  | IOTrbl (Trouble)                                  |
| XAC 325 | FLT  | RIBKEY Detected                                   |
| XAC 326 | FLT  | MS Link Configuration Mismatch                    |
| XAC 327 | FLT  | WgSlot (Card Inserted Into Wrong Slot)            |
| XAC 329 | FLT  | ETHR (Ethernet)                                   |

|         |      |                                     |
|---------|------|-------------------------------------|
| XAC 330 | FLT  | FW version mismatch                 |
| XAC 333 | FLT  | FW loading failed                   |
| XAC 400 | INFO | XA-Core Summary Report              |
| XAC 413 | SUMM | RExSch (REx Schedule Failure)       |
| XAC 415 | INFO | Routine Exercise (REx) Report       |
| XAC 418 | INFO | Split (Entry to Split Mode Failed)  |
| XAC 420 | INFO | SysBTh Ctrl Change                  |
| XAC 600 | INFO | LowSM Condition Cleared             |
| XAC 601 | INFO | MemLim Condition Cleared            |
| XAC 602 | INFO | LowPE Condition Cleared             |
| XAC 603 | INFO | MScomm Alarm Cleared                |
| XAC 604 | INFO | TOD Alarm Cleared                   |
| XAC 605 | INFO | RTIF Alarm Cleared                  |
| XAC 606 | INFO | Disk Alarm Cleared                  |
| XAC 607 | INFO | Tape Alarm Cleared                  |
| XAC 608 | INFO | Image (Test Passed / Alarm Cleared) |
| XAC 609 | INFO | AMD link condition cleared.         |
| XAC 610 | RTS  | Returned To Service                 |
| XAC 612 | INFO | IOP Fault Cleared                   |
| XAC 613 | SUMM | RExSch Alarm Cleared                |
| XAC 614 | INFO | XATrap Alarm Cleared                |
| XAC 615 | INFO | REx Started                         |
| XAC 618 | INFO | Split (Split Mode Entered)          |
| XAC 619 | INFO | Split Mode Exited                   |
| XAC 620 | INFO | SysBTh Alarm Cleared                |
| XAC 622 | INFO | PETrbl Alarm Cleared                |
| XAC 623 | INFO | SMTTrbl Alarm Cleared               |
| XAC 624 | INFO | IOTrbl Alarm Cleared                |

|         |      |                                   |
|---------|------|-----------------------------------|
| XAC 625 | INFO | RIBKEY Removed                    |
| XAC 626 | INFO | MS Link Configuration Restored    |
| XAC 627 | INFO | WgSlot Cleared - Card Removed     |
| XAC 628 | INFO | XA-Core Provisioning Report       |
| XAC 629 | INFO | Ethernet link condition cleared.  |
| XAC 630 | INFO | No FW version mismatch            |
| XAC 631 | INFO | FW soaking started                |
| XAC 632 | INFO | FW soaking completed              |
| XAC 633 | INFO | FW loading started                |
| XAC 634 | INFO | FW loading completed              |
| XAC 635 | INFO | FW soaking in progress            |
| XAC 640 | INFO | Test Report                       |
| XAC 641 | INFO | Alarm Enable/Disable Notification |
| XAC 801 | TBL  | MemLim (Memory Limit)             |
| XAC 814 | TBL  | XATrap (XA-Core High Trap Rate)   |
| XACP300 | TBL  | Memory Blocking High              |
| XACP500 | INFO | Memory Blocking Normal            |
| XACP600 | INFO | Memory Blocking Summary           |

## 1.9 Appendix B for A00007302: List of Supported OM's

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| AABS     | AABSFILT | AABSHAND | AASV     | ACB      |
| ACCSBNS  | ACCSBNSE | ACCSCCV  | ACCSCCVE | ACDGRP   |
| ACDMISPL | ACMS     | ACRJ     | ACRTS    | ACRTS    |
| ACSYSTR  | ACTAKEDN | ACTRBL   | ADASAPU  | ADASDSGN |
| ADASSRV  | AIN      | AINACG   | AINICOFF | AINICSUB |
| AINNCR   | AINOGOFF | AINOGSB2 | AINOGSUB | AIOD     |
| AL1SVCOM | AL1SVCOM | AMA      | ANIOVFL  | ANN      |
| APOCCS   | APSYS    | AR       | ARAN     | ARN      |
| ASR      | ASUFBUS  | ASUMEMUT | ATRK     | ATRK     |
| ATTAMA   | ATTAMA2  | ATTLAMA  | AUDSRVS  | AUTSPID  |
| BCAPCG   | BCAPOF   | BCLID    | BCLIDNL  | BCLIDO   |
| BCTPOOL  | BCTTANDM | BLUEBOX  | BLUEBSTR | C7GTLNK  |
| C7GTWSCR | C7GWSCCP | C7HSLAL1 | C7HSLAL2 | C7HSLATM |
| C7HSLCAR | C7LINK1  | C7LINK2  | C7LINK3  | C7LINK4  |
| C7LKSET  | C7LPP    | C7LPP2   | C7MTP    | C7MTPRES |
| C7ROUTE  | C7ROUTE2 | C7ROUTER | C7RTESET | C7SCCP   |
| C7SCCPCO | C7SCCPX  | CAINAGOM | CAINGOM2 | CAINIP   |
| CAINLNP  | CAINMGR2 | CAINMGS2 | CAINMSGR | CAINMSGs |
| CAINNCRS | CAINOM   | CAINTRI2 | CAINTRIG | CAINUIF  |
| CALLFWD  | CALLHOLD | CALLOG   | CALLRDT  | CALLWAIT |
| CBK      | CCTOOM   | CDACTS   | CDCOM    | CDMCCS   |
| CDR250   | CF3P     | CF6P     | CFRA     | CFWPOTS  |
| CMG      | CMSGCARR | CMSGGEN  | CNAB     | CNAMD    |
| CND      | CNDB     | CNDXPM   | COT      | CP       |
| CP2      | CPICG    | CPICKUP  | CPUSTAT  | CSL      |

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| CSMI     | CTFP     | CTRYDIR  | CWTPOTS  | DAISGEN  |
| DALINK   | DAMISC   | DCADTALG | DCAIA    | DCAMCEIA |
| DCM      | DCMEBSS  | DCRDEST  | DCRICTRK | DCRLINK  |
| DCRMISC  | DDU      | DPTNODE  | DPTOFC   | DPTOFCP  |
| DRCW     | DRM      | DS1CARR  | DSCWID   | DSINWTS  |
| DSPRMAN  | DTSR     | DTSRPM   | DUTLGEN  | EACARR   |
| EADLD    | EASHRTRK | EATSMS   | EBSMSGCT | ECANRMAN |
| EIUETHER | ENETMAT  | ENETOCC  | ENETPLNK | ENETSYS  |
| ENG640M1 | ESP      | ESUP     | EXNDINV  | EXT      |
| FBTRAFF  | FC       | FCDRALG2 | FCDRALGR | FCDRLOG  |
| FCDRTM1E | FCDRTM2E | FCDRTMP1 | FCDRTMP2 | FCNF     |
| FLEXDIAL | FLEXTYPE | FPDABM   | FPDEVICE | FPSCSI   |
| FRSAGENT | FRSPM    | FRT1     | FTAM     | FTROM    |
| FTRQ     | FTS      | GIACGRP  | GTID     | GWOVLOM  |
| HDBOM    | HFPOM    | HPCBASIC | HPCTRKGP | HTR      |
| HUNT     | IBNAC    | IBNGRP   | IBNSG    | IBNSGLDN |
| ILDBD    | ILDBRA   | ILDMSGCT | ILDOVLD  | ILDSTAT  |
| ININTWRK | INSCTP   | IOC      | IOSYS    | ISA      |
| ISDD     | ISDNPDOM | ISGBD    | ISGBRA   | ISGCPU   |
| ISGOVLD  | ISUPCGRP | ISUPCKTA | ISUPCONG | ISUPCONN |
| ISUPERRS | ISUPUSAG | IWBM     | KSHUNT   | LDS      |
| LIDBCCV  | LINAC    | LINEHAZ  | LM       | LMD      |
| LMSCPUST | LMSMEM   | LNP      | LNREDIAL | LOGS     |
| M20CARR1 | M20CARR2 | M3UA     | MACHCONG | MDCWAKUP |
| MDSACT   | MDSSTAT  | MNATM    | MNATMA1  | MNATMA5  |
| MNATMCH  | MNATMVC  | MPB      | MPCBASE  | MPCFASTA |
| MPCLINK2 | MPCLINK3 | MPHCON   | MPHGRP   | MS       |

|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| MSCHAIN  | MSCHNLK  | MSFBUS   | MSFBUSTP | MSGPSOC  |
| MTA      | MTU      | MULTAUTH | MWICTCAP | MWTCAR   |
| MWTCAR2  | NACDGRP1 | NACDGRP2 | NARUSAGE | NCMCPUST |
| NDS0CARR | NEMASAPL | NETMSG   | NGSSOM   | NIUFBUS  |
| NIUMEMUT | NMC      | NMTCLINK | NMTCNODE | NMTCTYPE |
| NMTCUNIT | NPAPPEG  | NRS      | NRS      | NSC      |
| NSCACG   | NWMFRRCT | NWMFRRTG | NWMSILC  | NWMTGCNT |
| NX25L2   | NX25L3   | NX25LNK  | NX25MLP  | OADATCOM |
| OAFLTRIG | OAINNODE | OAINQMS  | OAINRTE  | OANODEDC |
| OAPCALP1 | OAPCALP2 | OAPCALP3 | OAPCALP4 | OAPCALP5 |
| OAPCALP6 | OAPCALP7 | OAPCALP8 | OAPCALP9 | OAPCP10  |
| OAPMERRN | OAPMERRS | OAPMTYPN | OAPMTYPS | OAPNMIS  |
| OAPNMTC  | OAPSPMTC | OASNPLDC | OASNPOOL | OASVNDCP |
| ODBOM    | OFF250   | OFZ      | OFZ2     | OFZ2NET1 |
| OFZ2NET2 | OGTQMS   | OHBTDTU  | OHBTRES  | OHBTTYPE |
| OHQCBQCG | OHQCBQR2 | OHQCBQR3 | OHQCBQR4 | OHQCBQRT |
| ONI      | OPCHOICE | OSACCP1  | OSACCP2  | OSACND   |
| OSACSP   | OSNND    | OSNSP    | OTS      | PCMCARR  |
| PCNF     | PM       | PM1      | PM2      | PMMSGCNT |
| PMOVL    | PMSTAT   | PMTYP    | PPCO     | PRADCHL2 |
| PRAFAC   | PRASERV  | PRIMWIC  | PRISVCS  | PRKOM    |
| PRP      | PSN_ERDC | PSN_ERFM | PSN_ERPS | PSN_FCTR |
| PSN_NOTF | PSN_PRIM | PSN_USAG | QMSACT   | QMSDATA  |
| QMSMIS   | RADR     | RCF      | RCHDOPT  | RCVR     |
| RECMDOVF | REVALLO  | RLCDIS   | RLDBD    | RLDBRA   |
| RLDMSGCT | RLDSTAT  | RLT      | RMANCMR  | RMSGOMGP |
| RND      | ROAPPL   | ROMISC   | RRTE     | RSCIR    |



|          |          |          |          |          |
|----------|----------|----------|----------|----------|
| RSCIS    | RSDT     | RTEASUM  | RTESVCS  | RTFEAT   |
| RTLTSUM  | RTRSCCP  | RTRTCAP  | SACB     | SCA      |
| SCAISERV | SCAISRV2 | SCAISRV3 | SCAISRV4 | SCAITRAN |
| SCF      | SCMP     | SCPOTS   | SCRJ     | SDS      |
| SEIUTRAN | SERVACT  | SERVBLK  | SETRAF   | SIMRING  |
| SITE     | SITE2    | SITE3    | SLLCOM   | SLLNK    |
| SLLNKINC | SLQ      | SLVPOPT  | SMCOM    | SME      |
| SMGENOM  | SMNCOM   | SMSTOPS  | SOTS     | SPAP     |
| SPC      | SPEEDCAL | SPMACT   | SPMOVLD  | SPMUSAGE |
| SPPIN    | SPRING   | SRA      | SRAOM    | STN      |
| STORE    | SVCT     | SYSPERF  | TC7WRLSS | TCAPERRS |
| TCAPUSAG | TCW      | TDCPROT  | TDCROUT  | TDGTHRU  |
| TDR      | TDRFTMPL | TFCANA   | TFREE533 | TM       |
| TME      | TONES    | TOPAAPPL | TOPASCCP | TOPPACT1 |
| TOPPACT2 | TOPPACT3 | TOPPACT4 | TOPPDID1 | TOPPDID2 |
| TOPPDID3 | TOPPDID4 | TOPPDID5 | TOPPDID6 | TOPPMSG  |
| TOPQOCPS | TOPS950  | TOPSAICC | TOPSALT  | TOPSARU  |
| TOPSBRND | TOPSCCAB | TOPSDA   | TOPSDACC | TOPSDEV  |
| TOPSEA   | TOPSINCC | TOPSISUP | TOPSKFAM | TOPSLNP  |
| TOPSMISC | TOPSMTCE | TOPSOC   | TOPSOLNE | TOPSOLNS |
| TOPSPARS | TOPSPSZ  | TOPSQMS  | TOPSRLT2 | TOPSRON  |
| TOPSRTRS | TOPSTRAF | TOPSUSE  | TOPSVC   | TRA125M1 |
| TRA125M2 | TRA250M1 | TRK      | TRK2NET1 | TRK2NET2 |
| TRKQOSOM | TRKVERDS | TRMSCRND | TRMSCRNO | TRMTCM   |
| TRMTCM2  | TRMTCU   | TRMTCU2  | TRMTCU3  | TRMTER   |
| TRMTFR   | TRMTFR2  | TRMTFR3  | TRMTPR   | TRMTRS   |
| TRNK2    | TROUBLEQ | TS       | TTCCARR  | TWCIBN   |

|          |          |          |         |          |
|----------|----------|----------|---------|----------|
| TWCPOTS  | U3WC     | UCDGRP   | UNBCDC  | UNBMISC  |
| UPSNACT  | UPSNFAIL | USAGSAMP | USGSECS | UTR      |
| VAMPACG  | VFGIWUSE | VFGUSAGE | VOW     | VPSC     |
| VPSC     | VPTRUSAG | VSNCOM   | VSNLINK | VTCAPERR |
| VTCAPRCV | VTCAPSNT | WBTRK    | WC      | WIDEBAND |
| WINTOPS  | XACORE   | XACPOM   | XACSRVC | XASTAT   |
| XIPCOMID | XIPDCOM  | XIPMISC  | XIPSVCS | XLIUL3   |
| XPMLNK   | XPMMSGOC | XPMOCC   | XPMOVL  |          |

## ***Product = IEMS***

### **A00007304--SN08 CEM I & C on IEMS**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

#### **1.2 Description**

The CEM server functionality will be provided in conjunction with the IEMS server. CEM will be installed as an overlay on IEMS and SSPFS.

The CEM server is an element manager for the DMS node. It provides powerful fault, performance and configuration management toolsets. This server works in conjunction with the CEM browser which will be integrated into the IEMS product (see feature A00007302).

This feature covers the installation of the CEM server onto the IEMS server. This feature also covers the installation of the CEM components on the SDM and CBM. This feature will also incorporate the Synchronized Backup Manager to be used by CEM (for information about the Backup Manager see feature A00006979)

## 1.3 CEM Installation

The procedure for adding a CEM software package to the server are as follows:

- 1 Obtain the cem tar file and untar it.
- 2 Run the cem\_setup script. Use the full path to start it.
- 3 Use pkgadd to install the Help Package.
- 4 Start the CEM server using /opt/servman/bin/servstart CEM

### 1.3.1 Removing the CEM software

The procedure for removing a CEM software package from the server are as follows:

1. Stop the CEM server using /opt/servman/bin/servstop CEM. Note: It may take a few minutes for CEM to stop completely.
2. Run the cem\_setup uninstall script.
3. Use pkgrm to remove the help package.

## 1.4 CEM Commissioning Manager

The CEM Commissioning Manager is a Java-based graphic user interface tool for configuring managed node instances. A command line interface is also available. The following sections describe in detail how to use the Commissioning Manager.

### 1.4.1 Launch The Commissioning Manager

To launch the Commissioning Manager, do the following:

1. Login on the IEMS server as root.
2. Change directory to /opt/nortel/cem/data/coreEMS/nodes/server/bin/
3. Issue the command “.configCEMS -c” for the command line interface.

The Commissioning Manager main menu will be displayed on the screen after the command line interface being invoked.

#### 1.4.1.1 Create A Managed Node Instance

To create a new managed node instance:

1. Select “1” (Commission a new node) from the Commissioning Manager Command Line Interface main menu.

```
Nortel Networks coreEMS Commissioning Manager
Main menu
-----
[1] Commission a new node
[2] Reconfigure an existing node
[3] Delete an existing node
[4] Add a mated pair monitor
[5] Delete a mated pair monitor
[6] SDM to CBM migration
[0] Exit
Selection: 1
```

2. Then select DMS for the new node when prompted for the device type.

```
*** Configure a Node Instance ***
[1] DMS
[2] HLR200
[3] MDM
[4] NSP
[5] SESM
[6] USP_NES
[7] DS
Select a device type for the new node: 1
```

3. Input a name for the new node when prompted for the “Element Name” of the node. The element name should be a string up to 15 characters drawn from the alphabet (a-z), digits(0-9) and minus sign(-). The first character must be an alpha character and the last character must not be a minus sign. The element name can’t be “server”, “localhost”, “loghost” or the hostname of the localhost.

Hint: Input a string up to 15 characters drawn from "-a-z0-9". The 1st character must be an alpha character; the last one must not be a minus sign. Element name cannot be “server”, “localhost”, “loghost” or the hostname of the localhost.  
Mandatory input.  
Element Name: **SDMA2**

4. Input the region name when prompted:

Hint: Enter the region path to the node or select one from the list.  
Valid path characters include alpha-numeric and the '/' characters.  
Mandatory input.  
List of existing regions:  
Nortel  
Region: **Nortel**

5. Select GEM18 for this new node when prompted for “Software Release”.

Hint: Choose a software version.  
Mandatory input.  
[1] GEM18  
Software Release (1): **1**

6. Input the target IP address when prompted for the “Target SDM IP Address”. The target IP address should be in dot-decimal format.

Hint: Input a dot-decimal representation of an IP address or the string 'localhost'.  
Mandatory input.  
Target SDM IP Address: **47.142.106.26**

7. Enter No Call Trace will not be used.

Hint: Answer Yes if the SDM has Call Trace installed, otherwise answer No.  
Mandatory input.  
[1] Yes  
[2] No  
Enable Call Trace (1): **2**

8. Enter No do not install Billing Manager

Hint: Answer Yes if this DMS is an MSC/TriNode, No if this DMS is an HLR.  
Mandatory input.  
[1] Yes  
[2] No  
Install Billing Manager (1): **2**

**9. Answer No to USP**

Hint: Answer Yes if this DMS has USP, otherwise answer No. Not valid if Billing Manager = Yes  
Mandatory input.  
[1] Yes  
[2] No  
Does This DMS Have USP (2): **2**

**10. Answer “y” at the prompt “Proceed to create this node?”.**

Proceed to create this node? [y/n](n):**y**

**11. Answer yes the SDM is already in server mode.**

Commissioning node, please wait...  
Commissioning node completed successfully!  
  
Is sdma2 already in server mode? [y/n](n): **y**

**12. Answer Y to start the nodes applications**

Start all applications of node susan? [y/n](n): **y**

**13. Wait till you get the rts completed message**

Returning to service all applications of node susan.  
This action may take a few minutes.  
Please wait...  
Busy/Rts action completed!

## 14. Exit configCEMS

```
Nortel Networks coreEMS Commissioning Manager
Main menu
-----
[1] Commission a new node
[2] Reconfigure an existing node
[3] Delete an existing node
[4] Add a mated pair monitor
[5] Delete a mated pair monitor
[6] SDM to CBM migration
[0] Exit
Selection: 0
```

### 1.4.1.2 Delete A Managed Node Instance

Users can delete a managed node instance, and all data and configuration for that node would be permanently removed from the system.

To delete a managed node instance:

1. Select “3” (Delete an existing node) from the Commissioning Manager Command Line Interface main menu.
2. Then select the node instance to be deleted.
3. Answer “y” at the prompt “Proceed to delete this node?”

## 1.5 Backup of CEM

CEM will be backed up using the Synchronized Backup Manager (Feature A00006979). When this backup is run, the information needed by CEM to restore will be located in /opt/nortel/cem/data/coreEMS/configBackup.

## 1.6 Restore of CEM

To restore CEM, make sure that the /opt/nortel/cem/data/coreEMS/configBackup directory contains the following: data\_dir, ldapConfig.tar, nodes.tar and server. Make sure CEM is stopped with servquery -status -group CEM command. If CEM is not stopped run servstop CEM. Then run /opt/nortel/cem/data/coreEMS/nodes/server/bin/postRestore.sh.

## 1.7 CEM SAF (Store and Forward) Process on SDM/CBM

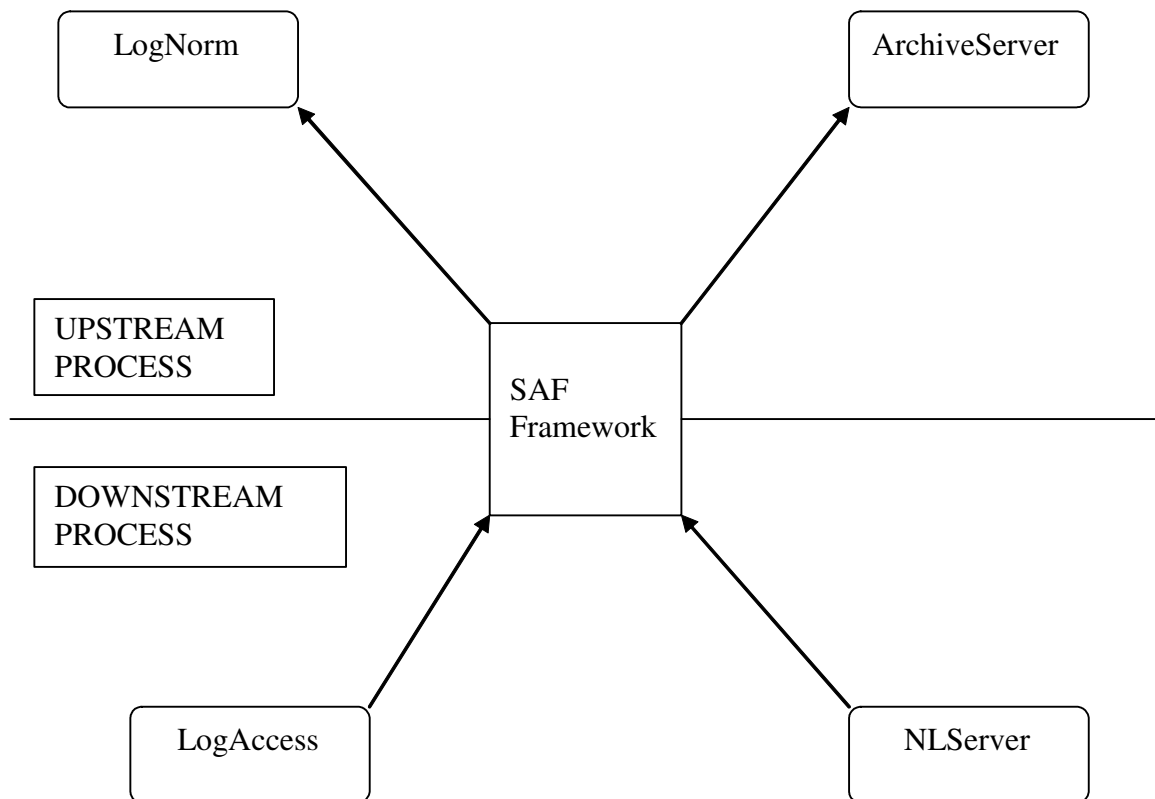
### 1.7.1 Introduction

CEM SAF (Store and Forward Process) Framework has been designed to serve two purposes:

1. Storing and Forwarding the SDM/CBM data on to the appropriate CEM Server process.
2. Synchronization after disconnection from the CEM server process and SDM/CBM.

### 1.7.2 Process Interaction Diagram

Data flow diagram



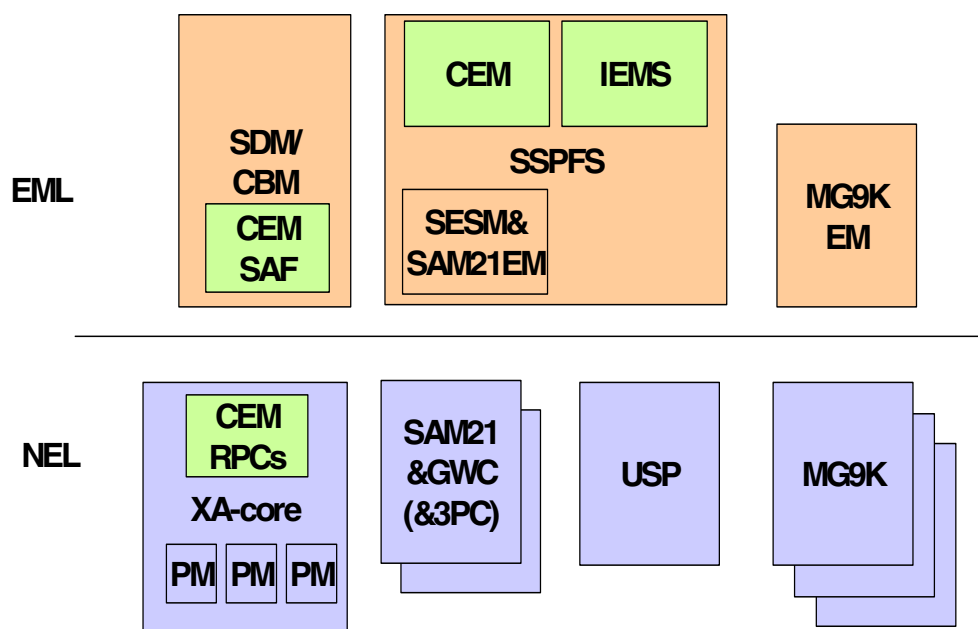
By default SAF process on the SDM/CBM will not be in service after CEM is installed. It has to be turned on to be “in service” state.



### 1.7.3 IEMS and CEM succession architecture

In SN08, the CEM integration with IEMS is taken to the next level, pulling the CEM and IEMS into a combination load and the launching capabilities are further refined and integrated. Additionally, the fault handling and interface between the two management systems will be extended and enhanced to provide uniform handling of alarms between the two.

The Figure below provides an overview of IEMS and CEM succession architecture.



### 1.8 CEM SAF logs on SDM/CBM

The processes included in CEM SAF Framework throw a number of logs depicting any Trouble or Information regarding CEM processes.

The Description of all the SAF Framework processes, warning and info logs thrown by them is documented in the FM section.

### 1.9 File Sets and Directory structure for CEM Processes

The File sets on sdm including CEM processes are:

SDM\_CEM.SAF

SDM\_GEM.dmsDataSrv

SDM\_TntFTPHndl.TntFTPHndl

### 1.9.1 Directory Structure for SAF Data

Data Storage:

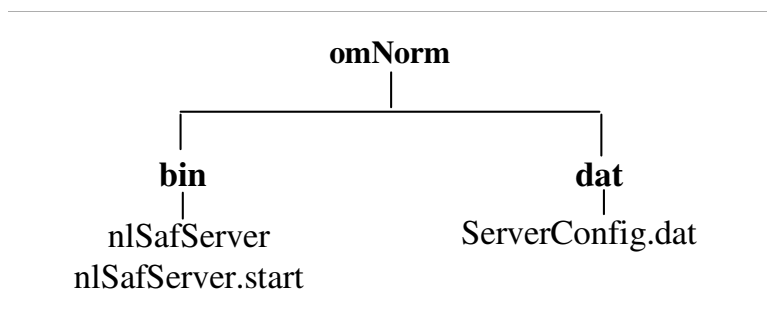
SAF Server stores data in “SAF.DB”

SAF Client stores data in the field specified in “serverConfig.dat” and stores it in the path specified in the file.

### 1.9.2 Directory Structure for SAF package

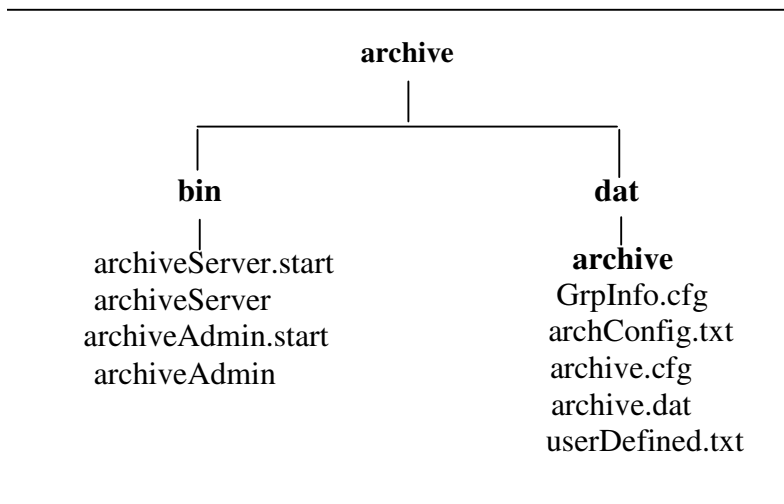
Directory Structure for SAFServer package (on sdm)

From /mscomc/OMC\_S\



Directory Structure for SAFClient package (on server)

From /opt/nortel/data/coreEMS/nodes/<node name>



## 1.10 Ports assigned for the CEM processes

**Table 2:**

| Application      | Port   | Protocol | Description                                       |
|------------------|--------|----------|---------------------------------------------------|
| switchExport     | 7788   | tcp      | switch Mass Export service                        |
| NLServer         | 7982   | tcp      | PM service                                        |
| admind           | 8102   | tcp      | SDM process/link/logic volume information service |
| dmsDataServer    | 8449   | tcp      | tuple service                                     |
| dmsDataServer    | 8450   | tcp      | table schema service                              |
| dmsDataServer    | 8614   | tcp      | table change notification service                 |
| rpcServer        | 22333  | tcp      | rpc service                                       |
| migrationClient  | 22395  | tcp      | control port for Migration Client                 |
| TelnetFTPHandler | 22397  | tcp      | MAPCI pass-through to MSC/HLR                     |
| TelnetFTPHandler | 22398  | tcp      | ftp pass-through to MSC/HLR                       |
| TelnetFTPHandler | 22399  | tcp      | telnet to SDM                                     |
| TelnetFTPHandler | 22400  | tcp      | ftp to SDM                                        |
| TelnetFTPHandler | 22402* | tcp      | telnet access to 3PC application                  |
| tpcStsQuery      | 22403* | tcp      | telnet access to 3PC application status           |
| TelnetFTPHandler | 22404  | tcp      | non-secure ftp access to CM                       |
| TelnetFTPHandler | 22405  | tcp      | non-secure ftp access to SDM/FT                   |
| exportLog        | 23000  | tcp      | CAP log export service                            |
| nlSafServer      | 26002  | tcp      | NLServer store and forward port                   |

**Table 2:**

| Application | Port  | Protocol | Description                          |
|-------------|-------|----------|--------------------------------------|
| logNormSAF  | 26003 | tcp      | logNormalizer store and forward port |

## 1.11 Logs being delrepped for CEM application

**Table 3: List of log delrepped.**

| Logs |
|------|
| AUTH |
| CAFT |
| CALM |
| CDPD |
| CHIP |
| CLFL |
| CPER |
| CPRT |
| CTID |
| DEPS |
| DFA  |
| DIM  |
| DROP |
| ERV  |
| ESNF |
| FCEL |
| FRAU |
| FRS  |
| GAME |

**Table 3: List of log delrepped.**

| Logs |
|------|
| HMT  |
| IOGA |
| IS41 |
| LAM  |
| MBPG |
| MCD2 |
| MCD3 |
| MCDR |
| MIWF |
| MLNP |
| MTX  |
| NCAS |
| NOPT |
| OCC  |
| OM2  |
| OMGA |
| OTAF |
| PCO  |
| PVAL |
| RAD  |
| RFES |
| RFP  |
| RFPE |
| RPC  |
| RRIF |

**Table 3: List of log delrepped.**

| Logs |
|------|
| RSSI |
| SMO  |
| SMS  |
| SMT  |
| SPRF |
| SSR  |
| TIER |
| TUPL |
| X75  |

### 1.12 Hardware Requirements or Dependencies

An IEMS server is required.

An SDM and CBM are also required.

### 1.13 Software Requirements or Dependencies

SN08 is required.

### 1.14 Limitations and restriction

SN08 is required.

### 1.15 Interactions

This feature interacts with A00007302 and A00006979

### 1.16 Glossary

| Term | Description                          |
|------|--------------------------------------|
| CEM  | Core Element Manager                 |
| DMS  | Digital Multiplex Switch             |
| IEMS | Integrated Element Management System |

## ***Fault Management for A00007304***

### **2.1 Logs**

#### **2.1.1 CEM SAF Processes logs**

CEM SAF (Store and Forward) Framework throws a number of logs depicting any Trouble or Information regarding CEM processes.

All these logs will fall under two categories:

TROUBLE log or INFO log.

TROUBLE log will be identified in the range TMN300~399

INFO log will be identified in the range TMN600~699

For example:

TMN600: Information only

TMN601: File IO info

TMN604: Application status

TMN630: DataServer OK

TMN302: System error

TMN301: Application error

TMN303: Communication error

TMN309: Data Server error

TMN311: Fatal error

#### **2.1.2 Data Server process logs**

The dmsDataServer process runs on the SDM/CBM, connects to call server node (core) and receives both the Performance and Configuration data through Base APIs (Table Access Service and OM Access Service). Depending on whether its operational measurements (OM) or configuration data, it forwards it to performance manager or configuration manager respectively.

The following warning/error/information messages are generated in custlog to reflect various problems. These messages can be seen in /var/adm/custlog file to find exact cause and fix.

1. Desc Msg: Could not read switch name  
Fix Msg: Check state of switch
2. Desc Msg: Could not create tuple  
Fix Msg: Check state of switch
3. Desc Msg: Could not read VRINV table  
Fix Msg: Check state of switch
4. Desc Msg: Could not initialize OM Access  
Fix Msg: Contact system administrator
5. Desc Msg: Could not initialize OM Access  
Fix Msg: Contact system administrator
6. Desc Msg: Could not get keyinfo object, excluding group, <group>  
Fix Msg: Check OM group for bad key/info type
7. Desc Msg: Could not get key, excluding group, <group>  
Fix Msg: Check OM group for bad key type
8. Desc Msg: Could not get info, excluding group, <group>  
Fix Msg: Check OM group for bad info type
9. Desc Msg: Could not register initialization timer  
Fix Msg: Contact administrator
10. Desc Msg: Rejecting register request for excluded group: <group>  
Fix Msg: Check group key/info for validity
11. Desc Msg: "Could not open listening connection  
Fix Msg: Check /etc/services
12. Desc Msg: Could not open listening connection: <service name>  
Fix Msg: Check services file



### 2.1.3 NLClient and NLServer logs

The operational measurements (OMs) are available on the CEM server for graphing, dashboard, thresholding, mass export and correlation. The CEM server gets all the performance data from SDM/CBM through NLServer and nlSafServer processes running on SDM/CBM. The nlClient process running on the IEMS server receives OM data from nlSafServer and NLServer, processes it and forwards it to the upstream processes. All these processes makes the handling of OM data easier and faster and offloads the load on CEM server in processing OM data.

The following warning/error/information messages in custlog will be generated by the NLServer and nlSafServer to reflect various problems. These messages can be seen in /var/adm/custlog file on the SDM/CBM to find exact cause and fix.

1. Desc Msg: Failed to register for connection to export Server at service <service name>

Fix Msg: Contact next level of support

2. Desc Msg: Failed to register for connection to Data Server at port <port number>

Fix Msg: Contact next level of support

3. Desc Msg: Failed to register for connection to Data Server at service <service name>

Fix Msg: Contact next level of support

4. Desc Msg: Failed to register for signals

Fix Msg: Contact next level of support

5. Desc Msg: Failed to send error

Fix Msg: Check SAFServer Process

6. Desc Msg: Communications not initialized

Fix Msg: Contact next level of support

7. Desc Msg: Input from unknown end point

Fix Msg: Contact next level of support

8. Desc Msg: Failed to send registration message to Data Server

Fix Msg: Check Data Server Process

9. Desc Msg: Failed to send deregistration message to Data Server

Fix Msg: Check Data Server Process

10. Desc Msg: Invalid Message from archive.

Fix Msg: Contact next level of support.

11. Desc Msg: store is disconnected:deregister the connection

Fix Msg: Check Archive Process

12. Desc Msg: Receive from Archive failed

Fix Msg: Contact next level of support

13. Desc Msg: Unreadable Data Server message type

Fix Msg: Contact next level of support

14. Desc Msg: Unreadable OM report

Fix Msg: Contact next level of support

15. Desc Msg: Failed to send correlation error data to Archive

Fix Msg: Check Archive Process

16. Desc Msg: OM Registration failed

Fix Msg: Contact next level of support

17. Desc Msg: Unreadable registration response

Fix Msg: Contact next level of support

18. Desc Msg: OM DeRegistration failed

Fix Msg: Contact next level of support

19. Desc Msg: Unreadable deregistration response from Data Server

Fix Msg: Contact next level of support

20. Desc Msg: Failed to send CM info request to Data Server

Fix Msg: Check Data Access Layer Process

21. Desc Msg: Failed to send deferred registration message to Data Server  
Fix Msg: Check Data Access Layer Process
22. Desc Msg: Failed to send re-registration message to Data Server  
Fix Msg: Check Data Access Layer Process
23. Desc Msg: Fatal status change  
Fix Msg: Check Data Access Layer Process
24. Desc Msg: Unreadable OM status received from Data Server  
Fix Msg: Contact next level of support
25. Desc Msg: Could not get GroupInfo  
Fix Msg: Contact next level of support
26. Desc Msg: Failed to send nlGrpInfoRsp data to Archive  
Fix Msg: Check Archive Process
27. Desc Msg: Unreadable CM info message from Data Server  
Fix Msg: Contact next level of support
28. Desc Msg: Could not open License File  
Fix Msg: Verify file existence and permission
29. Desc Msg: Unexpected message type from Data Server  
Fix Msg: Contact next level of support
30. Desc Msg: Lost connection to Data Server  
Fix Msg: Check Data Server Process
31. Desc Msg: Receive from Data Server failed  
Fix Msg: Contact next level of support
32. Desc Msg: Communications not initialized  
Fix Msg: Contact next level of support
33. Desc Msg: Failed to send end\_of\_report msg to store

Fix Msg: Check Archive Process

34. Desc Msg: Connection from unknown end point

Fix Msg: Contact next level of support

35. Desc Msg: Switch name unknown

Fix Msg: Contact next level of support

36. Desc Msg: Arithmetic overflow in correlation <correlation name>

Fix Msg: Contact next level of support

37. Desc Msg: Failed to send OM data to Archive

Fix Msg: Check Archive Process

38. Desc Msg: Error while doing a send to the Agent, discard send queue

Fix Msg: Check Agent Process

39. Desc Msg: Port for the service <NLservice name> is not available.

Fix Msg: Please update /etc/services file & restart NLServer

40. Desc Msg: Failed to register for connection to export Server at service <service name>

Fix Msg: Contact next level of support

41. Desc Msg: Failed to register for connection to Data Server at port <port num>

Fix Msg: Contact next level of support

42. Desc Msg: Failed to register for connection to Data Server at service <service name>

Fix Msg: Contact next level of support

#### **2.1.4 log Normalizer and logNormSAF Process logs**

The fault data on being received from call server node (core) is processed by logNormalizer process running on CEM. The logNormSAF process (running on the SDM/CBM) stores and forward this data to the CEM server.

The logNormalizer process generates error/warning/information messages in custlog whenever there is a problem encountered due to improper

configuration, improper log formats etc. These messages can be seen in /opt/nortel/logs/coreEMS/custlog file on the CEM server to find description and fix of the problem.

1. Desc Msg: Event file <EventFileName> was not found ...logNormalizer exiting

Fix Msg: Check Path.

2. Desc Msg: Event delimiter cannot be more than one character long...logNormalizer exiting

Fix Msg: check event formatter file for the delimiter after a event name and use it

3. Desc Msg: Event file "<<EventFileName<<" is empty..logNormalizer exiting

Fix Msg: check path, file name and/or read write permission

4. Desc Msg: Event file "<<EventFileName<<" had errors..logNormalizer exiting

Fix Msg: please look at the event file to check errors

5. Desc Msg: Mapper file "<<MapperFileName<<" was not found...logNormalizer exiting

Fix Msg: check path, file name and/or read write permission

6. Desc Msg: Mapper delimiter cannot be more than one character long...logNormalizer exiting

Fix Msg: check mapper file for the delimiter after a log name and use it

7. Desc Msg: Mapper file "<<MapperFileName<<" is empty..logNormalizer exiting

Fix Msg: check path, file name and/or read write permission

8. Desc Msg: Mapper file "<<MapperFileName<<" has errors.."<<argv[0]<<" exiting

Fix Msg: please check the mapper file errors

9. Desc Msg: Mapping information parsing error for log "<<logName<<" empty information or wrong delimiter used

Fix Msg:

10. Desc Msg: output file "<<outputFileName<<" could not be opened

Fix Msg: No action possible

11. Desc Msg: lostLogFile "<<lostLogFileName<<" could not be opened

Fix Msg: Call Nortel Personal

12. Desc Msg: lostLogFile "<<outputFileName<<" is empty

Fix Msg: Call Nortel Personal

13. Desc Msg: lostLogFormat string is empty

Fix Msg: Call Nortel Personal

14. Desc Msg: lostLogTriggerSize is empty

Fix Msg: Call Nortel Personal

15. Desc Msg: lostLogVisibleMsg string is empty

Fix Msg: Call Nortel Personal

16. Desc Msg: lostLogVisLog string is empty

Fix Msg: Call Nortel Personal

17. Desc Msg: sdmLogList is empty

Fix Msg: Call Nortel Personal

18. Desc Msg: probeTimer string is empty

Fix Msg: No probe is assumed

19. Desc Msg: checkLen string is empty

Fix Msg: No checkLen is assumed

20. Desc Msg: No Lost Log Trigger message has been specified

Fix Msg: Call Nortel Personal

21. Desc Msg: Could not send events to agent. Agent removed from output list.

Fix Msg: No agents connected.. start an agent

22. Desc Msg: Unknown log format. No mapping will be done for input

Fix Msg: Contact Nortel Personal

## 2.2 References

Please refer to the following NTP document for more detailed format of the above logs:

411-8111-511.01.01 : GSM/UMTS VCN OAM Reference Manual







# SN08 Feature Deltas

***Product = IEMS***

## **A00007341--MS2000 IEMS Configuration Integration**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

#### **1.2 Description**

In SN06.2, Nortel made a decision to begin phasing out the UAS (Universal Audio Server) and begin replacing them with a set of Media Server devices, the MS2010 and MS2020. These devices are referred to as MS2000 Series Nodes (Media Server 2000 Series Nodes). In SN06.2 the IP version of the Media Server (MS2010) was deployed. In order to provision and maintain the MS2010 node the MS2000 CLUI (Command Line User Interface) was developed. The MS2000 CLUI ran on the SESM server. In SN08 the MS2000 CLUI was enhanced to handle the provisioning and maintenance of the ATM Media Server (MS2020).

With this feature in SN08, the existing functionality of the MS2000 CLUI will be migrated to reside on the IEMS platform. All of the existing functionality that is captured in the MS2000 CLUI will be migrated to the new MS2000 EM GUI. The existing command line interface will be removed from the SESM software.

##### **1.2.1 MS2000 EM Functionality**

Below is a breakdown of the functionality that is provided by the existing MS2000 CLUI that will be migrated to the MS2000 EM.

##### **1.2.1.1 Configuration**

The following windows will be needed for configuration.

- General Configuration
  - Megaco Call Agent IP Address
  - Is Megaco Call Agent Used
  - Number of Conference Ports
  - Number of TestTrunk Ports
  - Number of Lawful Intercept Ports
  - Number of Announcement Ports
  - APS IP Address
  - Primary Language
  - Secondary Language
- SNMP config (community strings, trusted managers, trap destinations)
- WebServer config (username and password for web interface)
- Network Time Protocol (NTP) settings

The following tables can also be configured for the MS2020 ATM node

- ATM loopback table
- SVC Connection table
- ATM port table
- Remote Gateway table (AAL2 only)
- AAL2 PVC table (AAL2 only)
- SVC Profile table (AAL2 only)

#### **1.2.1.2 Maintenance**

The following maintenance activities will be supported from the client.

- Lock/Unlock of device
- Backup of INI file
- Upload of load files. (CMP, INI, DAT, XML)
- Soft Reset of device

#### **1.2.1.3 User Access Privileges (Authorization)**

The following lays out the access that a user must have to issue the following functions:

**Table 4: User Authorization required for functionality**

| Access                    | Functionality                              |
|---------------------------|--------------------------------------------|
| mg groups with any access | List of any configuration                  |
| mgrw, mgadm               | Change Configuration                       |
| mgmtc, mgrw, mgadm        | Lock/Unlock of device                      |
| mgmtc, mgrw, mgadm        | Backup of INI file                         |
| mgmtc, mgrw, mgadm        | Upload of load files. (CMP, INI, DAT, XML) |
| mgmtc, mgrw, mgadm        | Soft Reset of device                       |
| mgadm, mgrw               | Change SNMP Passwords                      |
| mgadm, mgrw               | Change File Transfer Passwords             |

### 1.2.2 New functionality in SN08

Some new functionality that did not exist on the CLUI will be provided in the SN08 MS2000 EM release. These are briefly outlined below:

- The MS2000 EM will make use of the existing IEMS audit logging functionality to provide a log of what user issued a command against an MS2000 node.
- The MS2000 EM will make use of the existing IEMS alarming system to generate an alarm against the EM whenever a configuration of maintenance action by the EM has an unrecoverable failure.

### 1.2.3 Upgrading SN06.2 and SN08 data

Data that existed in SN06.2 and SN08 on the SESM server will need to be transferred to the SN08 IEMS. The data that needs to be transferred is contained in a properties file.

In SN06.2 the file is:

`/opt/nortel/NTsesm/bin/ams.properties`

In SN08 the file is

`/opt/nortel/NTsesm/bin/ms2000.properties`

Either a manual procedure or a script will be written to help the end user with this data migration. TBD.

### **1.3 Hardware Requirements or Dependencies**

The MS2000 EM will run on IEMS and inherits any requirements and dependencies for hardware.

### **1.4 Software Requirements or Dependencies**

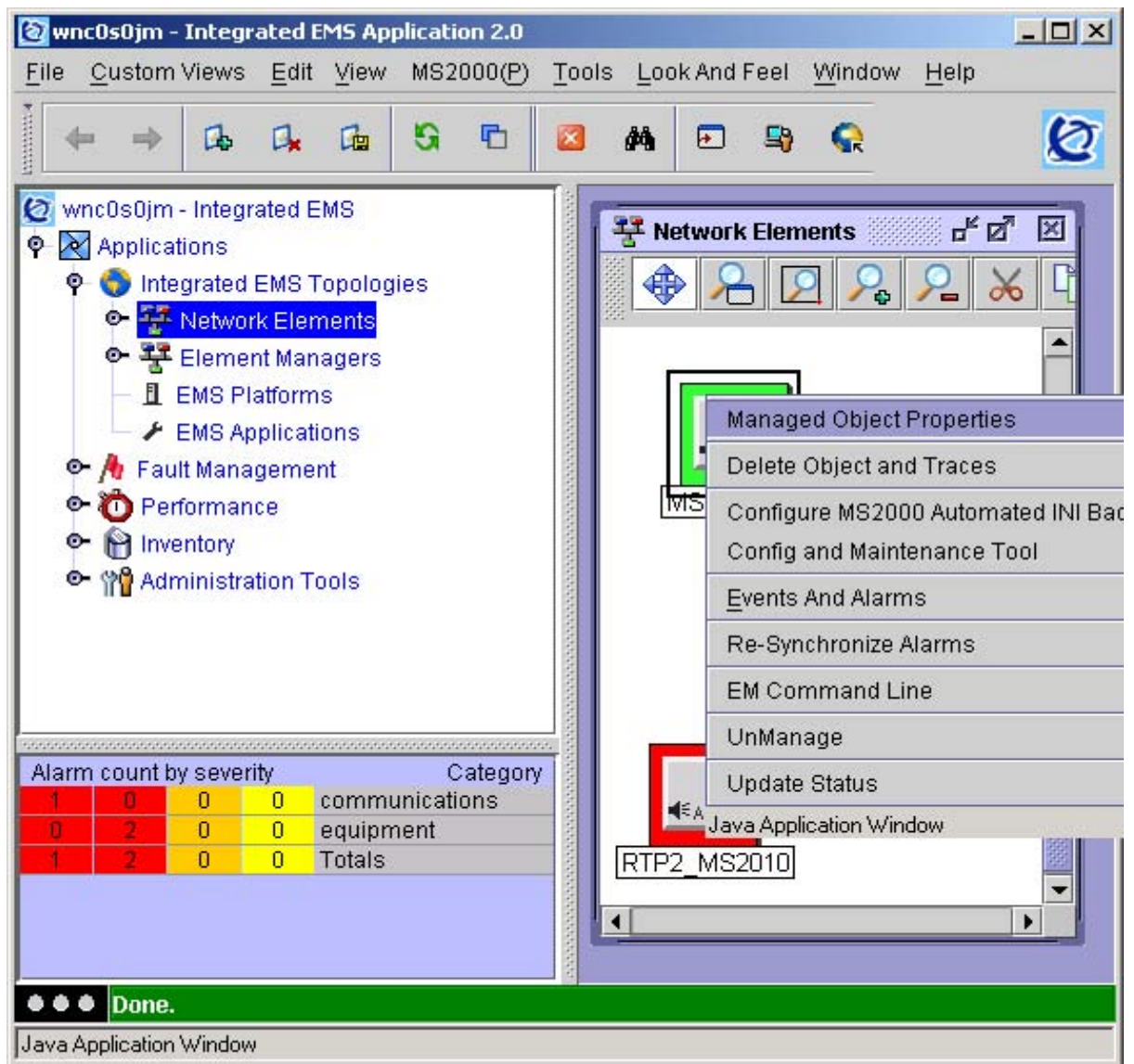
The MS2000 EM will run on IEMS and inherits any requirements and dependencies for software.

### **1.5 Limitations and restrictions**

The existing MS2000 CLUI will be removed from the SESM software and all of its functionality will be migrated to the MS2000 EM.

### **1.6 Interactions**

The MS2000 EM will be built into the IEMS tool such that the EM can be launched by selecting the MS2000 EM from the right click device menu as seen below.



The MS2000 Configuration and Maintenance tool is used to configure and perform some maintenance activities on an MS2010 or MS2020 device. The tool automatically adjusts the display components, behavior, and configuration

options based on the node type (MS2010 or MS2020) and the software version.

The following screen is the display of the tool just after launching. The left hand side displays the Device specific information. The name given in IEMS, the associated IP address entered when the node was added into the system, and the device type (this is determined by querying the MS node).

In the mid section of the left hand side is the Maintenance panel where the following functions can be performed.

- **Soft Reset of the node** - A soft reset of the node is essentially a re-initialization of the software running on the node. For an SN06.2 MS2000 load, only a burn reset was allowed. Starting in SN08 the user could select either to perform a configuration settings burn or to re-initialize with the previous burned settings. When a soft reset is done on the node with the burn option, the existing configuration settings are burned into flash memory and then the node goes through an initialization cycle. This will take the node out of service for a short period of time and will drop any resources in use.
- **Lock/Unlock the node** - The lock function will prevent any audio resources from being allocated on the node. In an SN06.2 MS2000 load, only a graceful lock was supported. A graceful lock will signal to the node that a lock has been requested. This will cause the node to stop allocating new audio resources and will wait for the last resource to be freed before actually locking the node. A force lock will cause the node to immediately free up any resources in use and lock the node.
- **Backup of the INI file** - The initialization file is a configuration data file used by the system to setup the node in event of a reboot. The file contains all of the user defined configuration changes. The tool allows the user to save the initialization file back to the IEMS server or to the tftp server (the SDM or CBM). By saving the INI file back to the IEMS server the user has simply saved a backup copy of the configuration changes for later use. The tool will save up to 5 initialization files for each node, deleting the oldest file once the maximum number of files have been saved. By saving the file to the tftp server, this updates the initialization file that the MS2000 node will retrieve should a hard reset occur. It is recommended that whenever configuration changes are made that the user backup the latest settings in an INI file to the tftp server.

The bottom panel on the main screen shows status logs of the activities that the tool is performing. This provides the user with feedback on what actions have been taken and also displays error when they occur.

**MS2020 Maintenance and Configuration Tool**

Device Name: MS2020\_PV  
IP Address: 47.142.89.60  
Device Type: MS2020

**Maintenance**

☒ Burn Flash  
☐ Don't Burn Flash  
Reset

Lock State: unlocked

☒ Graceful Lock  
☐ Forced Lock  
Lock

☐ Backup INI to IEMS Server  
☒ Backup INI to tftp Server  
INI Backup

**General Configuration** | Load Management | Password

IP Address  
SubNet Address  
Default Gateway  
MG Control Protocol  
Software Version  
Megaco Call Agent IP Address  
Is Megaco Call Agent Used  
Number of Conference Ports  
Number of TestTrunk Ports  
Number of Lawful Intercept Ports  
Number of Announcement Ports  
APS IP Address  
Primary Language  
Secondary Language  
Syslog Server IP  
ATM Default Application Type  
Transmission mode

Save

**Status Logs**

Successfully retrieved trusted managers table for node 47.142.89.60  
Successfully retrieved trap destination table for node 47.142.89.60  
Requesting data for table atmPortLoopbackConfigTable  
Successfully retrieved table data

Close

Java Application Window

On the right hand side of the screen there are a series of tab selected panels for other configuration and maintenance functions that the user can perform.

### **1.6.1 General Configuration**

The first tab is the General Configuration tab where the basic setup of the node is performed. (Please reference the NTP for MS2010 and MS2020 for a complete description of the configuration parameters). The configurable fields have either a pulldown menu for the configuration options or a tooltip displaying the syntax and range of the field. Once the user makes the appropriate changes to the fields they can send the changes to the node by selecting the “SET” button.

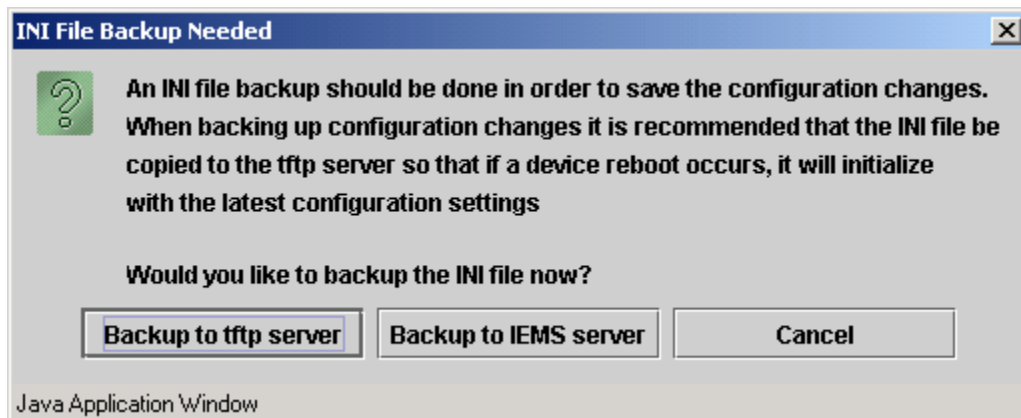


| General Configuration            |                                                        | Load Management | Password Management | SNMP Setup | Atm Configuration |
|----------------------------------|--------------------------------------------------------|-----------------|---------------------|------------|-------------------|
| IP Address                       | <input type="text" value="172.17.40.221"/>             |                 |                     |            |                   |
| SubNet Address                   | <input type="text" value="255.255.248.0"/>             |                 |                     |            |                   |
| Default Gateway                  | <input type="text" value="172.17.40.1"/>               |                 |                     |            |                   |
| MG Control Protocol              | <input type="text" value="controlProtocol-MEGACO(2)"/> |                 |                     |            |                   |
| Software Version                 | <input type="text" value="4.40.9.40"/>                 |                 |                     |            |                   |
| Megaco Call Agent IP Address     | <input type="text" value="172.17.40.68"/>              |                 |                     |            |                   |
| Is Megaco Call Agent Used        | <input type="text" value="yes(1)"/>                    |                 |                     |            |                   |
| Number of Conference Ports       | <input type="text" value="100"/>                       |                 |                     |            |                   |
| Number of TestTrunk Ports        | <input type="text" value="100"/>                       |                 |                     |            |                   |
| Number of Lawful Intercept Ports | <input type="text" value="100"/>                       |                 |                     |            |                   |
| Number of Announcement Ports     | <input type="text" value="180"/>                       |                 |                     |            |                   |
| APS IP Address                   | <input type="text" value="47.142.89.70"/>              |                 |                     |            |                   |
| Primary Language                 | <input type="text" value="isoLangEnglish(2)"/>         |                 |                     |            |                   |
| Secondary Language               | <input type="text" value="isoLangEnglish(2)"/>         |                 |                     |            |                   |
| Syslog Server IP                 | <input type="text" value="47.142.89.27"/>              |                 |                     |            |                   |
| ATM Default Application Type     | <input type="text" value="aal2-i-366-2(2)"/>           |                 |                     |            |                   |
| Transmission mode                | <input type="text" value="sonet(1)"/>                  |                 |                     |            |                   |

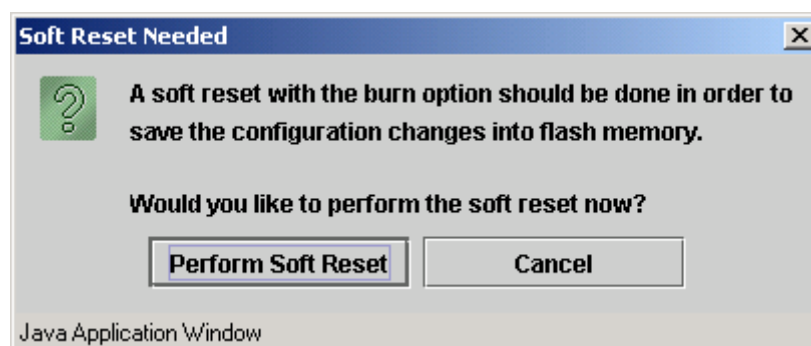
Should the user have entered in invalid data they will be prompted with a warning displaying which data is at issue. Below is an example of this.



Once corrected the user can again attempt to change the data. If successful, then the user will be prompted to save the configuration changes made by backing up the INI file. The user is given the option to either backup to just the IEMS node or to the tftp server.



Once the INI backup has been done the user will be prompted to perform a soft reset on the node in order to burn the configuration changes that were just made into flash.



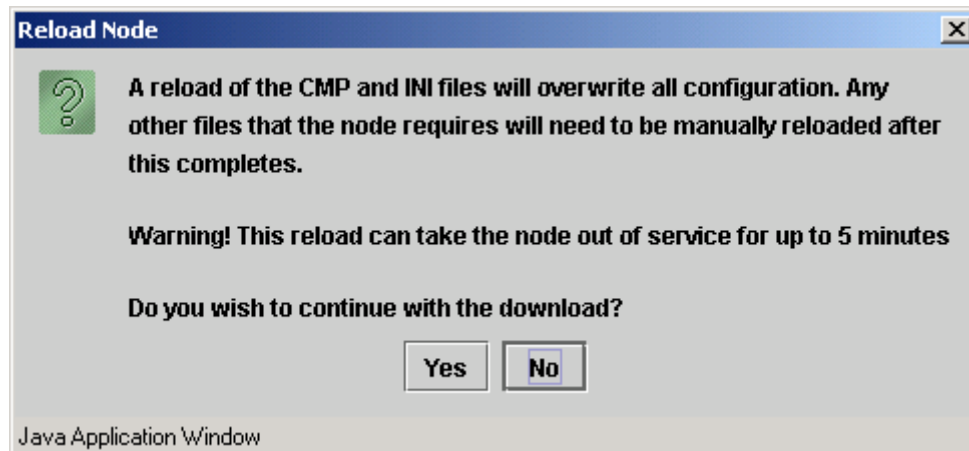
### 1.6.2 Load Management

The MS2000 Configuration and Maintenance tool provides a way for the user to download some of the file types used by the device. The files displayed that can be downloaded must be located on the IEMS server in the /data/loads/audiocodes directory.

The screenshot shows the 'Load Management' tab of the MS2000 Configuration and Maintenance tool. The interface includes a navigation bar with tabs for 'al Configuration', 'Load Management', 'Password Management', 'SNMP Setup', and 'Atrn Configuration'. Below the navigation bar, there are four distinct sections for selecting files to send to the node:

- Section 1:** A heading 'To reload the node select the "CMP" load and "INI" initialization files to send to the node'. It contains two dropdown menus: 'MS2010.cmp' (labeled 'CMP File') and '2004-11-01\_21:35:53.Board.ini' (labeled 'INI File'). A 'Send Files' button is to the right.
- Section 2:** A heading 'Select a "INI" initialization file to send to the node'. It contains a dropdown menu with '2004-11-01\_21:35:53.Board.ini' (labeled 'INI File') and a 'Send File' button.
- Section 3:** A heading 'Select a "DAT" call progress tones file to send to the node'. It contains a dropdown menu with 'usa\_cpt.dat' (labeled 'DAT File') and a 'Send File' button.
- Section 4:** A heading 'Select a "VXML" file to send to the node'. It contains a dropdown menu with 'testtrunk.xml' (labeled 'VXML File') and a 'Send File' button.

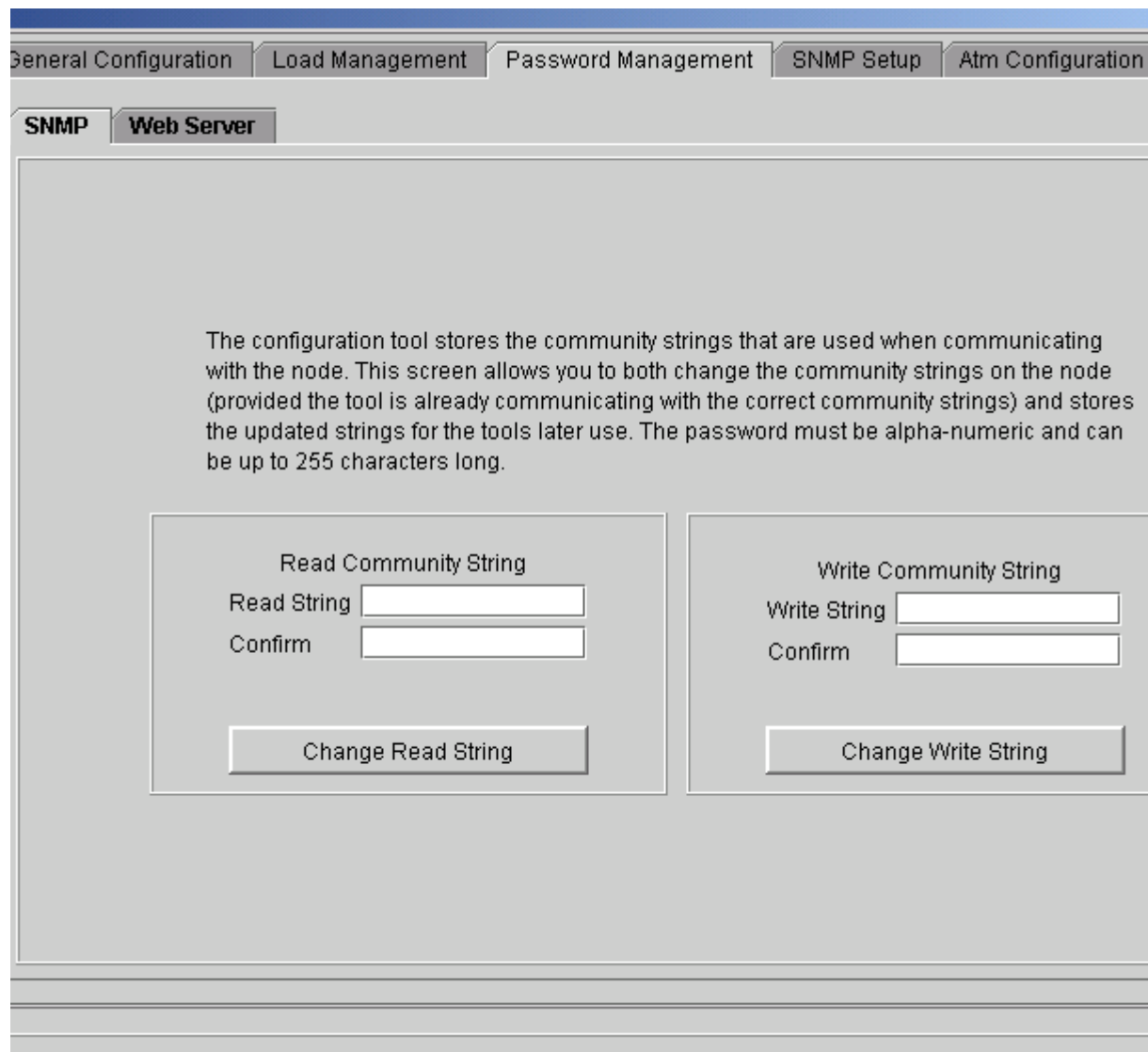
The tool provides the user with a way to remotely reload the device by downloading a CMP load file and an INI initialization file. The following display is shown when a user selects this option:



Similarly, the tool also provides the ability to download other node specific files such as a previously saved INI file (located on the IEMS server in the /data/loads/audiocodes/< node ip>/ directory).

### 1.6.3 Password Management

This panel allows the user to change the passwords on the node. The tool supports changing the SNMP read and write community strings as well as the node's web server username and password. Both of these panels have descriptions of the passwords and what they are used for.



The configuration tool stores the community strings that are used when communicating with the node. This screen allows you to both change the community strings on the node (provided the tool is already communicating with the correct community strings) and stores the updated strings for the tools later use. The password must be alpha-numeric and can be up to 255 characters long.

| SNMP                                                                                                                                                                                                                                                                                                                                                                                                | Web Server                                                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>The configuration tool stores the community strings that are used when communicating with the node. This screen allows you to both change the community strings on the node (provided the tool is already communicating with the correct community strings) and stores the updated strings for the tools later use. The password must be alpha-numeric and can be up to 255 characters long.</p> |                                                                                                                                                                      |
| <p>Read Community String</p> <p>Read String <input type="text"/></p> <p>Confirm <input type="text"/></p> <p><input type="button" value="Change Read String"/></p>                                                                                                                                                                                                                                   | <p>Write Community String</p> <p>Write String <input type="text"/></p> <p>Confirm <input type="text"/></p> <p><input type="button" value="Change Write String"/></p> |

### 1.6.4 SNMP Setup

This panel allows the user to manage the Trusted Managers table and the Trap Destination Table. The node can handle up to 5 entries in each of these tables. Each of these panels has a description of the table and its use.

#### 1.6.4.1 Trusted Managers

A trusted manager is an Element Manager (EM) from which the node accepts SNMP requests. By default, if there are no trusted managers defined then the

node accepts requests from any manager that provides a valid SNMP community string.

Once a single trusted manager is configured, requests from any IP address not in the trusted managers table will be rejected. Because of this the first IP address added to the trusted managers table should be the IP address of the server where this Configuration Tool is running. If it is not then the tool will no longer be able to communicate with the device.

#### **1.6.4.2 Trap Destinations**

The Trap Destination table defines where the node should send it's SNMP traps. Most of the traps originating from the node are alarm related. The node is capable of routing these traps to multiple destinations should the user want the traps logged by different trap collection systems. Only five trap destinations may be defined.

General Configuration Load Management Password Management SNMP Setup Atm Configuration

Trap Destinations Trusted Managers

The Trap Destination table defines where the node should send it's SNMP traps. Most of the traps originating from the node are alarm related. The node is capable of routing these traps to multiple destinations should the user require the traps logged by different trap collection systems. Only five trap destinations may be defined.

|   | Trap Destinations | Port |
|---|-------------------|------|
| 1 | 47.142.89.73      | 162  |
| 2 |                   |      |
| 3 |                   |      |
| 4 |                   |      |
| 5 |                   |      |

Add Delete Refresh

### 1.6.5 ATM Configuration

This tab selection will only appear for MS2020 ATM devices. The number of tables displayed for configuration varies depending on if the MS2020 application type (AAL1 or AAL2). The panels provide both table edit, add, and delete buttons where applicable.

Please refer to the MS2020 NTP for explanation of the various fields in the tables.

General Configuration

Load Management

Password Management

SNMP Setup

Atm Configuration

Atm Port Table

Remote GW Table

AAL2 PVC Table

Svc Profile Table

Port Loopback Table

Service Connection Table

| Port #   | Admin State | Admin Address | Operational State | Operational Addr                          |
|----------|-------------|---------------|-------------------|-------------------------------------------|
| port0(0) | unlocked(2) |               | enabled(1)        | 47525450530000f00000000000000908f04aab300 |

◀

Edit Entry

Refresh Table

## 1.7 Glossary





# SN08 Feature Deltas

*Product = IEMS*

## **A00007343--PP8600 Extended Fault Mapping**

*Functional Description*

### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

### **1.2 Introduction**

This document outlines the proposed implementation details for PP8600 Extended Fault Mapping in IEMS. In pre SN08 a minimal number of PP8600 events were supported in IEMS. All other events received from the PP8600 device were mapped as IEMS 602 “unknown” events.

This feature is to extend the PP8600 logs in IEMS to be transparent with the pre SN08 MDM implementation so that customers with previously deployed PP8600s that feed through MDM to SDM will have transparent cutover/migration to IEMS managed PP8600s.

### **1.3 Hardware Requirements or Dependencies**

Not applicable.

### **1.4 Software Requirements or Dependencies**

IEMS must have the relevant MIBs from the PP8600. This is expected to be 3.7.x.

### **1.5 Limitations and restrictions**

Because this feature is intended to mirror the behavior of the MDM-SDM system, fault codes etc. will be used in accordance with previously decided conventions and values.

### **1.6 Interactions**

The log format will change for all PP8600 originated logs.

### 1.6.1 Example old log (pre-SN08)

MYOFFICE \*\* PP398 SEP23 14:16:46 2572 TBL PP Fault  
Location: 10.102.15.130  
State: Raise  
Specific Problem: Generic Link Status  
Description: Link Down: ifIndex = 267 ( AdminStatus = up OpeationStatus = down )

MYOFFICE PP399 SEP23 14:16:47 2577 INFO PP Fault  
Location: 10.102.15.130  
State: Clear  
Specific Problem: Generic Link Status  
Description: Link Up: ifIndex = 267 ( AdminStatus = up OpeationStatus = up )

### 1.6.2 Example new log (SN08+)

MY\_OFFICE \*\* PP317 AUG09 16:06:59 0012 TBL PP Fault  
Location: pp8600;47.142.106.1  
State: Raised  
Category: communications  
Cause: loss of communication  
Time: Aug 09 16:06:59 2004  
Component ID: PP8600=47.142.106.1; ifIndex=89  
Specific Problem: Generic Link Status  
Description: Link Down: ifIndex = 89( AdminStatus = down OperationStatus = down)  
.1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.3.0  
.1.3.6.1.2.1.1.3.0: 50 days, 17 hours, 12 minutes, 24 seconds.

MY\_OFFICE PP318 AUG09 16:08:05 0013 INFO PP Fault  
Location: pp8600;47.142.106.1  
State: Cleared  
Category: communications  
Cause: communication regained  
Time: Aug 09 16:08:05 2004  
Component ID: PP8600=47.142.106.1; ifIndex=89  
Specific Problem: Generic Link Status  
Description: Link Up: ifIndex = 89( AdminStatus = up OperationStatus = up)  
.1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.4.0  
.1.3.6.1.2.1.1.3.0: 50 days, 17 hours, 13 minutes, 30 seconds.

### 1.6.3 1.6.3 Trap to Fault Code Mapping

| Trap Name                  | OID                        | Fault Code | Severity                    | Log Name | Log Num |
|----------------------------|----------------------------|------------|-----------------------------|----------|---------|
| risingAlarm                | 1.3.6.1.2.1.16.0.1         | S C1220008 | minor                       | PP       | 310     |
| fallingAlarm               | 1.3.6.1.2.1.16.0.2         | S C1220008 | cleared                     | PP       | 311     |
| Default Trap               | DEFAULT                    | S C1229999 | indeterminate               | PP       | 312     |
| coldStart                  | 1.3.6.1.6.3.1.1.5.1.0      | S C0000000 | cleared                     | PP       | 313     |
| warmStart                  | 1.3.6.1.6.3.1.1.5.2.0      | S C0000001 | cleared                     | PP       | 315     |
| linkDown                   | 1.3.6.1.6.3.1.1.5.3.0      | S C0000002 | major                       | PP       | 317     |
| linkUp                     | 1.3.6.1.6.3.1.1.5.4.0      | S C0000002 | cleared                     | PP       | 318     |
| authenticationFailure      | 1.3.6.1.6.3.1.1.5.5.0      | S C0000004 | warning                     | PP       | 319     |
| rcnChasPowerSupplyDown     | 1.3.6.1.4.1.2272.1.21.0.6  |            | critical                    | PP       | 322     |
| rcnChasPowerSupplyUp       | 1.3.6.1.4.1.2272.1.21.0.14 | S C1220007 | cleared                     | PP       | 323     |
| rcnChasFanDown             | 1.3.6.1.4.1.2272.1.21.0.7  |            | critical                    | PP       | 324     |
| rcnChasFanUp               | 1.3.6.1.4.1.2272.1.21.0.21 | S C1220006 | cleared                     | PP       | 325     |
| rcn2kCardDown              | 1.3.6.1.4.1.2272.1.21.0.11 | S C1220001 | major                       | PP       | 326     |
| rcn2kCardUp                | 1.3.6.1.4.1.2272.1.21.0.12 | S C1220001 | cleared                     | PP       | 327     |
| rcn2kTemperature           | 1.3.6.1.4.1.2272.1.21.0.13 | S C1220003 | critical                    | PP       | 328     |
| rcnErrorNotification       | 1.3.6.1.4.1.2272.1.21.0.3  |            | warning, major, critical    | PP       | 329     |
| rcnLinkOscillation         | 1.3.6.1.4.1.2272.1.21.0.8  |            | major                       | PP       | 330     |
| rcnMacViolation            | 1.3.6.1.4.1.2272.1.21.0.9  |            | warning                     | PP       | 331     |
| rcnSonetTrap               | 1.3.6.1.4.1.2272.1.21.0.10 | S C1220051 | warning                     | PP       | 332     |
| rcnStpNewRoot              | 1.3.6.1.4.1.2272.1.21.0.4  |            | warning                     | PP       | 333     |
| rcnStpTopologyChange       | 1.3.6.1.4.1.2272.1.21.0.5  |            | warning                     | PP       | 334     |
| rcnStpTCN                  | 1.3.6.1.4.1.2272.1.21.0.16 | S C1220017 | warning                     | PP       | 335     |
| rcn2kAtmPvcLinkStateChange | 1.3.6.1.4.1.2272.1.21.0.15 | S C1220012 | indeterminate, minor, major | PP       | 336     |
| rcnSmlt1stLinkUp           | 1.3.6.1.4.1.2272.1.21.0.17 | S C1220014 | cleared                     | PP       | 337     |
| rcnSmlt1stLinkDown         | 1.3.6.1.4.1.2272.1.21.0.18 | S C1220014 | major                       | PP       | 338     |
| rcnSmltLinkUp              | 1.3.6.1.4.1.2272.1.21.0.19 | S C1220020 | cleared                     | PP       | 339     |
| rcnSmltLinkDown            | 1.3.6.1.4.1.2272.1.21.0.20 | S C1220020 | major                       | PP       | 340     |
| rcnPasswordChange          | 1.3.6.1.4.1.2272.1.21.0.22 | S C1220022 | warning                     | PP       | 341     |
| rcnPcmciaCardRemoved       | 1.3.6.1.4.1.2272.1.21.0.25 | S C1220049 | warning                     | PP       | 342     |
| rcnSmartCpldTimerFired     | 1.3.6.1.4.1.2272.1.21.0.26 | S C1220024 | major                       | PP       | 343     |
| rcnCardCpldNotUpDate       | 1.3.6.1.4.1.2272.1.21.0.27 | S C1220025 | warning                     | PP       | 344     |
| rcnlgapLogFileFull         | 1.3.6.1.4.1.2272.1.21.0.28 | S C1220026 | major                       | PP       | 345     |
| rcnCpLimitShutDown         | 1.3.6.1.4.1.2272.1.21.0.29 | S C1220027 | major                       | PP       | 346     |
| rcnSshServerEnabled        | 1.3.6.1.4.1.2272.1.21.0.30 | S C1220028 | cleared                     | PP       | 347     |
| rcnSshServerDisabled       | 1.3.6.1.4.1.2272.1.21.0.31 | S C1220028 | major                       | PP       | 348     |
| rcnSshSessionLogin         | 1.3.6.1.4.1.2272.1.21.0.32 | S C1220029 | cleared                     | PP       | 349     |
| rcnSshSessionLogout        | 1.3.6.1.4.1.2272.1.21.0.33 | S C1220029 | major                       | PP       | 350     |

|                          |                              |            |                 |    |     |
|--------------------------|------------------------------|------------|-----------------|----|-----|
| rcnSshUnauthorizedAccess | 1.3.6.1.4.1.2272.1.21.0.34   | S C1220030 | major           | PP | 351 |
| rcnHaCpuState            | 1.3.6.1.4.1.2272.1.21.0.35   | S C1220031 | warning         | PP | 352 |
| rcnInsufficientMemory    | 1.3.6.1.4.1.2272.1.21.0.36   | S C1220032 | warning         | PP | 353 |
| rcnSaveConfigAction      | 1.3.6.1.4.1.2272.1.21.0.37   | S C1220033 | indeterminate   | PP | 354 |
| rcnLoopDetectOnPort      | 1.3.6.1.4.1.2272.1.21.0.38   | S C1220034 | warning         | PP | 355 |
| vrrpTrapStateTransition  | 1.3.6.1.2.1.46.1.3.0.3.0     | S C1220048 | warning         | PP | 356 |
| rcnEmError               | 1.3.6.1.4.1.2272.1.21.0.23   | S C1220023 | warning         | PP | 357 |
| ospfVirtIfStateChange    | 1.3.6.1.2.1.14.16.2.1        | S C1220015 | warning,cleared | PP | 358 |
| ospfNbrStateChange       | 1.3.6.1.2.1.14.16.2.2        | S C1220011 | warning,cleared | PP | 359 |
| ospfVirtNbrStateChange   | 1.3.6.1.2.1.14.16.2.3        | S C1220016 | minor,cleared   | PP | 360 |
| ospfIfConfigError        | 1.3.6.1.2.1.14.16.2.4        | S C122000F | major           | PP | 361 |
| ospfVirtIfConfigError    | 1.3.6.1.2.1.14.16.2.5        | S C1220021 | major           | PP | 362 |
| ospfIfAuthFailure        | 1.3.6.1.2.1.14.16.2.6        | S C122000E | major           | PP | 363 |
| ospfVirtIfAuthFailure    | 1.3.6.1.2.1.14.16.2.7        | S C1220013 | major           | PP | 364 |
| ospfIfStateChange        | 1.3.6.1.2.1.14.16.2.16       | S C1220010 | warning,cleared | PP | 365 |
| rcnCardDown              | 1.3.6.1.4.1.2272.1.21.0.1    |            | major           | PP | 366 |
| rcnCardUp                | 1.3.6.1.4.1.2272.1.21.0.2    |            | cleared         | PP | 367 |
| rcnbgpEstablished        | 1.3.6.1.4.1.2272.1.21.0.39   | S C1220039 | cleared         | PP | 368 |
| rcnbgpBackwardTransition | 1.3.6.1.4.1.2272.1.21.0.40   | S C1220040 | cleared         | PP | 369 |
| rcnAggLinkUp             | 1.3.6.1.4.1.2272.1.21.0.41   | S C1220041 | cleared         | PP | 370 |
| rcnAggLinkDown           | 1.3.6.1.4.1.2272.1.21.0.42   | S C1220041 | cleared         | PP | 371 |
| rcnlgmpNewGroupMember    | 1.3.6.1.4.1.2272.1.21.0.43   | S C1220042 | cleared         | PP | 372 |
| rcnlgmpLossGroupMember   | 1.3.6.1.4.1.2272.1.21.0.44   | S C1220042 | cleared         | PP | 373 |
| rcnlgmpNewQuerier        | 1.3.6.1.4.1.2272.1.21.0.45   | S C1220043 | cleared         | PP | 374 |
| rcnlgmpQuerierChange     | 1.3.6.1.4.1.2272.1.21.0.46   | S C1220044 | cleared         | PP | 375 |
| rcnDvmrplfStateChange    | 1.3.6.1.4.1.2272.1.21.0.47   | S C1220045 | cleared         | PP | 376 |
| rcnDvmrpNewNbrChange     | 1.3.6.1.4.1.2272.1.21.0.48   | S C1220046 | cleared         | PP | 377 |
| rcnDvmrpNbrLossChange    | 1.3.6.1.4.1.2272.1.21.0.49   | S C1220046 | cleared         | PP | 378 |
| rcnFdbProtectViolation   | 1.3.6.1.4.1.2272.1.21.0.59   | S C1220047 | cleared         | PP | 379 |
| rcnLogMsgControl         | 1.3.6.1.4.1.2272.1.21.0.60   | S C1220050 | cleared         | PP | 380 |
| rcnSaveConfigFile        | 1.3.6.1.4.1.2272.1.21.0.61   | S C1220052 | cleared         | PP | 381 |
| rcnDNSRequestResponse    | 1.3.6.1.4.1.2272.1.21.0.62   | S C1220057 | cleared         | PP | 382 |
| pingProbeFailed          | 1.3.6.1.2.1.80.0.1           | S C1220053 | cleared         | PP | 383 |
| pingTestFailed           | 1.3.6.1.2.1.80.0.2           | S C1220054 | cleared         | PP | 384 |
| pingTestCompleted        | 1.3.6.1.2.1.80.0.3           | S C1220054 | cleared         | PP | 385 |
| traceRoutePathChange     | 1.3.6.1.2.1.81.0.1.0         | S C1220055 | cleared         | PP | 386 |
| traceRouteTestFailed     | 1.3.6.1.2.1.81.0.2           | S C1220056 | cleared         | PP | 387 |
| traceRouteTestComplete   | 1.3.6.1.2.1.81.0.3           | S C1220056 | cleared         | PP | 388 |
| UDPEapSessionEndTrap     | 1.3.6.1.4.1.562.42.5.1.3.2.2 |            | cleared         | PP | 389 |
| UDPEapSessionStartTrap   | 1.3.6.1.4.1.562.42.5.1.3.2.1 |            | cleared         | PP | 390 |

## 1.7 Description

IEMS needs to support all the events indicated in the above table. As it is required to support such an extensive number of events, it is proposed that the Event mapping details be maintained in XML format in the IEMS server side. This will also provide additional flexibility in supporting any further events.

### 1.7.1 Implementation Details

Processing that occurs the IEMS in order to map the events received from the PP8600 device are detailed below:

- 1 The IEMS server, on addition of the first PP8600 device, initializes the event mapping details by reading them from the XML.
- 2 On receipt of an event from the PP8600 device, the event mapping details are retrieved based on the OID received in the trap.
- 3 Log/Alarm is generated by IEMS based on the event mapping details.

### 1.7.2 Proposed Format for persisting Event Mapping in XML

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<TRAPS>
  <TRAP
    oid = ".1.3.6.1.4.1.2272.1.21.0.11"
    name = "rcn2kCardDown"
    severity = "2"
    logName = "PP"
    logNumber = "326"
    eventType = "TBL"
    eventLabel = "PP Fault"
    category = "equipment"
    entity = "$ip_2KCardStatus"
    componentID="cardIndex=$1"
    alarmClear = "3"
    probableCause=" "
    description= "Card Down: cardIndex = $1( AdminStatus = $2 OperationStatus = $3)"
    specificProblem value = "RC 2K Card Status" >
      <VARBINDS>
        <varbind name = ".1.3.6.1.4.1.2272.1.4.9.1.1.1" property = "$1"/>
        <varbind name = ".1.3.6.1.4.1.2272.1.4.9.1.1.5" property = "$2"/>
        <varbind name = ".1.3.6.1.4.1.2272.1.4.9.1.1.6" property = "$3"/>
      </VARBINDS>
    </TRAP>
  </TRAPS>
```

## 1.8 Glossary

| Term   | Description                          |
|--------|--------------------------------------|
| IEMS   | Integrated Element Management System |
| PP8600 | PassPort 8600                        |

***Product = IEMS***

## **A00007344--IEMS Robustness/Southbound Event Throttling** ***Functional Description***

### 1.1 Applicable Solution(s)

UA-IP

### 1.2 Introduction to OMs

This document brings out the various Operational Measurements of IEMS. These measurements greatly help the craft person in monitoring and maintaining the IEMS, as it being the heart of managing the succession network.

### 1.3 High Level Design

The following table lists out the OMs that are to be collected by the IEMS. A separate MIB (IEMS OM MIB) will be defined for capturing all these OMs. Users can create templates by loading the IEMS OM MIB (Reusing the existing performance UI) and a Job can be created for periodically collecting the data. All these are done over the existing IEMS performance collection framework. These collected data will be transferred to the OSS in XML or CSV format. No SNMP Agent Implementation will be provided for querying these data as of now).

**IEMS Operational Measurements:**

| Collection Attribute Name | Value<br>reset<br>for next<br>collect.<br>interval | Comments |
|---------------------------|----------------------------------------------------|----------|
| database                  |                                                    |          |

|                                                                                                                        |     |                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| usedTableSpaceInBytes                                                                                                  | No  |                                                                                                                                                                                                                                                        |
| usedTableSpaceInPercent                                                                                                | No  |                                                                                                                                                                                                                                                        |
| numOfTableCleanUpPolicyExecutions                                                                                      | Yes |                                                                                                                                                                                                                                                        |
| <b>fault/events</b>                                                                                                    |     |                                                                                                                                                                                                                                                        |
| numOfEvents                                                                                                            | No  |                                                                                                                                                                                                                                                        |
| numOfEventsFromUnknownCustlogDevices                                                                                   | Yes |                                                                                                                                                                                                                                                        |
| numOfEventsFromUnknownSNMPDevices                                                                                      | Yes |                                                                                                                                                                                                                                                        |
| numOfEventsFromUnknownDevices                                                                                          | Yes |                                                                                                                                                                                                                                                        |
| numOfDiscardedEvents                                                                                                   | Yes |                                                                                                                                                                                                                                                        |
| numOfEventsAdded                                                                                                       | Yes |                                                                                                                                                                                                                                                        |
| eventQueueSize                                                                                                         | No  |                                                                                                                                                                                                                                                        |
| avgEventThroughputRate                                                                                                 | Yes |                                                                                                                                                                                                                                                        |
| maxEventThroughputRate                                                                                                 | Yes | Sample Period can be configurable                                                                                                                                                                                                                      |
| DeviceEventRateTable<br><br>This table will have the following Columns<br><br>ID<br>DeviceName<br>EventRate per Second | Yes | Events from Unprovisioned Devices will also be taken into account. This will be done at the level of Protocol, not at the level of device. i.e Entries will be there for SysLog and SNMP Protocols but not at the level of each SysLog and SNMP Device |
| <b>fault/alarms</b>                                                                                                    |     |                                                                                                                                                                                                                                                        |
| numOfActiveAlarms                                                                                                      | No  |                                                                                                                                                                                                                                                        |
| numOfCriticalAlarms                                                                                                    | No  |                                                                                                                                                                                                                                                        |
| numOfMajorAlarms                                                                                                       | No  |                                                                                                                                                                                                                                                        |
| numOfMinorAlarms                                                                                                       | No  |                                                                                                                                                                                                                                                        |
| nmOfWarningAlarms                                                                                                      | No  |                                                                                                                                                                                                                                                        |
| numOfAlarmsCleared                                                                                                     | Yes |                                                                                                                                                                                                                                                        |
| numOfAlarmsAdded                                                                                                       | Yes |                                                                                                                                                                                                                                                        |
| <b>performance</b>                                                                                                     |     |                                                                                                                                                                                                                                                        |
| numOfCollectionJobsProvisioned                                                                                         | Yes |                                                                                                                                                                                                                                                        |

|                                                     |     |  |
|-----------------------------------------------------|-----|--|
| numOfReportJobsProvisioned                          | Yes |  |
| numOfFailedReportJobs                               | Yes |  |
| numOfTransferJobProvisioned                         | Yes |  |
| numOfAttributesCollected                            | No  |  |
| numOfAttributesCollectedOverPreviousInterval        | Yes |  |
| <b>performance/SuccessfulCollection Jobs</b>        |     |  |
| numOf5MinSuccessfulJobs                             | Yes |  |
| numOf15MinSuccessfulJobs                            | Yes |  |
| numOf30MinSuccessfulJobs                            | Yes |  |
| numOf60MinSuccessfulJobs                            | Yes |  |
| numOf12HrSuccessfulJobs                             | Yes |  |
| numOf24HrSuccessfulJobs                             | Yes |  |
| <b>performance/PartialSuccessfulCollection Jobs</b> |     |  |
| numOf5MinPartialSuccessfulJobs                      | Yes |  |
| numOf15MinPartialSuccessfulJobs                     | Yes |  |
| numOf30MinPartialSuccessfulJobs                     | Yes |  |
| numOf60MinPartialSuccessfulJobs                     | Yes |  |
| numOf12HrPartialSuccessfulJobs                      | Yes |  |
| numOf24HrPartialSuccessfulJobs                      | Yes |  |
| <b>performance/FailedCollection Jobs</b>            |     |  |
| numOf5MinFailedJobs                                 | Yes |  |
| numOf15MinFailedJobs                                | Yes |  |
| numOf30MinFailedJobs                                | Yes |  |
| numOf60MinFailedJobs                                | Yes |  |
| numOf12HrFailedJobs                                 | Yes |  |
| numOf24HrFailedJobs                                 | Yes |  |
| <b>performance/collectionJobTable</b>               |     |  |



|                                            |     |                                               |
|--------------------------------------------|-----|-----------------------------------------------|
| 5MinCollectionJobTable                     | Yes | Number of Jobs to include can be configurable |
| This table will have the following columns |     |                                               |
| ID                                         |     |                                               |
| JobName                                    |     |                                               |
| Start Time                                 |     |                                               |
| Execution Time                             |     |                                               |
| 15MinCollectionJobTable                    | Yes | Number of Jobs to include can be configurable |
| 30MinCollectionJobTable                    | Yes | Number of Jobs to include can be configurable |
| 60MinCollectionJobTable                    | Yes | Number of Jobs to include can be configurable |
| <b>performance/reportJobTable</b>          |     |                                               |
| 5MinReportJobTable                         | Yes | Number of Jobs to include can be configurable |
| 15MinReportJobTable                        | Yes | Number of Jobs to include can be configurable |
| 30MinReportJobTable                        | Yes | Number of Jobs to include can be configurable |
| 60MinReportJobTable                        | Yes | Number of Jobs to include can be configurable |
| <b>performance/failedTransfer Jobs</b>     |     |                                               |
| numOf5MinFailedJobs                        | Yes |                                               |
| numOf15MinFailedJobs                       | Yes |                                               |
| numOf30MinFailedJobs                       | Yes |                                               |
| numOf60MinFailedJobs                       | Yes |                                               |
| numOf12HrFailedJobs                        | Yes |                                               |
| numOf24HrFailedJobs                        | Yes |                                               |
| <b>performance/transfer JobTable</b>       |     |                                               |
| 5MinTransferJobTable                       | Yes | Number of Jobs to include can be configurable |
| 15MinTransferJobTable                      | Yes | Number of Jobs to include can be configurable |

|                                        |     |                                                                                                                                |
|----------------------------------------|-----|--------------------------------------------------------------------------------------------------------------------------------|
| 30MinTransferJobTable                  | Yes | Number of Jobs to include can be configurable                                                                                  |
| 60MinTransferJobTable                  | Yes | Number of Jobs to include can be configurable                                                                                  |
| <b>topology</b>                        |     |                                                                                                                                |
| numOfManagedObjects                    | No  |                                                                                                                                |
| numOfAddedManagedObjects               | Yes |                                                                                                                                |
| numOfDeletedManagedObjects             | Yes |                                                                                                                                |
| numOfThrottledDevices                  | No  |                                                                                                                                |
| numOfUnManagedDevices                  | No  |                                                                                                                                |
| numOfUnknownDevices                    | No  |                                                                                                                                |
| <b>client</b>                          |     |                                                                                                                                |
| numOfActiveClients                     | Yes | Includes both JAVA and HTML Clients.                                                                                           |
| numOfSuccessfulLogins                  | Yes | Includes both JAVA and HTML Clients.<br><br>APIs are needed from MFT, as authentication is not carried out by the IEMS Server. |
| numOfFailedLoginAttempts               | Yes | Includes both JAVA and HTML Clients.<br><br>APIs are needed from MFT, as authentication is not carried out by the IEMS Server. |
| <b>applicationMemory</b>               |     |                                                                                                                                |
| applicationHeapSize                    | No  |                                                                                                                                |
| maxApplicationHeapSizeInAGivenInterval | No  | Sample Period can be configurable                                                                                              |
| <b>system</b>                          |     |                                                                                                                                |
| systemRestartCount                     | No  | Value will be Reset after Software Upgrade                                                                                     |

### 1.2.1 OM Configurations & Table Definitions

| JobConfigurationTable |                                                                         |           |                |               |                     |
|-----------------------|-------------------------------------------------------------------------|-----------|----------------|---------------|---------------------|
| Attribute Name        | Attribute Description                                                   | Data Type | Allowed Values | Default Value | Optional/ Mandatory |
| <b>ID</b>             | ID which is internally generated as and when a row is getting inserted. | Integer   |                |               | Mandatory           |
| NUMOFJOBS             | Number of longest duration jobs to be collected..                       | Integer   |                |               | Mandatory           |

## 1.4 IEMS Overload Control

This functionality is aimed at reducing the impact on the IEMS when event/message rate from devices exceeds the support/affordable rate. Since IEMS plays a prominent role in managing the succession network, it should be protected from such unusual message rates. This document brings out the design for achieving the same.

### 1.4.1 High Level Design

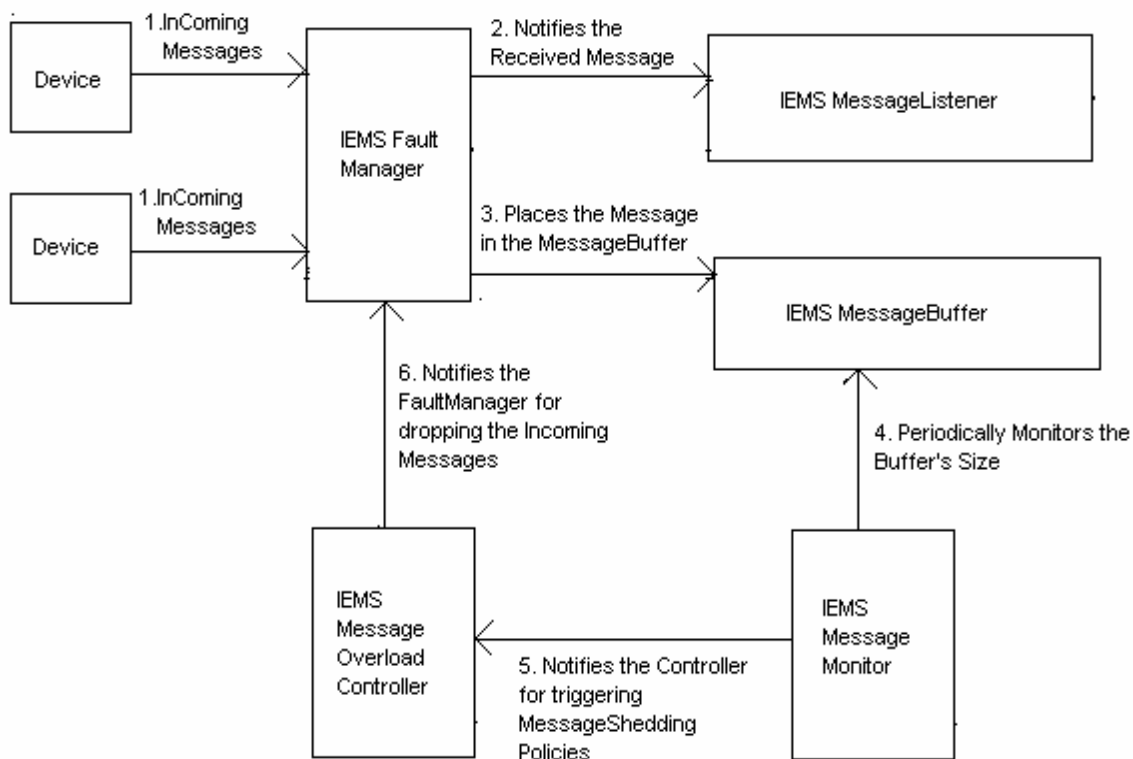
One of the ways of controlling the IEMS overload is by constantly monitoring the Event Streams of managed devices.( i.e for identifying the rouge devices). This can be achieved by implementing the following items.

- Component that monitors the message buffer size of the IEMS. This monitoring of message buffer will be done for every “n” events. (This number “n” can be configured).
- Component that captures the incoming rates of different devices/EMS, which is used by the system for identifying event babblers.
- Component that applies Event Shedding Policies for protecting the IEMS
  - Throttled State
    - Dropping the Events from UnProvisioned Devices(i.e. Devices not managed by the System)
    - Identifying the top fault interfaces
    - UnManaging and Changing the System's State to “Throttled”.
    - Generating Alarms to indicate the “Throttled” State
    - Dropping the incoming events received from this device

- Changing the device's state to Manage after a specified timeout
- UnManaged State
  - Changing the device state to “UnManage” if the device is in a Throttled State for a specified number of times. (This number can be configured)
  - Generating Alarms to indicate the “UnManaged” State

### 1.4.2 Low Level Design

Below diagram depicts the *important* sequence of events while monitoring and controlling the incoming messages to the IEMS.



( IEMS MessageOverload Controller uses the data maintained by the IEMS MessageListener, for determining the top fault interfaces of IEMS System )

### 1.4.3 IEMS MessageListener

This component (part of IEMS Fault Manager) listens for the incoming messages (for identifying top fault interfaces) of the various devices managed by the IEMS. Whenever an event is received by the IEMS, IEMS Message

Listener will be notified about this event. This component just have a count on the number of events received for a specific device. No Time consuming work will be handled in this component as it may affect the EventProcessing rate of the IEMS.

#### 1.4.4 IEMS MessageBufferMonitor

This component periodically monitors the message buffer of IEMS for every “n” events. A separate configuration that captures the following details will be defined for triggering the Message Shedding Policies.

- EnableMessageOverloadControl.
  - Boolean Value that decides whether incoming messages to the IEMS need to be monitored or not. i.e OverloadControl should be enabled or not.
- AcceptableEventBufferSize
  - Int Value representing the max number of messages in the buffer that IEMS can handle.
- MessageMonitorCount
  - Int Value representing the number of messages to be received by the IEMS before checking the buffer size of the IEMS. i.e checking the Message Buffer for every “n” messages.
- ThrottleStatePeriod
  - Time in MillisSeconds that a ManagedObject(MO) will be placed be in the Throttle State. After the ThrottleStatePeriod, the IEMS automatically switches the MO back to the Managed State.
- ThrottleStateCount
  - Int Value that represents the max number of times, a Managed Object will be put in the Throttle State. Afterwards the IEMS automatically makes the MO to “System UnManaged” state.

If the Message Buffer Size exceeds the given max value (at the end of a given message count), it notifies the IEMS MessageOverload Controller to take corrective actions like triggering of Message Shedding Policies.

#### 1.4.5 IEMS MessageOverloadController

This component triggers message shedding policies like shutting down of the fault interfaces having high message incoming rates, preventing IEMS from storing events from the unprovisioned devices etc. (It uses the data maintained by the IEMS EventListener for identifying the top fault interfaces Identifying top fault interfaces is done by taking average incoming message rate for each

device.) After a specified timeout, it also take actions for receiving messages from devices, that are being identified as rogue previously.

#### 1.4.6 New Fields in Managed Object

**FISState** (FaultInterface State) - String or Integer that captures the exact state of the Device.

- Normal
- Throttle UnManage
- System UnManage

| <i>Manage/<br/>UnManage<br/>State</i> | <i>FaultInterface<br/>State</i> | <i>Comments</i>                                                                                                                                                                                                                                                   |
|---------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Manage                                | Normal                          | Indicates normal functioning of the device.                                                                                                                                                                                                                       |
| UnManage                              | Normal                          | Indicates the Unmanage State of the device, which is being triggered by the User, but the device may be functioning normally.                                                                                                                                     |
| UnManage                              | Throttled                       | Indicates the Unmanage State of the device, which is being triggered by the IEMS Overload Controller.                                                                                                                                                             |
| UnManage                              | UnManage                        | Indicates the Unmanage State of the device, which is being triggered by the IEMS Overload Controller, as the device is behaving as a rogue.<br><br>This value will be automatically updated to "Normal" if the User updates the status of the device to "Manage". |

**UnManage** - Boolean Value that captures whether IEMS is allowed to change the MO's state from "Throttled" to "UnManaged".

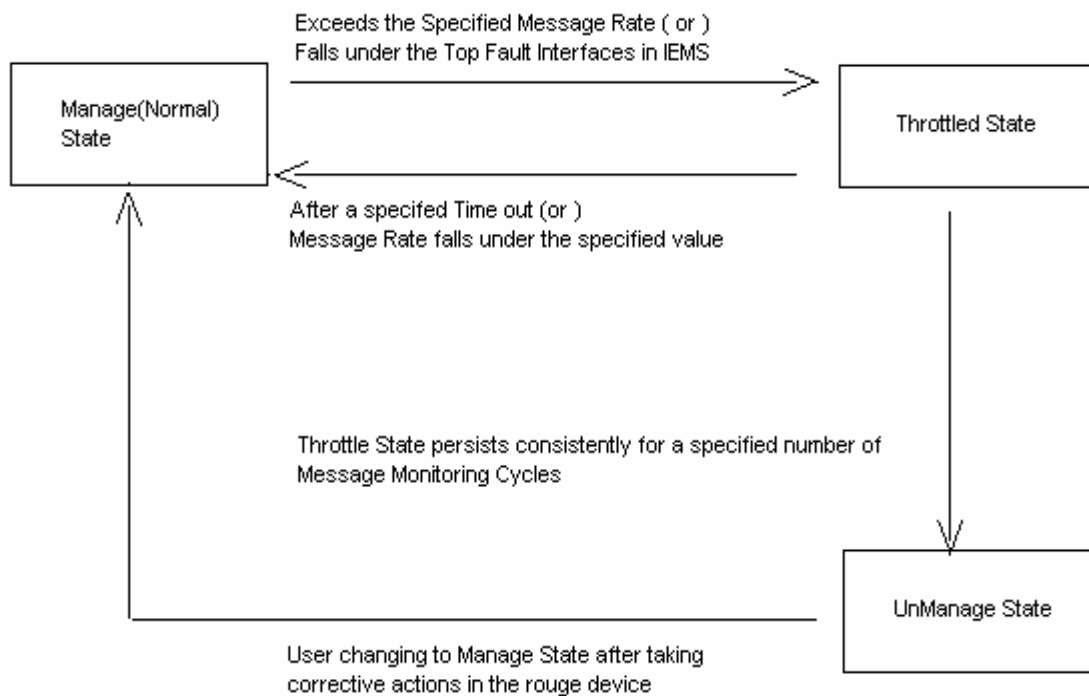
#### 1.4.7 Table Definitions

Name: **MessageOverloadControlConfiguration**

| Column Name | Data Type | Allowed Values | Default Values | Optional/<br>Mandatory |
|-------------|-----------|----------------|----------------|------------------------|
| MOCID       | Integer   |                | 1              | Mandatory              |

|                                 |         |        |      |           |
|---------------------------------|---------|--------|------|-----------|
| ENABLE MESSAGE OVERLOAD CONTROL | Integer | 0 or 1 |      | Mandatory |
| MESSAGE_BUFFER_SIZE             | Integer |        | 500  | Mandatory |
| MESSAGE_MONITOR_COUNT           | Integer |        | 1000 | Mandatory |
| THROTTLE_STATE_PERIOD           | Integer |        | 5000 | Mandatory |
| THROTTLE_STATE_COUNT            | Integer |        | 3    | Mandatory |

State Diagram that depicts the various states of a ManagedObject



***Product = IEMS***

**A00007345--MDM Enhancements for IEMS**

## ***Functional Description***

### **1.1 Applicable Solution(s)**

UA-IP

### **1.2 Introduction**

This document presents the functional specification for the new enhancements to be done for the Preside MDM 8.0 in SN08.

### **1.3 Descriptions**

#### **1.3.1 Auto Discovery of Client set and Server set platforms**

In SN08, the client sets and the server sets platforms will be automatically discovered when the Preside MDM 8.0 is added. IEMS discovers the client sets and the server sets platforms with the help of the following API's

IEMS registers with the Preside MDM Server with the following API,

- `_cmd: REGISTER`
- `_user_id: chris`

After registering with the Preside MDM, IEMS sends the following API to retrieve the devices (Passports, Platforms and VSPs) residing under this Preside MDM EM.

- `_cmd: GET`
- `_obj_class: network`
- `_obj_id: networkId S compRoot`
- `_scope: NEXT`
- `_filter: objectClass EQ S node`
- `_attr_id: ALL`

and the response message for the above API looks like the following one.

```
_obj_class: node
_obj_id: compId NI EM CLEVELAND
_attr: rawState E INSV
_attr: compAckState E notAcked
_attr: compCriticality I 90
```

```
_obj_class: node
_obj_id: compId NI NMS FT1400-2
_attr: rawState E INSV
_attr: compAckState E notAcked
```



\_attr: compCriticality I 80

If the response message contains “NMS” in the obj id, then it is modeled as MDM platforms (since there is no unique way to distinguish between the client sets/server sets platforms we are modeling it as a MDM platform). This auto discovery of client sets and server sets functionality are supported only for SN08 release and not for the pre-SN08 versions.

Just like other devices (Element Managers, platforms, Applications), the auto discovered MDM client sets and server sets platforms are also modeled as a ManagedObject and refer “Map representation of Client set and Server set platforms” for the Map display for these platforms.

**Note:** No support will be provided to provision the MDM platform 8.0 version from the “Add Platforms” menu.

### 1.3.2 Map representation of Client set and Server set platforms

The client sets and the server sets will be displayed to the topology tree under the “EMS Platforms -> MDM”. Representation for the same is shown below

```
EMS Platforms
|
|
| __ MDM
```

In the right side work area of the “MDM”, IEMS displays both client sets and the server sets platforms of all discovered Preside MDM Servers. In order to identify to which the Preside MDM Server the client sets/server sets belong, IEMS appends the displayName of the Preside MDM Server along with the displayName of the client sets/server sets platform in the right side work area.

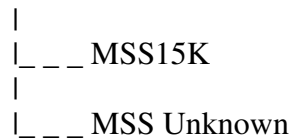
### 1.3.3 Map representation of Preside MDM Mgr and its associated NEs

The existing grouping of Preside MDM Mgr and its associated NE's are as follows

```
Element Manager
|
| __ Preside MDM (displayName)
```

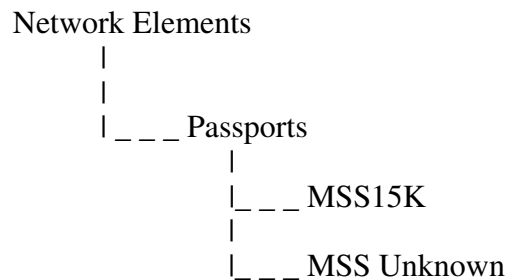
In the right side work area of the “Element Manager”, IEMS displays all discovered Preside MDM EM's. In the right side work area of the “Preside MDM (displayName)”, IEMS displays both the Units (Unit0 and Unit1) for duplex whereas for simplex it doesn't display anything.

```
Network Elements
|
| __ Passports
```



In the right side work area of the “Passports”, IEMS displays the Passport devices (MSS15K, MSS Unknown etc) of all discovered MDM Servers, whereas in the right side work area of the “MSS15K” and “MSSUnknown”, IEMS displays the respective Passport devices.

The new grouping of Preside MDM Mgr and its associated NEs are as follows



In order to maintain consistency across the IEMS, the same tree structure is retained as like pre-SN08 release. In order to identify to which MDM Server the Passports/MG15000 (previously PVG)'s belongs, IEMS appends the displayName of the MDM Servers along with the displayName of the Passports/MG15000 (previously PVG)'s in the right side work area.

### 1.3.4 Fault mapping for auto discovered MDM Platforms

IEMS listens for the client sets and server sets alarms and correlates the same against the corresponding platforms. The correlation used is the same as like that of Preside MDM EM Passports etc.

Procedure to generate the Warning fault for MDM Platform from the *wcary3r6* - Preside MDM Server

- 1 Invoke the *nmstool* from *wcary3r6* (the absolute path is */opt/MagellanNMS/bin/nmstool*)
- 2 From the GUI invoke *System* menu
- 3 From the menus invoke *Administration* menu
- 4 From the menus invoke *Server Administration* menu
- 5 From the menus invoke *Security* menu
- 6 From the menus invoke *Authorize* menu
- 7 Click ‘ok’ without entering the password – This will generate a Warning alarm for the WCARY3R6 MDM platform.

### 1.3.5 Operator Client GUI Launch

A new menu item “MDM Operator Client GUI” will be provided to the context menu for Preside MDM Mgr. This menu will be available on the right click of the Map Symbol of Preside MDM Mgr 8.0 version. This menu is supported only for SN08 release and not for the pre-SN08 versions.

On clicking this menu item, IEMS will invoke the following URL in the client browser,

**http://<ipaddress>:8080/UI**

where <ipaddress> is the Preside MDM Server IP Address.

### 1.3.6 MDM X11 Client launch

In SN08, X11 communication is secured via SSH using MindTerm tool. The X11 Client launch requires X server needs to be run in the local client machine. In the case of Solaris/Linux, Xserver runs by default and in the case of Windows, Hummingbird or Exceed is used as Xserver.

A new menu item “Legacy MDM Tools” will be provided to the context menu for Preside MDM Mgr. This menu will be available on the right click of the Map Symbol of Preside MDM 8.0 version. This menu is supported only for SN08 release and not for the pre-SN08 versions.

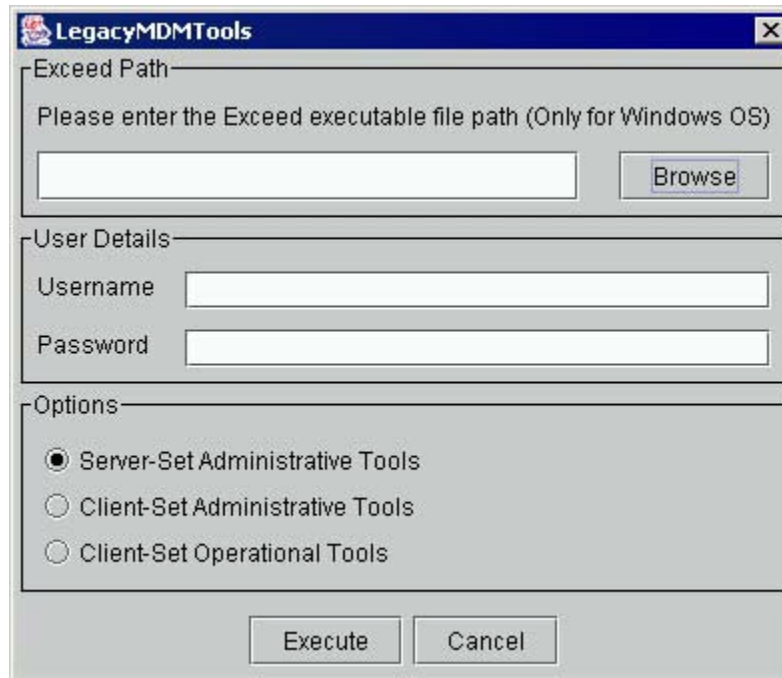
On clicking this menu, IEMS will launch a “LegacyMDMTools” dialog, which captures the following attributes

- Text field to enter the Exceed executable file path (for Windows OS only).
- Text fields to enter Username/Password.
- Radio buttons with the following options
  - Server-Set Administrative Tools
  - Client-Set Administrative Tools
  - Client-Set Operational Tools

All the above options will invoke the nmstool with the parameter as said below

- 1 Server-Set Administrative Tools -- > "/opt/MagellanNMS/bin/nmstool admin"
- 2 Client-Set Administrative Tools -- > "/opt/MagellanNMS/bin/nmstool admin"

- 3 Client-Set Operational Tools -- > "/opt/MagellanNMS/bin/nmstool operation"



On executing the launch with proper configuration, the launch triggers an X11 connection from the corresponding device back to your desktop, and brings up the nms toolset menu with the given option.

**Note:** Since “LegacyMDMTools” has the same functionality of “MDM GUI Mgr”, the menu “MDM GUI Mgr” is disabled for Preside MDM 8.0 devices.

### 1.3.7 Command Line launch for MDM Passport

A new menu item “Command Line” will be provided to the context menu for Passport Network Elements that belong to Preside MDM 8.0 version. This menu will be available on the right click of the Map Symbol of Passport Network Elements. This menu is supported only for SN08 release and not for the pre-SN08 versions.

For “Command Line” launch, IEMS will initiate one-step login between the IEMS client and the Preside MDM server, that is IEMS will invoke an SSH client to log in to the Preside MDM Server. For this launch, IEMS will not use the SSO token for login into the Preside MDM Server. Instead, IEMS will gather credentials for login by prompting for entry of userid and password.

### 1.3.8 Testing Considerations

The following are some of the test considerations to be captured along with the new enhancements for backward compatibility in the test plans.

- Provision a Preside MDM 6.2 system in IEMS
- IEMS launching of the preside MDM 6.2
- Provision a Preside MDM 7.0 system in IEMS
- IEMS launching of the preside MDM 7.0
- Provision a Preside MDM 8.0 system in IEMS
- IEMS launching of the preside MDM 8.0

## 1.4 Glossary

SSH - Secure Shell

GUI - Graphical User Interface

MDM - MultiService Data Manager

IEMS - Integrated Element Management System

CLUI - Command Line User Interface

## 1.5 References

A00000000.2.doc

IEMS\_Topology.pdf

IEMS\_Client\_Launch.pdf

A00007345\_IEMS\_MDM\_Changes\_DID\_v2.pdf

***Product = IEMS***

## **A00007346--Backward Compatibility in IEMS**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

## 1.2 Introduction

IEMS serves as an integrated platform for managing various devices. This module is for providing Backward Compatibility in IEMS so that all the SN08 device versions and the previous device versions are supported in IEMS. This document lists the IEMS design changes required for the devices where an interface change was identified.

The IEMS must maintain backwards compatibility with its managed components for N-2 Succession releases. This SN08 activity required a Succession-IEMS Prime to perform the research with the help of IEMS managed component design primes to identify changes to their management interfaces that would impact their backwards compatibility with the IEMS.

The primary interfaces that needed to be analyzed through this activity included the topology, fault, performance, security (authentication and authorization), and client launch (CLUI and GUI) interfaces. Changes to the High Availability model of the IEMS managed component were also analyzed. If there were no “currently known” changes to an IEMS managed component's interface, it was so documented in the DID.

Where component interface changes have occurred, the Succession-IEMS Prime acquired information about the changes to the management interfaces of the IEMS managed components and provided the specifics to the Adventnet team.

In light of the details provided to Adventnet, design changes will be made to the IEMS to ensure that the IEMS can manage the new SN08 component version variants while being able to manage the older component versions (i.e., SN6.2, and SN07).

A regression test plan has been created in light of the research conducted for this feature. This activity is primarily targeted to perform the necessary regression testing with the IEMS managed components to ensure that backwards compatibility is maintained.

A request for information was made to various component primes for information on interface changes towards IEMS in SN08. The results of this research are documented in the DID. The DID was reviewed and updated with comments. It should be considered a snapshot in time and is based on the information available.

The following components were identified to have some SN08 changes that needed to be further explored.

- In SN08, the USP NE component had plans to make a Syslog feed available to the IEMS. USP will make the security and audit streams available to the IEMS. It is expected that the custlog stream will still not be made available to the IEMS in SN08.
- MDM related changes are being covered by a SN08 feature A00007345.
- MSS2000 related changes are being covered by a SN08 feature A00007341.
- CEM related changes are covered by a SN08 feature A00007347. In SN08, the CS2K Core Manager will provide faults to IEMS via CEM. Any SN08 changes to provisioning the CS2K Core Manager in IEMS will fall under the above-mentioned CEM feature.
- The version of MCS that lines up with SN08 is MCS4.0. A number of IEMS changes needed to cater to MCS4.0 architectural changes are slated to be addressed in SN08. The appropriate portion of the FN will address those MCS related changes.

### 1.3 Acronyms Used

IEMS -Integrated Element Management System  
EM -Element Managers  
HA -High Availability.  
SM -System Manager  
FPM -Fault Performance Manager.  
SSH-Secure Shell

### 1.4 MCS Changes

SN08 lines up with MCS version 4.0.

There can potentially be more than one independent MCS network in a Central Office being monitored by IEMS.

MCS follows a HA model and may be deployed in the field in a simplex or a duplex configuration. In SN08, IEMS is adding support for the HA model (both simplex and duplex configuration).

Each independent MCS system will be represented by an “MCS NE” object in the “Network Elements” folder. This “MCS NE” is an opaque BLOB that will be the central point for aggregating faults from all corresponding SM and FPM objects provisioned into IEMS. (Note: An independent MCS system may be managing an RTP Media Portal in which case the parent object representing an entire MCS System will be an RTP Media Portal object in the “Network Elements” folder.)

The changes for MCS are divided into two categories. The first describes the changes for the System Manager and the second describes the changes related to the Fault Performance Manager.

#### 1.4.1 System Manger

An MCS System Manager will always provide Fault and Performance capabilities.

A simplex MCS system will be represented in IEMS by a managed object signifying a logical SM and a managed object signifying a physical active System Manager.

A duplex MCS system will be represented in IEMS by a managed object signifying a logical, SM and two managed objects signifying a physical active and a physical alternate System Manager. The section below covers the various requirements for the MCS system manager.

#### 1.4.2 Topology

The System Managers should be shown under the “Element Manager” node of the topology tree.

There can be more than one independent MCS network in the CO, each having a unique virtual IP (which will be entered into IEMS when configuring the System Managers). Therefore, the EM navigation tree will contain as many System Manager nodes under it.

In the new model, physical and logical SM servers will be displayed in the navigation tree. Logical System Managers (which represent the Virtual IP of the MCS SM) are parents to Physical SMs. The logical System Managers will be shown directly under the EM node. The physical active and alternate System Managers will be shown as sub-nodes of a logical System Manager.

The naming convention of the System Manager is MCS\_SM (UserAssignedNameOfSM).

The topology tree for the MCS system managers will be displayed as

```

Element Managers +-
                  |
                  +- MCS SM1 (logical) +-
                  |                     |
                  |                     | SM1 (physical - active)
                  |                     +- SM1 (physical - alternate)
                  |
                  +- MCS SM2 (logical) +-
                  |                     |
                  |                     | SM2 (physical - active)

```



+ - SM2 (physical - alternate)

**Note:** Each logical SM represents an independent MCS system.

Each MCS system will be represented by a Managed Object under the Network Element and will be an opaque BLOB. Faults from ALL SMs and FPMs should be resolved to the corresponding MCS object in the Network Elements folder.

The naming convention of the MCS Network Elements is MCS/CSE (UserAssignedNameOfTheCorrespondingSM)

**Note:** An independent MCS system may be managing an RTP Media Portal in which case the parent object representing the entire MCS System will be an RTP Media Portal object in the “Network Elements” folder.

The tree representation of the NE is as follows:

Network Elements

```
|
+- MCS/CSE (UserAssignedNameOfTheCorrespondingSM)
|
+- RTP Media Portal (UserAssignedNameOfTheCorrespondingSM)
|
+- MCS/CSE (UserAssignedNameOfTheCorrespondingSM)
|
```

### 1.4.3 Modifications to the “Add EM” GUI:

When adding an MCS System Manager, the IP that is given initially is the Virtual IP of the system.

The GUI should contain a combo box to enable a user to select a “Simplex” or a “Duplex” MCS system.

If the “Simplex” mode is selected, there should be a provision to enter one IP addresses, the physical IP of the active system manager.

If “Duplex” mode is selected, there should be provision to enter two IP addresses representing physical IP addresses of the active and the physical IP of the alternate System Manager.

Text-entry GUI elements should be introduced to let the operator enter a username and password (employed for SM CLUI launch).

#### 1.4.4 Fault

In SN08 the protocol for the SM's fault interface continues to be SNMP traps. The fault data will be collected from the physical active SM. For data collection (resynchronize/pull), the physical IP of the SM will be used. The active System Manager will have an SNMP agent running in it while the alternate System Manager will not have an SNMP agent running in it.

The System Manager object representing the physical active system manager will show the highest severity fault status of the physical active System Manager. The System Manager object representing the physical alternate System Manager will be in an unknown state. IEMS will continue to listen for events from the alternate SM server and will thereby be able to recognize that a SWACT has taken place between mates within a MCS SM pair.

The System Manager object representing the logical system manager will display the highest severity fault status of the physical active System Manager. If IEMS is not able to contact both physical SM servers (active and alternate), the object representing the logical System Manager will display an unknown state until such time that IEMS regains contact. A "Comm. Failure" fault will be issued by IEMS if the both physical SM servers of a duplex system cannot be contacted.

**Note:** A "Comm. Failure" fault will be issued by IEMS if the physical SM server of a simplex system cannot be contacted.

An operator will retain the capability of manually toggling a **physical** SM server between an Unmanaged and Managed state. IEMS will not collect fault or performance data from a server in an unmanaged state. If an MCS SWACT takes place during the time a server has been set to Unmanaged via IEMS, the icons for the server in unmanaged state will only be updated after the operator manually brings back the server to a Managed state.

The MCS Object under the Network Elements will be automatically updated with the corresponding fault status due to the parent-child relationship. If IEMS is able to contact at least one physical SM server (active and alternate) or an FPM server, the object representing the Network Element will display the highest severity fault status of the aggregate SM and FPM servers. Otherwise, the MCS NE icon will be in an unknown state.

##### 1.4.4.1 Notes:

- 1 All managed objects corresponding to MCS physical servers (SM and FPM) should have manage/unmanage capability.
- 2 All managed objects corresponding to MCS logical components (logical SM and MCS NE) should have manage/unmanage capability.
- 3 Cascading of Managed/Unmanaged state

- When a user sets the logical SM managed object to “Unmanaged state”, the MCS SM physical servers should be forced into “Unmanaged state”.
- When a user sets the logical SM managed object to “Managed state”, the MCS SM physical servers should be forced into “Managed state”.
- When a user sets the MCS NE managed object to “Unmanaged state”, the MCS SM logical, MCS SM physical and FPM physical servers should be forced into “Unmanaged state”.
- When a user sets the MCS NE managed object to “Managed state”, the MCS SM logical, MCS SM physical and FPM physical servers should be forced into “Managed state”.

### 1.4.5 Detecting the Active SM Server

- 1 Polling the SNMP agent for the System Managers. The alternate system manager will not have an SNMP agent running. The SM, which has the SNMP agent running, is the active System Manager. An SNMP query to the inactive server will result in a time-out. A “Comm. Failure” fault will be issued by IEMS if the both physical SM servers of a duplex system cannot be contacted.

**Note:** A “Comm. Failure” fault will be issued by IEMS if the physical SM server of a simplex system cannot be contacted.

- 2 IEMS will receive a coldstart from MCS object with the active server's IP address. IEMS will use this to identify the active system manager.
- 3 If a SWACT has taken place, the fault will be received from the physical IP of the previously alternate system manager. IEMS should recognize this change in the IP and determine that a SWACT had taken place.

### 1.4.6 Performance

The protocol for MCS SM's performance interface in SN08 continues to be sftp. An MCS System Manager will always provide Fault and Performance capabilities. The performance data will be collected from the physical IP's of the active physical System Manager.

IEMS should have a work item to change the current way we configure our collection job for MCS. Currently we can set up only one file filter for the MCS device (as it is associated with the MCS SM MO, not the collection job). This does not allow us to collect unique sets of data with multiple MCS collection jobs in the IEMS. The ability of specifying unique directory and file filters will help in two ways:

- MCS4.0 can be configured for collecting different sets of data with multiple collection intervals (i.e., 5 min and 30 min) at the same time, and the csv files reside in different directories. An operator should have the ability to collect and report data for multiple collection intervals.
- The MCS system monitors a number of devices and the csv files for different devices reside in different directories. An operator should have the ability to collect and report data for individual devices.

Previous to MCS4.0, performance data used to reside in:

“/IMS/tss/data/oss/OM/b643net/MgmtSite/\*/\*”

For MCS 4.0 release, the performance data are in the directory:

“/var/mcp/oss/om/MCP\_4.0/<fault-performance manager instance id>/<network element instance id>/<file format option name>”, e.g. “/var/mcp/oss/om/MCP\_4.0/FPM1\_0/\*/\*/csv-file” where \* is a wildcard representing “network element instance id”.

#### 1.4.7 CLUI Launch

The SM will support GUI and CLUI launch. The GUI launched will be the MCP System Management Console running on the SM.

There is a CR (#Q00963269: Menu entries for GUI launch ignore device variant) related to the SN07 device variant not being taken into consideration when a pop-up menu is invoked off an MCS Manager object. This CR will be addressed and the deficiency it points out retested during SN08 IT of MCS enhancements.

There is a CR (#Q00964269: Need unique instance of GUI launch file-chooser for each MCS Manager Object) related to the same instance of file-chooser being launch for all MCS Manager objects. This CR will be addressed and the deficiency it points out retested during SN08 IT of MCS enhancements.

In spite of the fact that the MCS4.0 SM GUI is a Java Web Start Client, the MCS team has made a decision not to support MCS SM GUI Launch on a Unix console. The MCS4.0 SM GUI (called the MCP System Manager Console) will only be launched on Windows platforms. If a Windows Client does not have the correct version of JRE needed for the MCS SM GUI, an automatic download (of the JRE) from the MCS SM server will be initiated.

The CLUI launch should proxy to the IEMS server and then SSH to the IP of the SM.

## 1.5 Fault Performance Manager (FPM)

A new device called the FPM is introduced in SN08. This will supplement the MCS SM in very large COs. Accordingly, there may be zero, one or more FPMs present in the MCS system. The FPMs are designed to provide fault and performance data. When the CO gets larger, more FPMs will be added to the system. FPMs DO NOT abide by the HA model followed by MCS SM.

As the FPM supplements an SM in the system, the user should not be able to provision an FPM in IEMS until an SM is added. When provisioning an FPM in IEMS, the user should choose the SM with which this FPM is associated. The FPMs that supplement the SM will need to be added manually into IEMS.

### 1.5.1 Topology

Similar to SMs, the FPMs will be shown under the “Element Manager” node in the topology tree. As there can be more than one FPMs in the system, there will be as many FPMs under the “Element Manager” node in the topology tree.

The naming convention of the FPM is MCS\_FPM  
(UserAssignedNameOfSM\_UserAssignedNameOfFPM)

The tree representation of the FPMs will be as follows.

```
Element Managers +-  
                  |  
                  +- MCS FPM1 (utilizing a physical IP)  
                  |  
                  +- MCS FPM2 (utilizing a physical IP)  
                  |  
                  +- MCS FPM3 (utilizing a physical IP)
```

### 1.5.2 Introduction of a new “Add EM” GUI

The ability to provision an FPM into IEMS as a separate EM will be provided via the new “Add EM” GUI. The IP that is entered by the user is the physical IP address of the FPM.

As FPMs are subordinate to SMs, an FPM should always be associated to an MCS4.0 SM. Hence, if an MCS4.0 SM is not already added in IEMS, the user should not be able to add an FPM object in IEMS. Accordingly, in the FPM addition GUI, a combo box will be shown that will list the already added MCS4.0 SMs in IEMS. The user should associate this FPM with one of the listed MCS4.0 SMs by choosing an MCS4.0 SM from the combo box.

**Note:** Note: An SM which is not for an MCS4.0 Solution should NOT appear in the combo-box.

Text-entry GUI elements should be introduced to let the operator enter a username and password (employed for FPM CLUI launch).

### 1.5.3 Fault

The fault interface (SNMP traps) used to collect the fault information for SMs can be used for FPMs too. The fault data can be pulled (resynchronized) from the IP address of the FPMs. The MCS object in the Network Elements folder will be automatically updated with the corresponding fault status due to the parent-child relationship.

### 1.5.4 Performance

The protocol for MCS FPM's performance interface in SN08 will be sftp. The performance data will be collected from the physical IP's of the FPM (Fault and Performance Manager).

FPMs should be listed as a distinct entity (i.e. in addition to the SM in the "Device type" comboBox on the IEMS PM CollectionJob GUI panel

Previous to MCS4.0, performance data used to reside in:

`"/IMS/tss/data/oss/OM/b643net/MgmtSite/*/0"`

For MCS 4.0 release, the performance data are in the directory:

`"/var/mcp/oss/om/MCP_4.0/<fault-performance manager instance id>/<network element instance id>/<file format option name>"`, e.g. `"/var/mcp/oss/om/MCP_4.0/FPM1_0/*/csv-file"` where \* is a wildcard representing "network element instance id".

### 1.5.5 GUI/CLUI Launch

The FPM will support GUI and CLUI launch. The GUI launched will be the MCP System Management Console running on the SM.

The following CRs and GUI information were discussed earlier and are repeated here for ease of reference.

There is a CR (#Q00963269: Menu entries for GUI launch ignore device variant) related to the SN07 device variant not being taken into consideration when a pop-up menu is invoked off an MCS Manager object. This CR must be addressed and the deficiency it points out must be retested during SN08 IT of MCS enhancements.

There is a CR (#Q00964269: Need unique instance of GUI launch file-chooser for each MCS Manager Object) related to the same instance of file-chooser

being launch for all MCS Manager objects. This CR must be addressed and the deficiency it points out must be retested during SN08 IT of MCS enhancements.

In spite of the fact that the MCS4.0 SM GUI is a Java Web Start Client, the MCS team has made a decision not to support MCS SM GUI Launch on a Unix console. The MCS4.0 SM GUI (called the MCP System Manager Console) will only be launched on Windows platforms. If a Windows Client does not have the correct version of JRE needed for the MCS SM GUI, an automatic download (of the JRE) from the MCS SM server will be initiated.

The CLUI launch should proxy to the IEMS server and then SSH to the IP of the FPM.

## 1.6 Deleting the Managed Objects

### 1.6.1 Deletion of an FPM

To delete an FPM, the user can right-click on the FPM object and click on the “Delete” menu item. This will delete the selected FPM.

### 1.6.2 Deletion of an SM

To delete an SM, the user can right-click in the SM object and click the “Delete” menu item. This will delete the selected SM object. However, since an SM can have zero or more FPMs under it, the user should not be able to delete an SM unless all the FPMs that are associated with the SM are deleted. If a user chooses to delete an SM that contains one or more FPMs under it, the user should be informed to delete all the FPMs under it and then delete the SM.

*Note:* Cascade deletion of an SM and all the FPMs under it is not provided to make the user realize the effects of the operation.

### 1.6.3 Deletion of the NE

Since the user is not adding the NE manually, there will not be any manual deletion option for the NE. Once an SM object is deleted, the associated NE will be automatically deleted from the “Network Elements” folder.

### 1.6.4 Changing the IP address of the Logical or Physical System Manager

The user will be able to change the IP address of a Logical or Physical System Manager that has one or more FPMs without actually deleting and re-adding an SM object (since deletion of an SM object is disallowed for SMs with corresponding FPMs).

## 1.7 References

1. A00007346\_IEMS\_Backward\_Compat\_DID\_v5.pdf
2. MCP\_OAM\_SysArch\_(PDF).pdf

## ***Product = IEMS***

### **A00007347--CEM Integration with IEMS**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

##### **1.2.1 Alarm Properties**

There is a new field within IEMS in the alarm properties which indicate whether the alarm is manually clearable as documented here by the IEMS design team:

IEMS Alarm Properties Dialog would include alarmClear property from now on to identify manually clearable and non clearable alarms.

The alarmClear attribute would now be shown in the Alarm Properties Dialog. The value of this would be mapped to

other (1),  
forbidden (2),  
required (3),  
optional (4)

"This object provides guidance to a mid-level manager on the handling of this alarm. A value of forbidden indicates that a mid-level manager MUST NOT allow this alarm to be manually cleared. A value of required indicates that this alarm has no corresponding clear so MUST always be manually cleared. A value of optional indicates that this alarm does have a corresponding clear, but that it MAY also be cleared manually. A value of other indicates that the manual clear status is either unknown or not one of the specified values."

This attribute can potentially be used to identify the manually clearable events.



**Nortel Networks Custom Alarm Properties ----comp5iems** [X]

**Alarm User Properties**

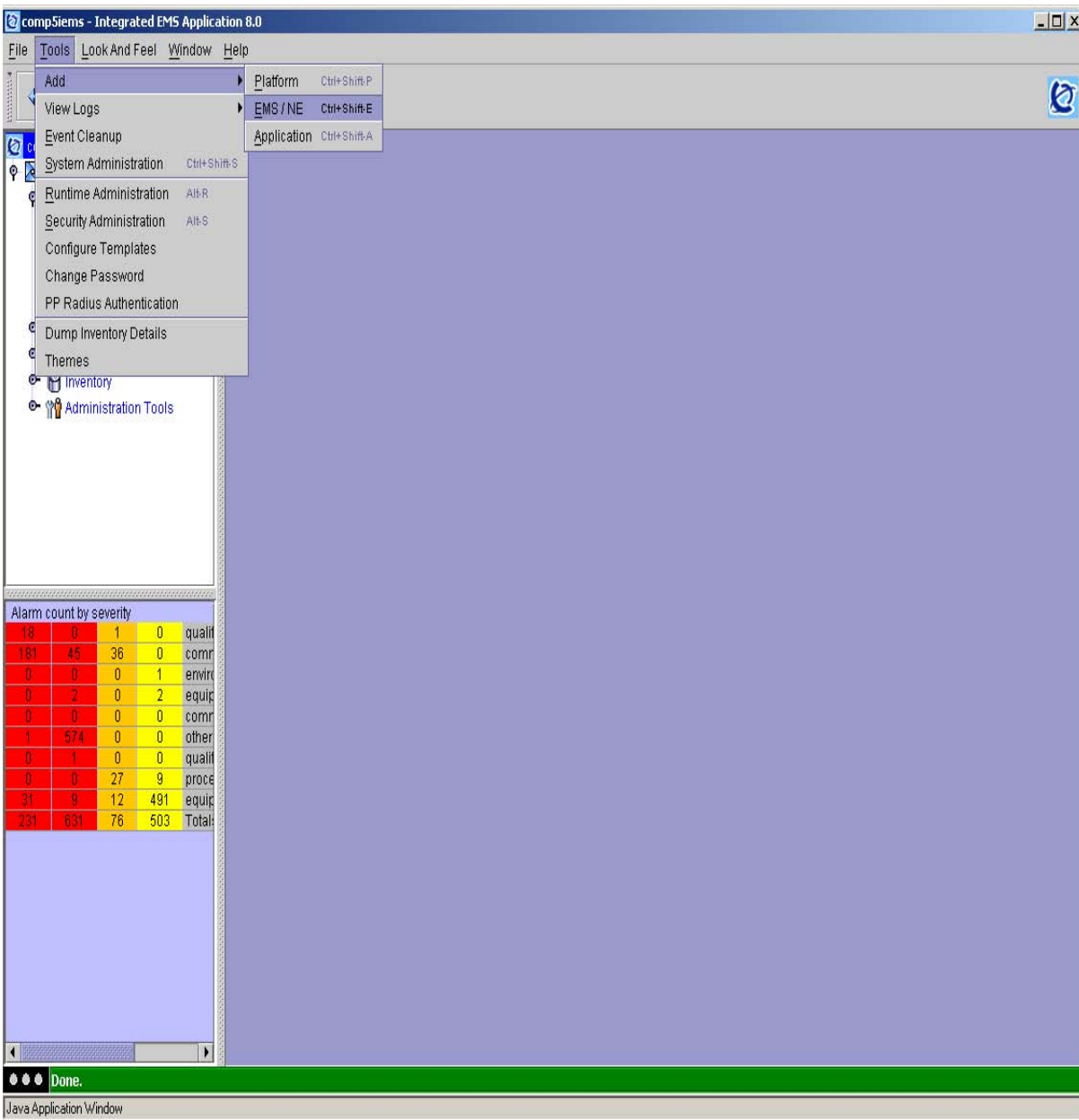
|                     |                                                                                                                                      |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| logName             | IEMS                                                                                                                                 |
| logNumber           | 398                                                                                                                                  |
| componentID         | anc0t0jn.us.nortel.com-SSPFS-Unit-0                                                                                                  |
| eventType           | FLT                                                                                                                                  |
| eventLabel          | Communication Lost                                                                                                                   |
| logKey              | IEMS398                                                                                                                              |
| probableCause       | communicationsSubsystemFailure                                                                                                       |
| alarmClear          | 2                                                                                                                                    |
| sequenceNumber      | 0                                                                                                                                    |
| alarmIndex          | 3                                                                                                                                    |
| bodyText            | Location: 47.142.128.86<br>NotificationID: 0<br>State: Raised<br>Category: Communications<br>Cause: Communications subsystem failure |
| equipmentIdentifier | anc0t0jn.us.nortel.com-SSPFS-Unit-0                                                                                                  |
| neType              | IEMS                                                                                                                                 |

OK Close Help

Java Application Window

## 1.2.2 Configuring a CEM

To configure a CEM is like any other NE, simply choose tools, add EMS/NE



Enter the DNS name, or IP address along Host Name / IP Address. Display name should be the “Element Name” chosen when configuring the CEM on the SSPFS using configCEMS. Change Device Type to CEM Mgr. Click Next, Next and Finish.

## 1.3 Hardware Requirements or Dependencies

## 1.4 Software Requirements or Dependencies

## 1.5 Limitations and restrictions

## 1.6 Interactions

## 1.7 Glossary

| Term     | Description |
|----------|-------------|
| New term | Definition  |

## *Product = IEMS*

## **A00007359--USP/USP-Compact: Log Delivery Stream to IEMS**

### *Functional Description*

#### 1.1 Applicable Solution(s)

PT-IP, UA-IP, IAC, IAW, PT-AAL2

#### 1.2 Description

This feature enhances the functionality of USP by supporting the delivery of security and audit logs to the IEMS syslog server or any other application. However, this feature will be tested with IEMS based syslog server. USP log data is sent to IEMS in unformatted manner using syslog.

Currently, the USP only sends Alarms via the SNMP interface (integrated into IEMS, Micromuse and some customer OSS's). This functionality will remain unchanged.

No new logs will be introduced under this feature. The current USP log format and the data contained in the USP logs will not be changed under this feature

The user could provision the following parameters from the USP GUI panel to deliver the logs to syslog server.

- Log-delivery Enable/Disable option.
- Primary IP address of the IEMS server.

- An optional backup/secondary IP address of the IEMS server.
- Non editable transport protocol used (i.e. UDP/TCP) to deliver the logs
- Non editable port number [defaulted to 514].
- Select the category of logs (i.e. security and audit logs) to be delivered.

Following mockup snapshots show how the log delivery panel can be launched and how the user can modify log-delivery information.

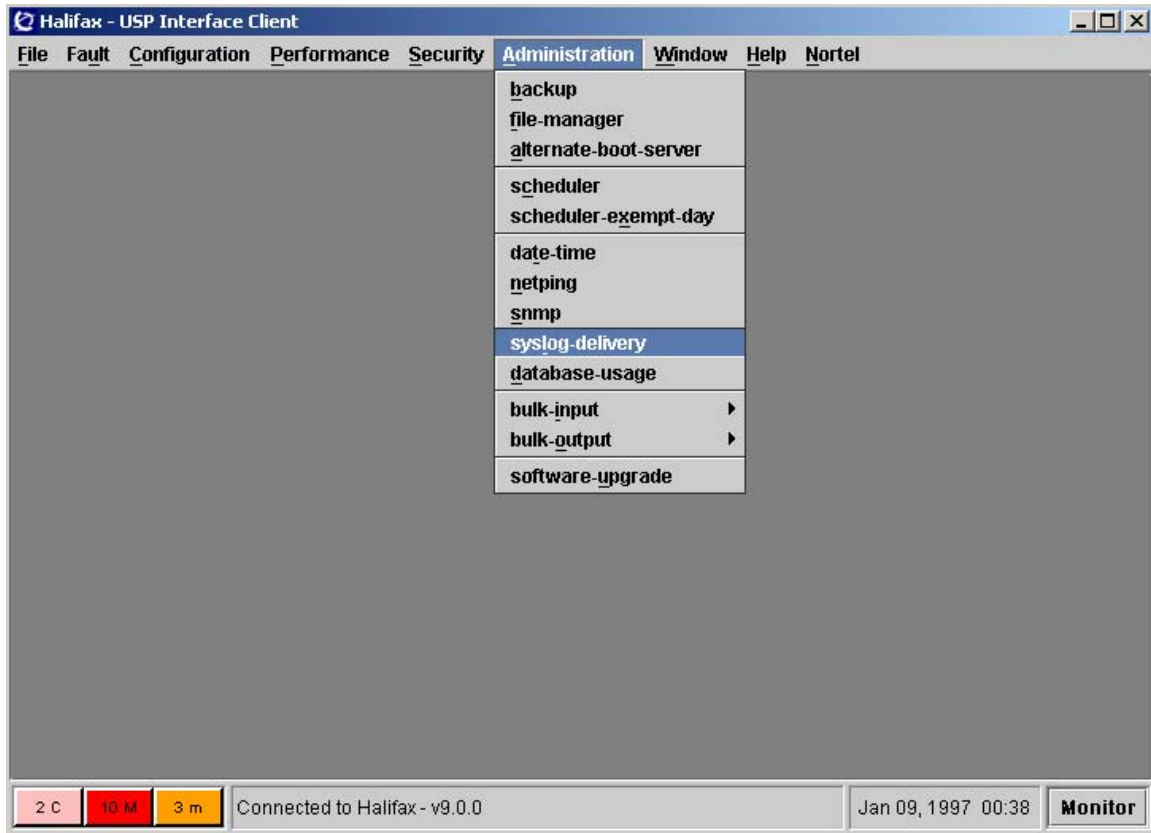


**Figure 1 IEMS Log Delivery Feature Launch Panel**

**Figure 2 IEMS Data Provisioning Panel**

Two categories of logs i.e. Audit Logs and Security Logs are supported.

The user has the flexibility of selecting to deliver either security logs or audit logs or both categories of logs to IEMS server.

USP follows syslog format for sending Audit and Security Logs.

Following is the Syslog format used for delivering security and audit logs to IEMS server.

Syslog Format:

```
<PRI> "date-time" "system name" "Message-
Version" ... USP log data with fields delimited by ;
...
```

- The <PRI> field or priority represents the Facility and Severity. The priority is a one, two or three decimal integer enclosed in an angular braces "<>"
- Date-time field follows the "<yyyymmdd>T<hhmmss.ssss>{+|Z|-}hh" format and >{+|Z|-}hh refers to daylight savings time.
- System name refers to the source device's hostname.
- Message Version indicates the USP/USP-Compact messaging version.

- USP Log data fields will follow the order as follows:  
log-severity; log-group-name; log-number; system-node-name; log-description; log-date-time; data; module-name; line-number; task-name; sending-node-name; shelf; slot; context-id; log-group-id

Following are the samples of audit and security logs on USP which shall be delivered to IEMS:

Example of the security log in syslog format

```
<157> 19970101T04:23:28.0000Z-05 USP1 1 77;LOG_INFO;FTP Server;  
1;sco1_12;full access enabled for user-id FIELD : ID=0x0; ;01/01/1997  
04:20:18;ftpServer.cc; 892;tdbgServerTask;sco1_12; 0; 12;0x0; 46;
```

Example of the audit log in syslog format

```
<133> 19970101T05:10:24.0000Z-05 USP1 1 127;LOG_INFO;Journal Files;  
1;sco1_12;FIELD@192.219.223.243:system mod:success;0x620 0x0 1 SCORPIO1  
direct ;01/01/1997 05:10:24;oamUtils.c; 114;oamSrvTask;sco1_12; 0; 12;0x0; 41;
```

### 1.3 Hardware Requirements or Dependencies

This feature requires IEMS server and USP platforms [USP and USP-Compact].

### 1.4 Software Requirements or Dependencies

This feature requires USP10.0 or later of the USP software with enhanced IEMS software SN08 or later.

### 1.5 Limitations and restrictions

This feature does not support TCP based log-delivery.

### 1.6 Interactions

This feature does not change the existing functionality of USP GUI or the USP system software. There is an impact of software upgrade on this feature. If an upgrade is performed from older versions to USP10.0 or later, a new table in the RDM database will get added. This table will have information about the IEMS server.

USP interacts with IEMS server over UDP socket for sending audit and security logs.

### 1.7 Glossary

| Term | Description                          |
|------|--------------------------------------|
| IEMS | Integrated Element Management System |
| IP   | Internet Protocol                    |

|      |                                    |
|------|------------------------------------|
| OSS  | Operations Support System          |
| RDM  | Raima Database Manager             |
| SNMP | Simple Network Management Protocol |
| TCP  | Transmission Control Protocol      |
| UDP  | User Datagram Protocol             |
| USP  | Universal Signaling Point          |

***Product = IEMS***

## **A00007388--IEMS Performance Phase II**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Triggering Support**

To achieve minimum time for OM collection attributes, execution of data collection, report generation and transferring the same to OSS can be combined together using triggering support of Performance interface. An easier and simple GUI will be provided in order to configure collection, reporting and transfer job details in one shot with triggering support. After the completion of data collection, report generation will be triggered while data is being written to the database in order that the report can be generated without reading data from the database. Once report generation has been completed, a transfer job will be triggered so that all the reports are transferred to OSS.

##### **1.2.1 Triggering data collection**

CollectionJob should be triggered by a configured event of the device, if the device supports the same, or as the usual way based on the granularity period of the Collection Job. Say, for a particular device MG9000, if an event of category Performance has been added from CORBA notification, then CollectionJob should be triggered for that device. If the device doesn't support these kind of notifications, then the Collection Job would be executed based on the granularity period.

### 1.2.2 Triggering report generation

Report jobs can be configured to run as scheduled mode based on the granularity period, as well as by triggered mode by the configured Collection job. Mode of executing the reports, either scheduled mode or triggered mode, would be captured in Report Job itself by using the *executionMode* property. In the case of triggered mode, name of the Collection job which would trigger the report would be identified by using *colJobList* parameter. It should be noted that only one Collection Job would be allowed to associate with the Report Job for triggering the same.

For Report jobs created with triggered mode, *executionMode* property will be set to 'triggered' and 'colJobList' property will be set to the name of the Collection Job, on whose completion this report should be triggered. For Report jobs created with scheduled mode, *executionMode* property will be set to 'scheduled' and *colJobList* should be set to 'none'.

In the scheduled mode, reports are generated based on the granularity period. For triggered mode, after the Collection job's completion, a report configured with trigger mode for this Collection Job will be triggered. Report generation will be triggered while data is being written to the database in order that the report can be generated without reading data from databases. This will reduce the time required to read the data from database for report generation.

### 1.2.3 Triggering report transfer to OSS

Transfer jobs can be configured to run as scheduled mode based on the granularity period, as well as by triggered mode by the Report job. Mode of executing transfer jobs, either scheduled mode or triggered mode, should be captured in Transfer Job itself by using the *executionMode* property. In the case of triggered mode, name of the Report job which should trigger the transfer job would be identified by using *reportJobList* parameter. It should be noted that only one Report Job would be allowed to be associated with Transfer Job for triggering the same.

For Transfer jobs created with triggered mode, *executionMode* property will be set to 'triggered' and 'reportJobList' property will be set to the name of the Report job, on whose completion this Transfer job should be triggered. For Transfer jobs created with scheduled mode, *executionMode* property will be set to 'scheduled' and *reportJobList* should be set to 'none'.

In the scheduled mode, transfer has been done based on the granularity period. For triggered mode, after the Transfer job's completion, transfer jobs configured with trigger mode for this Report job will be triggered.



## 1.3 Performance interface support for new devices

| S.No | Device Type | Supported Performance Interfaces |
|------|-------------|----------------------------------|
| 1    | GWC         | SNMP                             |
| 2    | UAS         | SNMP                             |
| 3    | SAM 21 SC   | SNMP                             |
| 4    | SSPFS       | SNMP                             |
| 5    | MG9000      | CSV                              |
| 6    | USP         | CSV                              |

## 1.4 Logging support

- Log of the Unauthorized Access Attempt: Any unauthorized configuration access attempts of measurement collection jobs should be logged in security log.
- Log of the Unauthorized Access Attempt: Any unauthorized configuration access attempts of measurement transfer jobs should be logged in security log.
- Log of the Unauthorized Access Attempt: Any unauthorized configuration access attempts of measurement report jobs should be logged in security log.

## 1.5 Enhanced GUI support

- Easier and simple GUI for configuring Collection job, Report job and Transfer job in single shot with built in triggering capability. (low priority)
- Current Measurement Collection job display should also include the status of the current/previous collection activity and the scheduled time of the next collection (if applicable)
- The display of Current Measurement Transfer job should also include the status of the current/previous transfer activity and the scheduled time of the next transfer (if applicable).
- The display of current Measurement Report jobs should also include the status of the current/previous report job activity and the scheduled time of the next report generation (if applicable).

## 1.6 Intuitive Reports

Presentation of Analysis Result: IEMS shall provide the mechanism through which the result of performance analysis can be shown as intuitive formats (e.g. graphical performance report, report/table forms etc).

## 1.7 Suspending Collection Jobs

Support would be given such that Collection job would be suspended, if topology component corresponds to this Collection job gets unmanaged.

## 1.8 Multiple folder support for CSV devices (MAS & MCS)

“Currently when we configure the MCS and MAS devices in our topology we are prompted for the device’s performance interface attributes. These attributes include collection directory, file name, transfer type (sftp, ftp or push), userid, pw. These attributes are used for all collection jobs defined against these managed object types. The current issue is that we are unable to define multiple collection jobs for these devices that use unique file collection criteria (file filters). In the case of MCS, it is a rather complex device with ~ 25 sub directories where data could be collected from. While customers may want to configure multiple collection jobs in the IEMS for these devices to collect portions of the data with different collection intervals it can not be done with our current design.”

To overcome the above design issue, the IEMS Performance Metrics Collection Job wizard should be able to get the Directory Name and File Name for the MCS and MAS devices (CSV collection devices).

Java Application Window

IEMS Performance Metrics CollectionJob Details

Name: mcsJob

Status: Enabled

Start Time: Aug 19 2004 05 : 42 : 13 : PM

☐ StopTime: Aug 20 2004 09 : 46 : 44 : AM

Device Type: MAS

Excluded Device List:

- ☐ 192.168.112.108
- ☐ 192.168.112.217

Granularity Period: 5 min

Offset: 0 (mins.)

Template Name

OK Close Help

In the above image, the red highlighted portion will be changed based upon the selected “Device Type”. If the selected device type is SNMP-collection-based device, then the red highlighted portion should be changed to ask associated Template Name. If the selected device type is CSV-collection-based device (MAS or MCS), then the red highlighted portion should be changed to ask the Directory Name and the File Name. By default IEMS will take the directory

name and file name provided in the collection job. If there is no configuration (directory name, file name) made in the collection job, the IEMS will automatically get the directory name and file name from the topology module which configured during the Add device operation.

## ***Product = IEMS***

### **A00007717--Health Monitor Logs** ***Fault Management***

#### **1.1 Applicable Solution(s)**

PT-IP, PT-AAL2

*Note:* At the time of publication, this feature consists of the Fault Management (FM) section only.

#### **1.2 Logs**

##### **1.2.1 Radius Server Health Monitor (EMSS 313)**

###### **1.2.1.1 Format**

*Note 1:* This log is sent directly to syslog via 'logger' UNIX utility.

*Note 2:* Replace all 'carriage returns' below with '^M' characters in code that generates the log.

```
May 10 18:03:56 host1 radsvrHealthMonitor.ksh[pid]: EMSS313 NONE INFO  
EMSS
```

```
Location: 191.1.1.1
```

```
Time: May 10 18:03:56
```

```
Category: processingErrorAlarm
```

```
Probable Cause: outOfService
```

```
Component Id: CLASS=SYS;SYSTYPE=SECMon;SECMonComp=RADSVR
```

```
Description: RADSVR is unhealthy, will restart if currently running.
```

###### **1.2.1.2 Field Descriptions**

**Table 1 Field descriptions**

| Field          | Value                |
|----------------|----------------------|
| Category       | processingErrorAlarm |
| Severity       | NONE                 |
| LogName        | EMSS                 |
| LogNumber      | 313                  |
| EventType      | INFO                 |
| Probable Cause | outOfService         |

### 1.2.1.3 Description / Explanation

This log is produced when ever the radius server health monitor detects the radius process is not functional.

### 1.2.1.4 Recovery Action

The health monitor will automatically try to restart the radius server if it is running already.

### 1.2.1.5 Additional information

Not applicable.

## 1.2.2 Identity Server Health Monitor (EMSS 314)

### 1.2.2.1 Format

*Note 1: This log is sent directly to syslog via 'logger' UNIX utility.*

*Note 2: Replace all 'carriage returns' below with '^M' characters in code that generates the log.*

```
May 10 18:03:56 host1 isHealthMonitor.ksh[pid]: EMSS314 NONE INFO EMSS
Location: 191.1.1.1
Time: May 10 18:03:56
Category: processingErrorAlarm
Probable Cause: outOfService
Component Id: CLASS=SYS;SYSTYPE=SECMon;SECMonComp=IS
Description: Identity Server (IS) is unhealthy, will restart if
currently running.
```

### 1.2.2.2 Field Descriptions

**Table 1 Field descriptions**

| Field          | Value                |
|----------------|----------------------|
| Category       | processingErrorAlarm |
| Severity       | NONE                 |
| LogName        | EMSS                 |
| LogNumber      | 314                  |
| EventType      | INFO                 |
| Probable Cause | outOfService         |

### 1.2.2.3 Description / Explanation

This log is produced when ever the identity server health monitor detects the identity server process is not functional.

### 1.2.2.4 Recovery Action

The health monitor will automatically try to restart the identity server if it is running already.

### 1.2.2.5 Additional information

Not applicable.

## 1.2.3 PAM Login Servlet Health Monitor (EMSS 315)

### 1.2.3.1 Format

*Note 1:* This log is sent directly to syslog via 'logger' UNIX utility.

*Note 2:* Replace all 'carriage returns' below with '^M' characters in code that generates the log.

```
May 10 18:03:56 host1 pamloginservletHealthMonitor.ksh[pid]: EMSS315  
NONE INFO EMSS
```

```
Location: 191.1.1.1
```

```
Time: May 10 18:03:56 2004
```

```
Category: processingErrorAlarm
```

```
Probable Cause: outOfService
```

```
Component Id: CLASS=SYS;SYSTYPE=SECMon;SECMonComp=WEBSERVICES
```

```
Description: PAM login servlet is unhealthy, restarting WEBSERVICES.
```

### 1.2.3.2 Field Descriptions

Table 1 Field descriptions

| Field          | Value                |
|----------------|----------------------|
| Category       | processingErrorAlarm |
| Severity       | NONE                 |
| LogName        | EMSS                 |
| LogNumber      | 315                  |
| EventType      | INFO                 |
| Probable Cause | outOfService         |

### 1.2.3.3 Description / Explanation

This log is produced when ever the PAM login servlet health monitor detects the PAM login servlet is not functional.

### 1.2.3.4 Recovery Action

The health monitor will automatically try to restart WEBSERVICES via servman if it is running already.

### 1.2.3.5 Additional information

Not applicable.

***Product = IEMS***

## **A00007785--MFT backend Security Services Integration into IEMS**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Introduction**

SN07 IEMS application maintains all the user and group related information in IEMS database. In SN08 the centralized Security Service is provided by MFT backend Security Services. The MFT backend Security Services will be

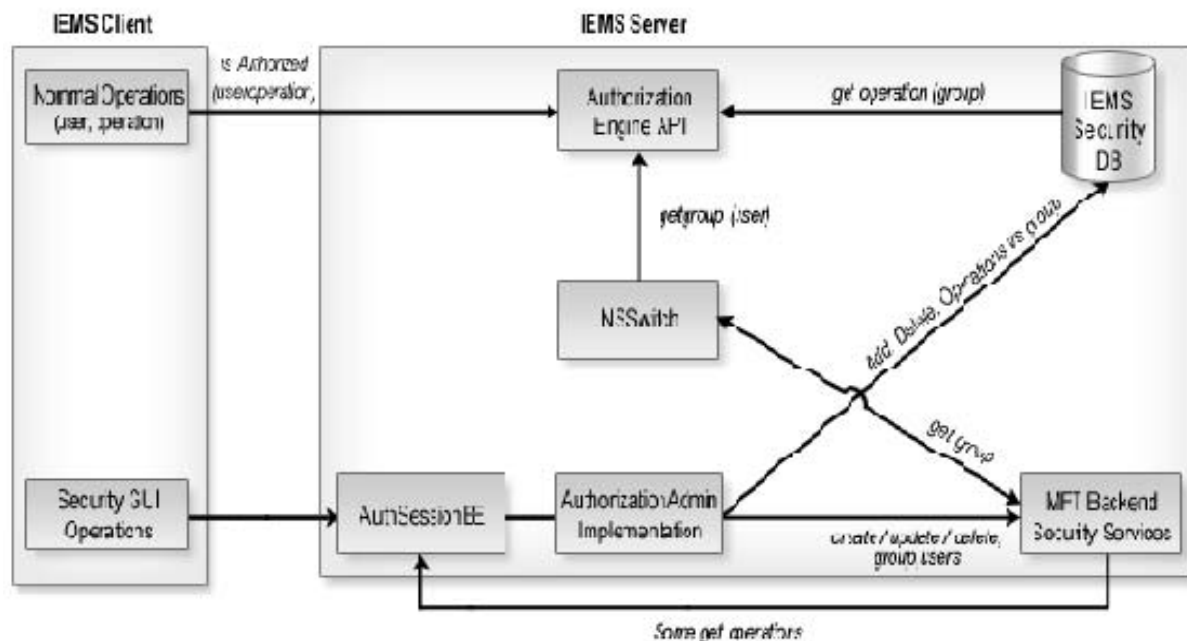
maintaining all the user and group related information, **information that is stored in NSSwitch PASSWORD (including SHADOW) DB and GROUP DB.** This document covers the changes required for the integration of MFT backend Security Services into IEMS.

### 1.3 Acronyms Used

IEMS - Integrated Element Management System

MFTBSS - Management Framework Technologies Backend Security Services

### 1.4 Overview of MFTBSS Integration



In the above diagram the Security GUI related operations will be split into the following two types,

- create, update and delete users (or) groups
- add or delete operations for a group

The create, update and delete users (or) groups will be performed using MFT API's and add or delete operations for a group using our security framework. In the create group case, we have to first add the Group using MFT API's and if the group add success then we add the group related operations using our security framework. We assumed that, the MFT Backend server should be in the **High Availability** mode on a redundant IEMS cluster, **that is, if the local MFT Backend server's DB is not responding the MFT APIs will automatically fail over to use the other MFT Backend server's DB on the inactive unit.** In



case of MFT API calls fails to respond, we will log the MFT failure information.

### 1.4.1 Location of IEMS Server logs:

/opt/nortel/iems/current/logs/secout\*.txt.

Since IEMS Server has log rotation, the name of the file starts with secout.

Sample log would be as below.

“Problem in communicating with MFT Server.Unable to proceed SecurityAdmin operations.”

Similar error messages will be shown in the requesting client. Users will be able to use only the emergency user account, to login into IEMS without the MFT backend Security Services.

## 1.5 Changes

### 1.5.1 Client Side Changes

#### 1.5.1.1 Changes in the Add User Wizard

In the second screen of the Add User Wizard, we can provide the account expiry as an absolute date field, whereas the earlier approach was to enter the number of days from the date of user creation. **Note that this account expiry GUI will be hidden until MFT provides the actual account expiry support.** The password expiry day field, 'The password expires every', now indicates how often (number of days) the user password will expire and not how soon the next password expiry will occur. The password expiry change will take effect after the next password expiry **or the next password change.**

In the Advanced Properties screen which is invoked by clicking on the “Advanced” button in the 3<sup>rd</sup> screen of Add User Wizard, the following fields are present during user addition.

**Note:** Starting SN08, all usernames must be 8 characters or less and must consist of lowercase letters or numeric digits only.

### 1.5.2 Additional User Attributes

- 1 UID: This will have the “AUTO GENERATED” since numerical uid's will be auto-generated for all users. This field will display a read-only UID value for already created accounts.

- 2 **GID:** The primary GID is given as a selectable drop down menu (ComboBox). The default primary GID selected will be “succssn” **for** all the users added during user addition. The administrator can change the primary Group name which is selected by default.
- 3 **GECOS:** Administrator can enter any information in this field, for example the actual full name of the user.
- 4 **LoginShell:** Administrator are given the following options to select for each user created. They are given below.
  - no-access: Users created with this shell, do not have permission to invoke a shell in the system. No-access accounts are mainly for GUI-only user accounts. The actual value of LoginShell in this case is /usr/bin/nash.
  - restricted: Users created with this shell, has command line access to the systems. The actual value of LoginShell in this case is /usr/bin/rash.
- 5 **Home Directory:** The home directory for each user varies according to the Login Shell selected for each user.
  - no-access: /export/home/tmp
  - restricted: /export/home/<username> The <username> is the login name of the created user.
- 6 **MIN:** This is the minimum number of days required between password changes. The default will be (0) days.
- 7 **Password Expiry Date:** This field is a read only field which will indicate the absolute date on which the current password for the user expires.
- 8 **LastChange:** This field show the absolute date on which the password was most recently changed.

**Note:** Account Expiry support is removed from IEMS Security Client GUI. This feature will be enabled after MFT Security Server provides support for Account Expiry

### 1.5.3 Add Group Wizard

In the group add wizard, the administrator has the provision to manually provide a GID for the newly created group. If a value is not provided in the GID field, IEMS will pick a value from the range **specified** in the configuration file.

#### 1.5.3.1 Access permissions to IEMS Security Client GUI

**Only** members of the “secadm” group have access to IEMS Security Client GUI. This applies to JWS Client and the HTML Client. SN07 users who are

present in emsadm group will be automatically be provisioned in secadm group in SN08 during the upgrade process.

*Note:* Starting SN08, all group names must be 8 characters or less and must consist of lowercase letters or numeric digits only.

## 1.6 Server Side Configurable parameters

### 1.6.1 User ID configuration:

The users in MFT BSS are identified by a unique numerical identifier which is generated by IEMS and MFT. This is achieved by providing a UID range in the following configuration file.

```
/opt/nortel/iems/current/conf/NmsProcessesBE.conf
```

The configurable user ID range is highlighted in bold.

```
#java com.adventnet.security.authentication.SecurityProcess
PROCESS com.adventnet.security.authentication.SecurityProcess
ARGS SecurityServerPort 7777 maximum_allowed_login_failed_count 0
userIdRange 10001-12000 groupIdRange 12001-14000
```

The default UID range is 10001-12000.

The above can be changed by the user. When IEMS Server starts up, this value will be read by the IEMS Server. If a user changes the user id range, then IEMS Server must be restarted for the changes to take effect. During each useradd operation from the IEMS Security GUI, a value from the provided range will be automatically selected by IEMS Server and provided to MFT for the user. If the generated user id is exhausted, the user will receive a failure message indicating security database is full. The numerical UID for each user will be generated only by IEMS Server. It cannot be provided by the secadm user. The list of UID's which are freed up as a result of user deletions will be available for enumeration after the enumeration process reaches the upper bound and re-enters the lower bound for finding out free slots.

*Note:* At most 1000 user accounts can be provisioned and managed by IEMS Server. IEMS Server does not support more than 1000 user accounts.

### 1.6.2 Group ID configuration:

The groups in MFT Security Services are identified by a numerical group identifier. The range for the generated group identifier can be provided in the following configuration file in IEMS.

```
/opt/nortel/iems/current/conf/NmsProcessesBE.conf
```

The configurable group ID range is highlighted in bold.

```
#java com.adventnet.security.authentication.SecurityProcess
PROCESS com.adventnet.security.authentication.SecurityProcess
ARGS SecurityServerPort 7777 maximum_allowed_login_failed_count 0
userIdRange 10001-12000 groupIdRange 12001-14000
```

The default GID range can be changed by the user. When IEMS Server starts, this range is read by the IEMS Server. If a user changes the group Id range, then IEMS Server must be restarted for the changes to take effect. During each group add operation, IEMS Server picks up an identifier for the group which is added from the IEMS Security Client GUI from the provided range. If the range is exhausted, then the user will receive a failure message indicating group ID range is exhausted. The secadm user can provide a numerical GID.

### 1.6.3 Password Attributes Support.

The following are the attributes supported by MFT Backend Security Server.

- **sp\_max** - Maximum number of days a password is valid. Password expiration is disabled if sp\_max is set to -1. **It is settable on a per user basis.**
- **sp\_min** - Minimum number of days required between password changes. The restriction is lifted if sp\_min is set to 0. **It is settable on a per user basis.**
- **sp\_warn** - Maximum number of days before the password expiry, the user will be warned. It is supported only as a global configuration, which means that warning value can be set only at the MFT Security Services level common for all users in MFT Security database. Please refer to MFT Security Services documentation on how to change this global parameter via an MFT-provided CLI interface.
- **sp\_expire** - Absolute date (number of days since 1/1/1970) after which the account is disabled. **It is settable on a per user basis.** Account expiry is disabled if sp\_expire is set to -1.

**Note:** sp\_inact –Maximum number of days of inactivity allowed for a user. It is not supported by MFT Security Services.

## 1.7 Migration:

Security Data migration is actually performed in SN08 as a three-part operation. They are given below.

- 1 Data Extraction from IEMS database
- 2 Data Import into MFT Security Services
- 3 Data Clean up in the IEMS database

### 1.7.1 Data Extraction.

This step is performed as part of the installation process. After the installation of MFT & IEMS binaries, this script will be invoked. This will identify the list of users, groups, and the user group relationship. After identifying the information this process will export all the identified data as an XML file in the following location. The script will take the location of the export xml file as an argument. After successful data extraction, the data import will be called by the combo load script which will import data into MFT Security Services.

After the above step, IEMS will be started in the backward compatible mode, with all user and group information in the IEMS DB. During this time the IEMS Security Client cannot be started both in the JWS Client and the Web Client. After the stability of MFT Security Services is ensured, then the clean up script will be called

The following data will be exported to MFT Security Services.

#### 1.7.1.1 List of Data to be exported.

- 1 User with only groups in IEMS DB
- 2 Users with only success group and Solaris groups
- 3 Users with IEMS groups and Solaris groups
- 4 Emergency user is NOT migrated
- 5 IEMS groups
- 6 Solaris groups (non-reserved) containing above listed users
- 7 Migration of user-group associations involving above listed users
- 8 Ability to login via IEMS central account during upgrade (07 backward compatibility mode)

When groups created in IEMS are exported, new GID's will be generated for each group exported to MFT Security Services. Each of the GID will be enumerated from the range provided from the configuration file given below.

```
/opt/nortel/iems/current/conf/NmsProcessesessBE.conf
```

If any group ID is already present in MFT then user has to manually provision the GID for that group. Groups that are imported from Solaris, due to the user group relationship in IEMS, will have the same GID in the XML file which is exported by IEMS.

### 1.7.2 Notes

- 1 During data export process, all usernames/groupnames whose length (no of characters in username/groupname) exceeds 8 characters, will be dropped after generating a security log. Their corresponding user-->group relationship will also be dropped. After each drop a security log will be generated along with all the details of the user / group which are dropped. The admin user can take corrective measures with the input data from the logs.
- 2 During data export process all usernames/groupname will be changed to their corresponding lowercase characters. This change will be reflected in their corresponding user-->group relationship also.
- 3 During data export process all users who are present in emsadm group will be automatically be added to secadm group.
- 4 In SN08, a new authorization group, secadm, is introduced. Members of the secadm group can perform Security Administration functions such as:
  - Adding/Deleting/Users.
  - Adding/Deleting/Modifying Groups
  - Modifying user profiles
  - Modifying IEMS system security settings

## 1.8 Data Import into MFT Security Services.

After data is successfully exported from IEMS database and an XML file created as a result of successful export operation, the combo load script will invoke, the data import script provided by the MFT. Combo load script/MFT team will take care of importing the data successfully into MFT Server.

IEMS Server assumes that all data is successfully exported to MFT when the clean up script is called.

## 1.9 Data Clean up in the IEMS database

During data export all the above given users/groups/user-->group relationship present in the IEMS database is exported to the MFT Security Services through an XML file. After this step, the exported data will be redundant in IEMS

database. So the clean up script is provided to clean up IEMS database of the redundant information. When this script is called, it will clean up the user, group & user group relationship except the emergency user account details from the IEMS database.

All the information given in the (**List of Data to be exported**) section will be cleaned up by the provided clean up script.

**Note:** IEMS Security Client GUI services will not be available when IEMS Server is started in the backward compatible mode. Existing IEMS users will be able to use IEMS Client GUI with the existing account and password information.

But the IEMS Security Client GUI cannot be invoked when the IEMS Server is running in the backward compatible [SN07] mode.

The following message will be shown to the user who invokes the IEMS Security Client when the server is running in backward compatible mode.

*“IEMS is in Upgrade Mode. Cannot allow SecurityAdmin operations”*

### 1.9.1 Emergency User Account:

IEMS Server provides its users with a special account called the emergency user account. This account has all administrative privileges for the IEMS Server, including security administration. The details of this account are maintained by the IEMS Server. When emergency user logs in and if MFT Security Server is available providing service, emergency user [iemsadm] will be able to use IEMS Security GUI interface. If MFT Security Services is not running, then if IEMS Security GUI is invoked, the error message provided by MFT will be displayed to the user.

UserName: iemsadm

Default Password : public

Since the details of this user account are maintained by IEMS Server, this account can be used when the MFT backend Security Service is not available. The administrator should not change the group association of this user. The password may be changed for this account.

### 1.9.2 Password Complexity:

When a user sets/changes his password, the following rules need to be followed. There are 4 class of characters that are allowed in a password. They are listed below.

- Lowercase characters
- Uppercase characters

- Numeric characters
- Special characters.

It is recommended that the password complexity rule requires 3 out of 4 of the above class of characters to be present in any password. The password complexity rules are configurable in the IEMS Server.

The provision for configuration is provided in a configuration file present in the following location.

```
/opt/nortel/iems/current/defaultUserAttribute.prop
```

In addition to the character set restrictions above, the password cannot be the same as the user name or the existing password, and must be at least 6 characters long by default and at most 256 characters long by default.

The following variables are used to configure the password complexity.

- PASSWD\_MIN\_LENGTH=6
- PASSWD\_MAX\_LENGTH=256
- LOWERCASE\_COUNT=1
- UPPERCASE\_COUNT=1
- SPECIAL\_CHAR\_COUNT=0
- NUMBER\_COUNT=1
- SPECIAL\_CHARS=~!@#\$%^&\*()-\_+=[]{}\\|;:'",<.>/?

PASSWD\_MIN\_LENGTH=6 - specifies that the password should have a minimum of 6 characters.

PASSWD\_MAX\_LENGTH=256 - specifies that the password can have a maximum of 256 characters.

LOWERCASE\_COUNT=1 - specifies that the password should have atleast one lowercase character.

UPPERCASE\_COUNT=1 - specifies that the password should have atleast one uppercase character.

SPECIAL\_CHAR\_COUNT=0 - specifies that password need not have a special character.

NUMBER\_COUNT=1 - specifies that the password should have atleast one of the numeric characters.



SPECIAL\_CHARS=~!@#%&\*()-\_+=[]{}\\|;:'",<.>/?

When the password is scanned for special characters, each of the above characters is considered as a special character.

In the above sample the lowercase, uppercase & numeric characters are expected out of the 4(lowercase,uppercase,numeric & special characters).

**Note:** When one of these variables is changed the IEMS JWS Client should be restarted for the changes to take effect.

### 1.10 HTML Client Side:

Since HTML Client provides only minimal support for Security & User administration, Group, Operation provisioning is not provided in the HTML Client. In the HTML Client GUI the administrator will have the options given in Additional User Attributes section above in this document.

### 1.11 References

1. DID for 'MFT Backend security integration'

## *Product = IEMS*

## **A00007786--IEMS Configuration of RADIUS Secret** *Functional Description*

### 1.1 Applicable Solution(s)

UA-IP

### 1.2 Introduction

This document provides an overview of configuring RADIUS secret through IEMS client. The IEMS currently provides provisioning of Network Elements, Element Managers, EMS Platforms, or EMS Applications in one step. Then provisioning of the RADIUS secrets through the CLI in a second step.

The SN08 IEMS will allow provisioning of RADIUS secrets directly through the IEMS in one step, eliminating the need of CLI for RADIUS secrets. IEMS will allow RADIUS secrets to be added, modified, and deleted from the Security Server. The RADIUS Server will be required to store all RADIUS device parameters, and they must be encrypted. No security data will be stored in the IEMS other than the default secrets.

This document also captures the different scenarios of Passport discovery along with the IP Address retrieve for RADIUS secret provisioning.

### 1.3 Acronyms Used

RADIUS - Remote Authentication Dial-In User Service

IEMS - Integrated Element Management System

GUI - Graphical User Interface

EM - Element Manager

NE - Network Element

CLI - Command Line Interface

PAM - Pluggable Authentication Module

### 1.4 RADIUS Secret Provisioning

The RADIUS device parameters for each device are IP address, Type and RADIUS secret. In SN08, IEMS will provide the ability to provision RADIUS secrets directly from the IEMS GUI. All provisioning of RADIUS device parameters including add, modify and delete will be supported while the RADIUS Server is running. Provisioning of RADIUS secrets need to be added to the specific IEMS GUI for the platforms, Element Managers, and NEs that require RADIUS secrets.

The list of PAM-RADIUS clients and RADIUS clients are -

| Security Client Type | Platform/EM/NE                       | RADIUS Device Type | IEMS Version | Comments                                                    |
|----------------------|--------------------------------------|--------------------|--------------|-------------------------------------------------------------|
| PAM-RADIUS           | SSPFS Platform, except CBM           | IEMS               | SN07         | Provision RADIUS secret for cluster IP and units.           |
| PAM-RADIUS           | SDM Platform                         | IEMS               | SN08         |                                                             |
| PAM-RADIUS           | MDM Platform                         | IEMS               | SN08         |                                                             |
| PAM-RADIUS           | Preside MDM Element Mgr              | IEMS               | SN08         | Provision RADIUS secret for the server and client sets too. |
| PAM-RADIUS           | CS2K Core Element Mgr (SDM Platform) | IEMS               | SN08         |                                                             |
| RADIUS               | Passport/MG15000 (previously PVG)    | PASSPORT           | SN08         |                                                             |
| RADIUS               | PP8600                               | PP8600             | SN07         |                                                             |
| RADIUS               | MG9K                                 | MG9K               | SN08         |                                                             |

|  |                 |   |   |                                                                                                                                       |
|--|-----------------|---|---|---------------------------------------------------------------------------------------------------------------------------------------|
|  | CEM Element Mgr | - | - | It is part of the IEMS bundle. It runs on the security server and thus does not use PAM-RADIUS. Hence will not be supported for SN08. |
|--|-----------------|---|---|---------------------------------------------------------------------------------------------------------------------------------------|

RADIUS secrets cannot be provisioned for 6.2 devices. For devices that are newly integrated in SN08, the RADIUS secret cannot be provisioned for their SN07 version. Moreover, only IEMS users belonging to 'SECADM' group, can provision or view the RADIUS secrets. The default RADIUS secret must be encrypted via 3DES/DES and stored in IEMS. In case of RADIUS secret being exchanged between IEMS & MFT Security Services (add, update, retrieve), the secret will be in plaintext, unencrypted format.

## 1.5 Default RADIUS secret

IEMS will provide a GUI for an IEMS admin user to enter the default RADIUS secret for each type of RADIUS device. The various RADIUS device types supported for SN08 are IEMS, MG9k, Passport and PP8600. This screen will be launched from the Security Administration. Only IEMS users with SECADM privilege will have access to this screen.

The default RADIUS secret for each type will be undefined initially. The user will enter the default secret for each type through the GUI. When the value is entered, this RADIUS secret will be encrypted and stored in the IEMS database. It will then be displayed as default secret value for the RADIUS devices that are newly added, according to their type. The Admin user will choose to use the default secret, change it or blank it out (remove it).

The following are the steps to be followed:

- The default RADIUS secret will be entered by the user, in the client GUI. The IEMS client will communicate the default RADIUS secret entered by the user for each type to the IEMS server.
- The IEMS server will store the default secret for each type in the Database in encrypted form.

## 1.6 Operations to be handled

The following operations are to be handled for the RADIUS secret:

### 1.6.1 Add An EMS/EMS Platform/NE

The Tools->Add platform/NE/EM screen has to be modified by including an attribute for the RADIUS secret. A check box will be provided for the attribute. The check box and the attribute should be shown only when the user selects version 7.0 or higher (and not when version 6.2 is selected). For devices that

are newly integrated in SN08, the RADIUS secret attribute will not be applicable to their SN07 version. By default the check box will be enabled, indicating the device uses RADIUS authentication and thus a secret must be provided. IEMS should display the default unencrypted secret value, which the user can modify, if required or clear it. The secret should be displayed only for IEMS users with SECADM privilege.

- On enabling the check box, the secret value must be provided which will be added to the RADIUS server. If a secret value is not provided, IEMS will pop up an error dialog indicating that a secret value should be provided for the device.
- On disabling the check box, IEMS will delete the RADIUS secret if it is already configured for the device.

When the RADIUS secret is set, add a tuple for the IP in the MFT database. IEMS client will send the request for Add operation to the IEMS server. The IEMS server will in turn execute the `configure_radius.sh` with the IP address, type and secret. The script will add the secret corresponding to the IP address in MFT Security Services.

When a tuple is added for the IP address, IEMS will log the same in the security log. A sample security log entry for a successful add operation for user 'IEMSADM' is shown below –

E.g.: *IEMS class\_security.ver01 STAT=SUCCESS SRC.USER=IEMSADM EVNT.TYPE=Radius Parameters added for IP 192.168.4.3, device type IEMS*

The SSPFS Platform and PP8600 NE come under this category.

- **SSPFS Platform:** When manually adding a SSPFS platform with a version that supports RADIUS,
  - All three IP-addresses of a duplex SSPFS platform must be associated with the same RADIUS secret. The RADIUS configuration thus should be associated with the SSPFS cluster and not individual unit.
  - Adding the RADIUS secret for the cluster IP (in duplex case) automatically affects the two other UNIT-IP entries.
  - RADIUS configuration is not available to SSPFS units.

### 1.6.2 Adding Auto-discovered EMS Platforms/NEs

In the case of Auto-discovered EMS Platforms/NEs, IEMS will automatically interface with the Security server to provision the its RADIUS device parameters when the EM is added. The auto-discovered EMS Platforms/NEs that will be supported by this feature for SN08 are MDM Platform, SDM Platform, MG9k, MG15000 (previously PVG)7k, MG15000 (previously PVG)15k and PP15k.

When the EMS is added (whose version supports RADIUS secret)

- The RADIUS check-box will be enabled and the currently configured default RADIUS secret of this EMS device type is displayed.
- The user can optionally modify the default RADIUS secret or accept the default secret of this EMS device type
  - The secrets for its auto-discovered EMS Platforms will be automatically added using the same RADIUS secret specified for their EMS above and RADIUS configuration will be enabled for them, if either IEMS does not know the versions of the auto-discovered EMS Platforms or if their versions do support RADIUS
  - The secrets for its auto-discovered NEs will be automatically added using the current default RADIUS secret of the respective NE device type and RADIUS configuration will be enabled for them, if either IEMS does not know the versions of the auto-discovered NEs or if their versions do support RADIUS
- A requirement for this auto-provisioning to be done for auto-discovered EMS Platforms/NEs is that IEMS must be able to determine their IP addresses. If IEMS cannot determine the IP addresses of the discovered EMS Platforms/NEs, RADIUS secret configuration for them will not be done automatically at discovery. They will be manually provisioned when the IP addresses for the MDM client-server are provisioned
- If the version information is not available for the discovered EMS Platforms/NEs, IEMS should base the decision on the version of the EMS being added.

However, the same is not applicable for Passports/MG15000 (previously PVG)s. There could be many IEMS servers that will have the MDM provisioned but only one will handle the authentication. Hence for an auto-discovered passport, the RADIUS parameters cannot be automatically added. For more details, refer Section 3.3.

When a tuple is added for the IP address in the security server, IEMS will log the same in the security log.

### 1.6.3 Update RADIUS Secrets

The PAM-RADIUS and RADIUS clients (platform/NE/EM) should contain a menu item called “Modify RADIUS secret” that will be used to update the RADIUS secret. For all RADIUS devices, their corresponding unencrypted RADIUS secret value should be fetched from security server and displayed in the RADIUS secret field. The ‘Modify RADIUS secret’ menu item should be shown only to IEMS users with SECADM privilege, when the user selects an EMS/EMS Platform/NE whose version supports RADIUS.

For objects (platform/NE/EMS) that support RADIUS, a check box will also be shown next to the RADIUS secret.

- It will be in DISABLED state if the MFT RADIUS server does not have a secret associated with the IP address of the client.
- Otherwise, the check box will be in ENABLED state with the current unencrypted secret shown.
- When the user wants to provision RADIUS secret for a device for which the secret is not yet provisioned, the check-box needs to be enabled first. It will display a warning message “Radius secret not configured for the device in Radius server, displaying the default value” and display the default Radius secret for the device type. When the user clicks modify, RADIUS secret will be provisioned for the device.

RADIUS secrets for all the EMS/EMS Platforms/NEs can be individually updated. The exception is when EMS and the underlying platform are associated with the same IP address, or when the different IP addresses may be associated with the same host. In this case updating the secret of one automatically affects the other.

When the user modifies the secret value:

- 1 Retrieve the secret value for the IP address from the security server.
- 2 If the secret value is set for a different type than the one existing in the MFT DB, display error. For example, if a secret already exists for the IP with type IEMS, the following will be the error message - “Error: RADIUS secret already existing for IP address 192.168.5.54, device type IEMS. Can not be set for a different type”.
- 3 If the check box is unselected in the GUI, the tuple should be removed from the database.
- 4 Else, a RADIUS secret must be provided and IEMS should update the secret value given in the field, in the security server.

When the RADIUS secret is updated for the IP address in the security server, IEMS will log the same in the security log. A sample log entry for a successful update operation for user IEMSADM is given below –

E.g.: *IEMS class\_security.ver01 STAT=SUCCESS  
SRC.USR=IEMSADM EVNT.TYPE=Radius Parameters updated for IP  
192.168.5.54, device type PP8600*

#### 1.6.4 Delete A RADIUS Device

When a RADIUS device (Platform/NE/EM) is deleted via the existing “Delete Object and Traces” menu item (on right click), check should be done if an

entry exists for the IP address in the MFT DB. If it exists, the tuple corresponding to the IP address should be removed from the MFT DB. If the device is an EM (parent object), the entries corresponding to its NEs (children) should also be removed from the MFT DB. When a duplex SSPFS of version 7 or above is deleted, all three RADIUS entries must be removed. When the EMS is removed, all its auto-discovered EMS platforms or NEs and their RADIUS secrets should be removed automatically.

The delete operation for the IP address should also be logged by IEMS in the security log. A sample log entry for a failed delete operation for user IEMSADM is given below –

*E.g.: IEMS class\_security.ver01 STAT=SUCCESS SRC.USER=IEMSADM  
EVNT.TYPE=Radius Parameters deleted for IP 192.168.4.3, device type  
IEMS*

### 1.6.5 Up-Versioning An EMS/EMS Platform/NE

When the user modifies the version of a non-RADIUS device to a higher version that supports RADIUS secret, using the “Managed Object Property” sheet available on right click of the object, the “Update Radius Secret” menu item of the device should be enabled (on right click).

- On invoking the menu item, the check-box for RADIUS secret will be in disabled state. To provision RADIUS secret for the device, the user should enable it. On enabling, it will display a warning message indicating that Radius secret not configured for the device and display the default RADIUS secret of the device type. The user can optionally modify the default RADIUS secret or accept the default secret of this device type.
- Specific rules for adding SSPFS Platform and auto-discovered EMS Platform/NE apply in the case of up-versioning a device. In particular,
  - When a duplex SSPFS is up-versioned to version 7 or above, all three RADIUS entries must be added and RADIUS configuration enabled.
  - In case of auto-discovered EMS platforms/NEs (except Passports/MG15000 (previously PVG)s)
    - The secrets for its auto-discovered EMS Platforms will be automatically added using the same RADIUS secret specified for their EMS above and RADIUS configuration will be enabled for them, if either IEMS does not know the versions of the auto-discovered EMS Platforms or if their versions do support RADIUS



- The secrets for its auto-discovered NEs will be automatically added using the current default RADIUS secret of the respective NE device type and RADIUS configuration will be enabled for them, if either IEMS does not know the versions of the auto-discovered NEs or if their versions do support RADIUS.
- The secrets for auto-discovered Passports/MG15000 (previously PVG)s will not be automatically added. The devices will be displayed in the 'Passport RADIUS Authentication' tool and need to be manually selected and configured for RADIUS secrets.

#### **1.6.6 Down-Versioning An EMS/EMS Platform/NE**

When the user modifies the version of a RADIUS device to a lower version that does not support RADIUS secret, using the "Managed Object Property" sheet available on right click of the object, the "Update Radius Secret" menu item of the device should be disabled (on right click). Also the RADIUS secret provisioned for the device should be removed automatically.

When a duplex SSPFS is down-versioned to version 6.2 or below, all three RADIUS entries must be deleted and RADIUS configuration disabled.

When MDM Mgr is down-versioned to version 7 or below, all MDM Platforms and Passports/MG15000 (previously PVG)s that were auto-discovered through this MDM Mgr and were selected for authentication by this running IEMS security server will have their RADIUS secrets removed from this IEMS security server and RADIUS configuration disabled.

### **1.7 Centralized MDM/Passport Authentication**

Since there can be many IEMS servers with the MDM provisioned and only one of IEMS servers manages different Passports/MG15000 (previously PVG)s under the MDM manager, in order to enable only one to handle the authentication, the RADIUS parameters for the Passports/MG15000 (previously PVG)s will not be added to the security server during auto-discovery. A centralized RADIUS authentication for Passports/MG15000 (previously PVG)s will be supported in the IEMS GUI. A screen "Passport RADIUS Authentication", which will display all discovered Passports for the MDM, will be provided. This screen will be launched from IEMS client->Tools menu.

The passport devices will have an "authenticate" checkbox against each of them. The user will check all the Passports/MG15000 (previously PVG)s that will be authenticated by the running IEMS security server. The RADIUS device parameters for all the checked Passports will be added to the security server. For all unchecked Passports, the RADIUS device parameters will be deleted from the Security Server.



The add and delete operations of RADIUS device parameters for Passports is feasible only if they are discovered with IP-Address. Before SN08, IEMS does not retrieve the IP-Address of the MDM auto-discovered Passports/MG15000 (previously PVG)s. In SN08, the IP-Address of the Passports will be required for functionalities such as Passport Command Line launch and RADIUS secret provisioning.

The add and delete operations of RADIUS device parameters for Passports will be logged by the IEMS in the security log.

## 1.8 Passport Discovery

The different scenarios of the Passport discovery and the IP Address retrieve are as follows:

### 1.8.1 Retrieval of IP-Address

IEMS will use the following API to populate the IP-Address of the Passports/MG15000 (previously PVG)s

- `_cmd: ACTION`
- `_obj_type: server`
- `_obj_id: serverId S GMDR`
- `_action_type: queryProperty`
- `_attr: compId NI EM *`
- `_attr: propName S NortelMomsProxyIPAddress`

A sample response message is given below -

```
_obj_class: server
_obj_id: serverId S FMDR_AESTEST@wcary3r6
_time: 2004 10 06 02 01 29
_attr: compId NI EM NEPALX
_attr: propName S NortelMomsProxyIPAddress
_attr: propValue S 47.138.180.194
```

```
_obj_class: server
_obj_id: serverId S FMDR_RTP@wcary3r6
_time: 2004 10 06 02 01 29
_attr: compId NI EM CAPEFEAR
_attr: propName S NortelMomsProxyIPAddress
_attr: propValue S 47.142.102.138
```

```
_obj_class: server
_obj_id: serverId S FMDR_RTP@wcary3r6
_time: 2004 10 06 02 01 29
```

```
_attr: compId NI EM CLEVELAND  
_attr: propName S NortelMomsProxyIPAddress  
_attr: propValue S 47.43.160.59
```

IEMS will parse the response to retrieve the IP-Address and assign it against the corresponding Passports.

### 1.8.2 Various Scenarios In Passport Discovery

- **Adding Passports:** Administrator or Craft person has to initiate the Resynchronization of Inventory manually in order to add the newly discovered Passport in the IEMS database.
- **When Passport name changes:** Administrator or Craft person has to initiate the Resynchronization of Inventory manually in order to update the new name of that Passport in the IEMS database.
- **When Passport IP-Address changes:** Administrator or Craft person has to initiate the Resynchronization of Inventory manually in order to update the new IP-Address of that Passport in the IEMS database.
- **When the Passport removed:** Administrator or Craft person has to initiate the Resynchronization of Inventory manually in order to remove that Passport from IEMS database.

## 1.9 Test Considerations

- Duplex IEMS servers are required running version 7.0 or greater.
- The different scenarios in Passport discovery should be captured while testing so that the Passports in the Network are always in sync with the IEMS Database.

## 1.10 Open Items

The IP-Address of MDM Platforms is not obtained. Provisioning of RADIUS secrets for MDM platforms can be done only if their IP-Address is obtained.

## 1.11 References

DID for Config RADIUS secret **A00007786\_-**  
**\_IEMS\_Config\_RADIUS\_secret\_(2061)\_v2.pdf** [Stephen Dreyer]

## ***Product = IEMS***

### **A00008907--Key Changes for CEM Logs**

#### ***Corrective CAF***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Purpose**

This corrective CAF is being created to churn in late requirements received while doing the ICAF A00007347, IEMS - CEM INTEGRATION INTO IEMS (POI 2050). The requirements concern a change of format for northbound events on the log feeds of IEMS, Integrated Element Management System, when used in conjunction with CEM, Core Element Manager. Also it addresses the functionality addition of addrep and delrep of logs from the SSPFS machine so the CEM will or will not process the logs.

#### **1.3 Description of Changes**

There are three main places the craft person will see differences with this corrective CAF.

- 1) The log in the IEMS GUI will be altered to CSEM 300, reflecting #2 immediately following.
- 2) The northbound feeds from IEMS will have new fields placed in them:
  - populate the logkey field with logname/number
  - populate the logname field with “CSEM”
  - populate the lognumber field with “300” for alarm sets and clears and “600” for info logs or unmapped logs
  - populate the eventtype field with “TBL” on raise and “INFO” on clear and “INFO” for unmapped logs
  - populate the eventlabel field with “Alarm set” on raise and “Alarm clear” on clear and “Log” for unmapped logs
  - populate the specificproblem field with the probable cause
  - populate the “bodytext” field with:
    - Equipment Id: <equipmentID>
    - Notification Id: <alarmindex>
    - Category: <category>

- Cause: <probablecause>
- Severity: <severity>
- Component Id: <componentid>
- Log Key: <logkey>
- Description:
- <mmessage>

each line should have eight leading blanks

3) The user can addrep/delrep logs that the CEM will receive from the CORE.

## 1.4 Description of Fix

### 1.4.1 Log Key changes:

The design was a printstring of the new fields listed above at the head of the body field. Then the data was written to the database as previously done.

### 1.4.2 Addrep/Delrep

#### 1.4.2.1 CEM Server process:

A new process is introduced to collect input from the user on whether to add or drop logs. Also the log type and log number to add or drop is taken as input. The process writes the log type and number along with the format so it can be mapped into the CEM GUI.

#### 1.4.2.2 SDM/CBM process:

A new process is introduced which waits for a message from the server process. On receiving the message the desired operation of adding or dropping logs is performed with the help of a script (newly written). The script updates part of the SDM/CBM base and restarts the logDelivery process.

## 1.5 Related Documentation

A00007302 - IEMS - CEM Integration

A00007304 - CEM I&C on IEMS

A00007347-IEMS - CEM Integration

and this document is in folder

A00008907 - CEM Log Key Changes for CEM (CCAF)







# SN08 Feature Deltas

***Product = MG 9000***

## **A00005561--MG9K Internet Protocol Security**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

This feature implements IP security and user authentication capabilities on the MG9K. There are two broad goals, first is to ensure that all users, local and remote, are validated before access is granted to a MG9K node. Secondly, all IP traffic between the MG9K and a remote peer (Element Manager or Gateway Controller) will be authenticated. These goals will be accomplished by authenticating user through a RADIUS client/server network. IP traffic will be protected with IP Security suites. As a result of this feature all peers connecting to the MG9K will also need to enable IP Security unless an explicit bypass policy is in place. Notably, the Element Manager and the Gateway Controller are affected and are the only devices that currently have to implement IPSec. Other devices that access the MG9K will do so with other secure protocols such as SSL, or SFT. See the following figure. The MG9K Security parameters can be configured from the LCI at initial commissioning or from the Element Manager.

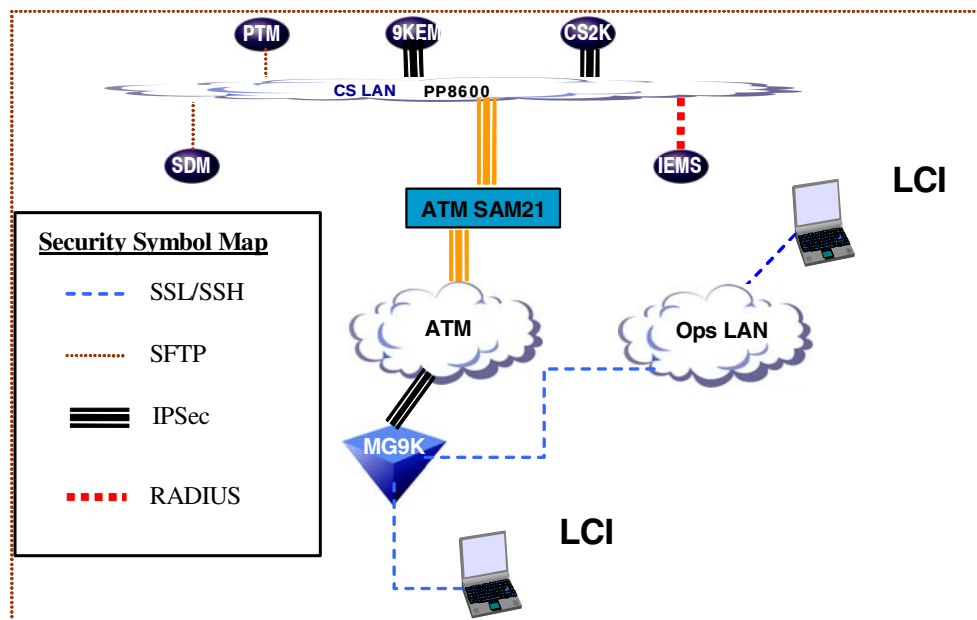


**Figure 9 IP Security Network**

The security features are enabled when the MG9K node is commissioned via the Local Craft Interface (LCI). One of the first steps is to configure the shared keys between the MG9K and its Element Manager and the key shared with GWC if known. Shared keys are protected in three ways by the MG9K. The key, of size TBD, is protected from being displayed on the LCI and EM. The same key has to be entered twice before it is accepted by the GUI, and it is stored in an encrypted format. The key is also never transmitted insecurely over the network.

The Local Craft Interface and the Element Manager are used to enable and configure MG9K security features. Configuration is done on a per-network element basis. There is no flow thru of the security options. Therefore careful coordination is required when security is enabled on codependent devices.

Below are sample LCI Security configuration screen shots. The Element Manager interfaces will be discussed in a separate document.



## 1.2.1 RADIUS Configuration

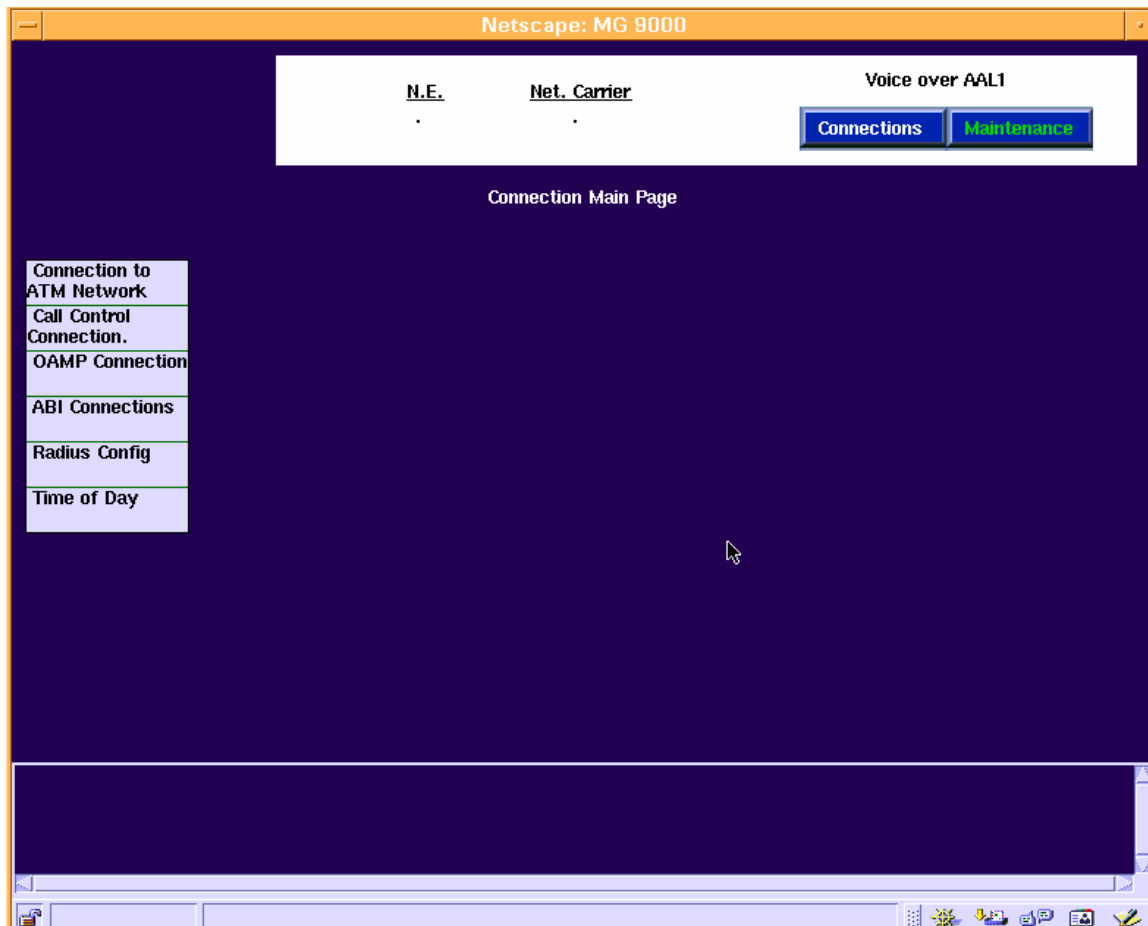


Figure 10 RADIUS Configuration

Netscape: MG 9000

N.E.      Net. Carrier      Voice over AAL1

•      •

Connections Maintenance

RADIUS Configuration

Primary IEMS Address

Secondary IEMS Address

Primary IEMS Shared Key

Secondary IEMS Shared Key

Submit Query

Figure 11 RADIUS Parameter set

## 1.2.2 IP Security Configuration

Netscape: MG 9000

N.E. Net. Carrier

Voice over AAL1

Connections Maintenance

Frame #1 Shelf #3 Select:

select a shelf view

frame #1 shelf #3

FRAME

SIC DS1 16pt DS1 16pt LC LC DCC DCC ITP ITP ITX ITX DS1 16pt DS1 16pt

IPSec Configuration

Peer IP Address

Lifetime

Shared Key

☒ Enable Security?

Submit Query

Figure 12 IP Security Parameter set

Table 3 Configuration Summary

|   | Action                                                        | Description | Expected Results                                                                                           |
|---|---------------------------------------------------------------|-------------|------------------------------------------------------------------------------------------------------------|
| 1 | Craft person logs on to MG9K Node with default Admin password |             | User authenticated locally on MG9K. (No access to RADIUS server). Access permitted if password is correct. |

|   |                                    |                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                        |
|---|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2 | Set Security parameters            | <ol style="list-style-type: none"> <li>1 Enable Security</li> <li>2 Set Element Manager's Pre-shared Key</li> <li>3 Set IP addresses of RADIUS Servers</li> <li>4 Set GWC Preshared Key if known</li> <li>5 Change Default Admin password if desired.</li> </ol> |                                                                                                                                                                                                                        |
| 3 | Continue normal MG9K commissioning |                                                                                                                                                                                                                                                                  | <p>When the WAN interface becomes operational, links to the EM and GWC will be secured with IPSec. (Secure link establishment continues until success)</p> <p>MG9K sends a cold start trap to trigger EM discover.</p> |
| 4 | VMG Provisioning                   |                                                                                                                                                                                                                                                                  | EM to set GWC-GW pre-shared key                                                                                                                                                                                        |

### 1.2.3 Alarms, Logs, and Statistics

#### 1.2.3.1 Security Alarms (displayed at the EM and the LCI)

- Non-responsive RADIUS Server
- Expired Links to Security Peers
- Replayed Packet threshold
- Packet Discard threshold

#### 1.2.3.2 Security events logs (accessible at the EM)

- IKE negotiation errors
  - Key mismatch
  - Proposal errors
  - Time out
- IP packet authentication failures
- Packet discard
- Replayed packets

**1.2.3.3 Security statistics**

Number of Packets

- Transmitted
- Received
- Discarded

**1.3 2.3 Applicable customer facing sections**

Fault Management:

Not Applicable

Logs

Alarms

Configuration:

Not Applicable

Data Schema/MIBs

User Interface

GUI

Element Management

Local Craft Interface

Security

Service Order

SOC

Office Parameters

Upgrades impact

Accounting

Not Applicable

Billing changes

Performance

Not Applicable

Operational Measurements

Performance Measurements     X    

## 1.4 Hardware Requirements or Dependencies

None

## 1.5 Software Requirements or Dependencies

IP Security on the MG9K runs in concert with security enabled on the Element Manager and GWC.

## 1.6 Limitations and restrictions

None

## 1.7 Interactions

None

## 1.8 Glossary

| Term     | Description |
|----------|-------------|
| New term | Definition  |

***Product = MG 9000***

## **A00005646--IPSEC with MG9000 Element Manager**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

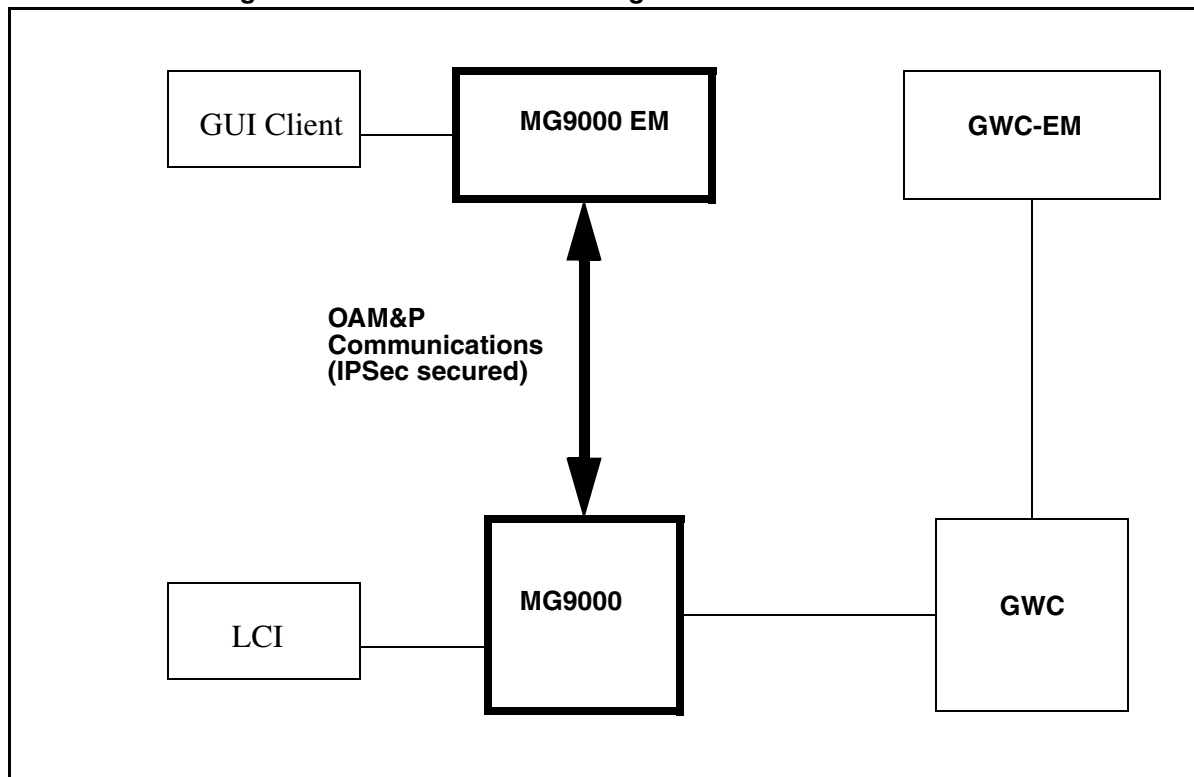
#### **1.2 Description**

This feature implements IPSec for MG9000 Element Manager to MG9000 Line Gateway OAMP communications. The craftsperson will be able to independently manage IPSec parameters for all OAM&P communications to and from MG9000 network elements. This feature will enable/disable/modify IPSec on the OAM&P messaging channel from the MG9000 EM to an MG9000. Encryption (Confidentiality) may not be enabled in this release as it is not supported by the MG9000 Line Gateway.

The MG9K Element Manager will be used to manage IPSec security associations on the server-side portion of the OAM&P communications. The

MG9000's LCI will be used to manage IPsec security associations on the gateway-side of the OAM&P communications. See Figure 1.

**Figure 13 Desired Behavior Diagram**



For securing the OAM&P communications channel on the MG9000EM, a new **Security View** will be made available from the MG9000 EM subnet. This GUI will manage the IPsec (and Internet Key Exchange) configuration file(s) that are present in the SSPFS common platform. Parameters in these files are used to setup security associations, keys, and protection mechanisms. Enforcement of IPsec policies will be system-wide and per-socket as provided by the Solaris IPsec implementation. The craftsman will not be limited to securing the EM to GW connection, but will be able to manage all network connectivity in and out of the MG9000 Element Manager Server.

Also the **Office Wide Defaults View** is changed to support IPsec. This will enable the customer to configure one set of IPsec parameters and have them applied to all, or a subset of, the provisioned MG9000s.

This feature does not affect security on the MG9000 Element Manager Mid-Tier or client machines. All security views in the MG9000EM will only be accessible from EMSADM login class.

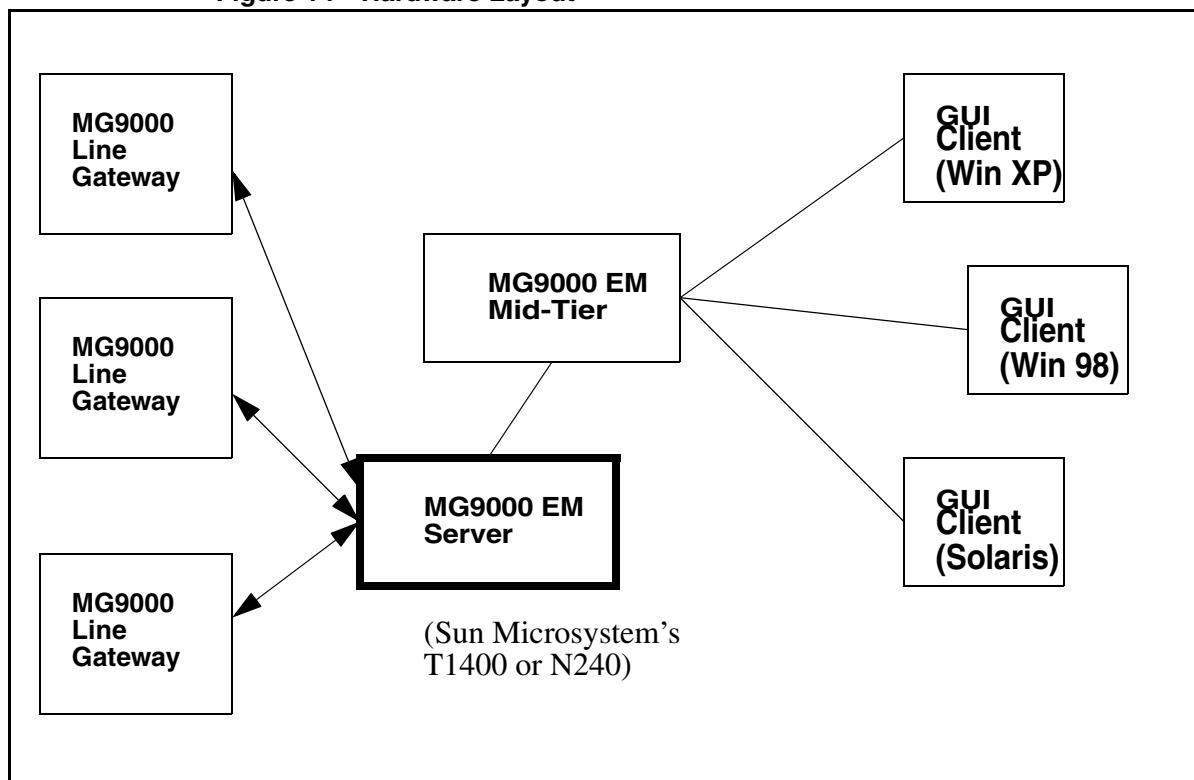
For proper operation of IPsec, all security parameters provisioned for an MG9000 Network Element in the Element Manager **MUST** also be

provisioned in the corresponding MG9000 Line Gateway. **IF THE PARAMETERS DO NOT MATCH, COMMUNICATIONS BETWEEN THE GATEWAY AND ELEMENT MANAGER WILL NOT BE POSSIBLE.**

### 1.3 Hardware Requirements or Dependencies

No new hardware is being introduced by this feature. Existing Sun Microsystems T1400 and N240 hardware used as MG9000 EM server platform will be used.

Figure 14 Hardware Layout



### 1.4 Software Requirements or Dependencies

SN008 release or later of the MG9000EM application will support IPsec.

Software loads in the MG9000 Line Gateway will be SN008 release or later.

### 1.5 Limitations and restrictions

#### 1.5.1 Security

For proper operation of IPsec, all security parameters provisioned for an MG9000 Network Element in the Element Manager **MUST** also be



provisioned in the corresponding MG9000 Line Gateway. **IF THE PARAMETERS DO NOT MATCH, COMMUNICATIONS BETWEEN THE GATEWAY AND ELEMENT MANAGER WILL NOT BE POSSIBLE.**

### 1.5.2 IPsec Precedence Order

If the IPsec configuration contains multiple policy entries, for example, they are assumed to be listed in the order in which they are to be applied. In cases of multiple entries matching the outbound and inbound datagram, the first match will be taken. The system will reorder the policy entry, that is, add the new entry before the old entry, only when:

- The level of protection is “stronger” than the old level of protection. Currently, strength is defined as:

AH and ESP > ESP > AH

Entries with both AH and ESP present in the policy entry protection are ordered after all the entries with AH and ESP and before any AH-only and ESP-only entries.

- If the new entry has bypass as action, bypass has the highest precedence. It can be added in any order, and the system will still match all the bypass entries before matching any other entries.

In all other cases the order specified by the user is not modified, that is, newer entries are added at the end of all the old entries.

A new entry is considered duplicate of the old entry if an old entry matches the same traffic pattern as the new entry.

### 1.5.3 IP Addresses

No IPv6 128 bit format IP addresses will be supported, only IPv4 (xxx.xxx.xxx.xxx) format 32 bit addresses will be supported.

## 1.6 Interactions

No interactions between IPsec and existing features will be seen by the craftsperson.

## 1.7 Applicable customer facing sections

Fault Management

Logs

\_\_X\_\_

Alarms

\_\_X\_\_

Configuration

|                                                 |         |
|-------------------------------------------------|---------|
| Data Schema                                     | __N/A__ |
| User Interface                                  | __X__   |
| Element Management                              | __N/A__ |
| Security                                        | __X__   |
| Service Order                                   | __N/A__ |
| Office Parameters                               | __N/A__ |
| Accounting (includes AMA billing)               | __N/A__ |
| Performance (includes operational measurements) | __N/A__ |

## 1.8 Glossary

| Term  | Description              |
|-------|--------------------------|
| GWC   | Gateway Controller       |
| GUI   | Graphical User Interface |
| IPSec | IP Security              |

## 2: Fault Management for A00005646

### 2.1 Fault management strategy

The standard MG9k EM Fault Management strategy will apply to the faults for MG9kEM IPSec and Overload Controls. Alarms will be displayed by the MG9K EM Alarm Browser, logged in NT standard format to the SSPFS CUST logs and forwarded to northbound OSS.

In support of the MG9K EM - MG9K IPSec connection, there will be new faults added to indicate threshold crossing and link issues.

For the MG9k EM Overload Controls feature there will not be any new faults added. However, existing faults for the DCC which indicate threshold crossing and overload detection will now also apply to the ITP and ABI.

### 2.2 Fault management tools and utilities

TBD (IPSEC)

Alarm Browser - Reports alarms from registered events. When an alarm is generated, it is displayed in the Alarm Browser along with the date, time, the NE Id, the generating resource information, the severity and the probable cause. Highlighting the alarm displays the description of the alarm in the text box at the bottom of the Alarm Browser.

Log Adaptor - Generates logs from registered events. The log names and numbers are predetermined and are matched with the incoming event. A log with the corresponding name and number which contains the date, time, physical location, severity and any other pertinent information is generated and placed into a separate file.

## 2.3 Logs

### 2.3.1 IPsec syslog messages

The Solaris implementation of IPsec automatically sends all failure logs to syslog /var/adm/messages. We do not have control over this. However when the servlet makes any changes to the IPsec security rules, the wrapper scripts will output any attempted changes to /var/log/securitylog.

The Solaris IPsec itself does not seem to generate any failure messages because security could be compromised, however IKE does seem to generate failure messages to syslog.

Sample IKE failure message would look like this.

```
messages.0:Mar 25 15:40:04 wnc1s01h /usr/lib/inet/in.iked: [ID
313954 daemon.notice] IKE_DELETE_PAYLOAD_RECEIVED:
20040325204004: Source addr:47.142.217.23 Destination
addr:47.142.217.22 SPI:0x0100005d350a7d6c0100006b743037d4
Description:Received delete notification
```

All other possible failure messages that could get generated to syslog is shown below for IKE.

```
IKE_AH_IP_FRAGMENT
IKE_AH_SA_LOOKUP_FAILURE
IKE_AH_SEQUENCE_NUMBER_FAILURE
IKE_AH_ICV_FAILURE
IKE_ESP_SEQUENCE_NUMBER_OVERFLOW
IKE_ESP_IP_FRAGMENT
IKE_ESP_SA_LOOKUP_FAILURE,
IKE_ESP_SEQUENCE_NUMBER_FAILURE
IKE_ESP_ICV_FAILURE
IKE_INVALID_COOKIE
IKE_INVALID_ISAKMP_VERSION
IKE_INVALID_EXCHANGE_TYPE
IKE_INVALID_FLAGS
```

IKE\_INVALID\_MESSAGE\_ID  
IKE\_INVALID\_NEXT\_PAYLOAD  
IKE\_INVALID\_RESERVED\_FIELD  
IKE\_INVALID\_DOI  
IKE\_INVALID\_SITUATION  
IKE\_INVALID\_PROPOSAL  
IKE\_INVALID\_SPI  
IKE\_INVALID\_TRANSFORM  
IKE\_INVALID\_ATTRIBUTES  
IKE\_INVALID\_KEY\_INFORMATION  
IKE\_INVALID\_ID\_INFORMATION  
IKE\_INVALID\_CERTIFICATE  
IKE\_INVALID\_CERTIFICATE\_TYPE  
IKE\_INVALID\_CERTIFICATE\_AUTHORITY  
IKE\_INVALID\_HASH\_INFORMATION  
IKE\_INVALID\_HASH\_VALUE  
IKE\_INVALID\_SIGNATURE\_INFORMATION  
IKE\_INVALID\_SIGNATURE\_VALUE  
IKE\_INVALID\_PROTOCOL\_ID  
IKE\_INVALID\_MESSAGE\_TYPE  
IKE\_CERTIFICATE\_TYPE\_UNSUPPORTED  
IKE\_CERTIFICATE\_UNAVAILABLE  
IKE\_NOTIFICATION\_PAYLOAD\_RECEIVED  
IKE\_DELETE\_PAYLOAD\_RECEIVED  
IKE\_UNEQUAL\_PAYLOAD\_LENGTHS  
IKE\_BAD\_PROPOSAL\_SYNTAX  
IKE\_RETRY\_LIMIT\_REACHED

### 2.3.2 ITP/ABI Overload Controls.

The behavior for the logs for the ITP/ABI Overload Controls will be exactly the same as that implemented for the DCC Card in SN06.2. Please refer to the document titled Fault Management - MG9k EM Overload Controls (A00002007) for more details regarding these logs.

These are new alarms that will be generated by the MG9000.

- Unable to communicate with RADIUS Server
- Secure link Down w GWC
- Packet Discard (depends on the threshold set)
- Overload Controls. The alarms for the ABI and ITP Overload Controls are exactly same as those documented for the DCC Card in 6.2. The only difference being that these alarms will now also apply to the ABI & ITP Card as well as the DCC Card. Please refer to the document titled Fault Management - MG9k EM Overload Controls (A00002007) for more details regarding these alarms.

The following logs will be thresholds in the MG9000. When the threshold is crossed an alarm will be generated

**1. Logging Event**

- Sequence\_Number\_Overflow
- Life\_Time\_Expired, Type = SoftlHard

**2. Security Policy Database**

- SAD\_Discard\_Policy:- Direction (in/outbound)
- SAD\_Lookup\_Fail, info needed:- Direction (in/out bound):- Sub-info field invalid SPI, Replayed packet

**3. IKE**

- IKE\_Main\_Mode-Failed, Mismatched PSK
- IKE\_Quick\_Mode-Failed, Proposal mismatch, NULL ESP & authentication = null, en/decryption failures
- IKE\_Packet Discarded, decryption errors, Auth errors

**4. IPsec Security Association**

- SA\_Decryption\_Error
- SA\_Authentication\_Error

## **2.4 Related documentation**

1. Fault Management - MG9kEM Overload Controls (A0002007) Bobby Robinson (SN06.2)

## **3: Configuration for A00005646**

## 3.1 Hardware and Software Requirements

SN08 or later software load for both the MG9000 and Element manager.

## 3.2 Initial Configuration

### 3.2.1 Security

From a high-level here are the steps to enable security on the OAM&P and call control links.

1. Load both MG9000 and MG9000 Element Manager with required software.
2. When commissioning the MG9000, thru the LCI, the craftsperson will enable security on the management link to the Element Manager.
3. The craftsperson will then use a web browser and connect to the MG9000 Element Manager server machine. (Not the Mid-Tier machine) After logging in, the craftsperson will enable security on communications with the MG9000 IP address.
4. Cold start from MG9000 or manual discovery from Element Manager.
5. This will complete securing the OAM&P link.
6. From SESM, enable security on the Gateway Controller.
7. From the SLOA GUI, provision a VMG. Enable security on the GW Controller Config tab.
8. This will complete securing the Call Control link.

#### 3.2.1.1 MG9000

The LCI's IPSec and IKE security parameters must match the parameters provisioned through the SSPFS security servlet.

VMG IKE configuration parameters that are provisioned, via the Element Manager's SLOA GUI, must match the corresponding IKE parameters on the GWC.

#### 3.2.1.2 MG9000 Element Manager

IPSec and IKE configuration parameters that are provisioned, via the SSPFS security servlet, must match the corresponding IPSec and IKE parameters on the MG9000, provisioned via the LCI.

### 3.2.2 MG9kEM SN008 Installation

If a user is upgrading from SN06.2 to SN008, the steps to upgrade are the same as they would be for SN06.2 to SN07.

If the user is upgrading from SN07 to SN008 - an additional step will be added to prompt the user to backup the table space for SN07.

As of SN008 the MG9kEM will continue to use the same tablespace as the previous release - with alters applied. Therefore in order to be able to roll back a MG9kEM release to SN07 from SN008 (if necessary)- the table space must be backed up prior to starting the SN008 MG9kEM.

### 3.3 Office/Subnet parameters (OP/SP) (CM & SESM)

Not applicable

## 3.4 Upgrade Impact

### 3.4.1 Dump and Restore

If the user is upgrading from SN06.2 to SN008 - the steps for upgrade are the same as they would be for SN06.2 to SN07.

If the user is upgrading from SN07 to SN008, things change. As of SN008, we no longer will be running multiple versions of the EM. The EM will now use ONE tablespace from SN07 forward - with alters applied to support each new release. This means that the data from that tablespace for SN07 must be backed up prior to starting up the SN008 product. The script to backup the table space, mg9kem\_db\_backup.sh, and a mechanism to invoke this script will be provided.

If it is necessary to rollback to SN07, the use of the script mg9kem\_db\_restore.sh must be employed to restore the tablespace to its previous SN07 database schema and data set.

For SN06.2 to SN008 upgrades - the mechanism for exporting from SN06.2 and importing to SN008 will still be required. (See CN document for A00003074 which documents these steps.)

For SN07 to SN008 - no data export or import is necessary. The SN008 will attach to the existing SN07 tablespace and recover and use the network elements and data directly from that space.

### 3.4.2 Element Management Major Upgrade

If upgrading from SN06.2 directly to SN008 - the upgrade steps are exactly the same as they would be for SN06.2 to SN07.

If upgrading from SN07 to SN008, one modification to the way upgrades work is that the user is no longer required to move from one MG9kEM version to another if upgrading a MG9k from SN07 to SN008. The SN008 MG9kEM suite can handle discover and management of a MG9k Gateway running an SN07 load.

For SN07 to SN008, the steps will be install the SN008 package, backup the SN07 tablespace, start the SN008 MG9kEM. No data transfer steps are required.

One break in the way the MG9kEM can be run is that once SN008 has been started - the user cannot go back to using the SN07 Element Manager without restoring the previous database. It is not allowed to have SN07 MG9kEM and SN008 EM running at the same time, or to switch back and forth.

The Major upgrade from SN07 to SN008 is intended to be very similar in steps to that of a MR Upgrade.

### 3.4.3 Element Management MR Upgrade

The same steps as were done to support an SN07 MR Upgrade will apply to SN008.

## 3.5 Data schema (DS) (CM, MIBS, RDB)

The NORTEL-UEMG-PERFMON-MIB will be modified so the simple names of the items for Thresholds and Overload will be modified to no longer reference the DCC.

New Mib for the VMG provisioning of IP Sec: TBD

## 3.6 OSS Changes

In previous releases the northbound interfaces were required to change the prefix for their event channels and fault manager entries. In SN06.2 the prefix was Subnet\_62. With SN07 the entry changed to Subnet\_7.

As of SN08, there will NO LONGER be the need to change this prefix in the northbound interfaces. As of SN08 - the MG9kEM will henceforth use Subnet\_7 as its prefix.

Example ORB entry changes:

SN06.2

EventChannel = "Subnet\_62.ec.Oss"

FaultServiceManger = "Subnet\_62.Service.FaultServiceManager"

SN07

EventChannel = "Subnet\_7.ecc.Oss"

FaultServiceManager = "Subnet\_7.Services.FaultServiceManager"

SN08

EventChannel = "**Subnet\_7**.ecc.Oss"

FaultServiceManager = "**Subnet\_7**.Services.FaultServiceManager"



The reason we can now do this is that SN07 and SN08 will NEVER be running at the same time. When SN08 is deployed - it will also use the same prefix (Subnet\_7). This is because at any given time only ONE instance of these (SN07, SN08) - may be running on a server.

### 3.7 External Interface Changes

With SN07 the TL1 Adaptor for SN07 was required to change its connecting port to 2363. This port will not be required to change for SN08 and will remain at 2363.

In SN07, the EM's SNMP listening port was modified to be 8002. This will not change for SN08. The SNMP port will be 8002.

### 3.8 MG9000 Element Management

#### 3.8.1 New/modified GUIs

From the current SLOA GUI, the craftsperson will be able to enable or disable IPSec and IKE on the call control channel from the MG9000's ITP to gateway controller.

The craftsperson will have the option of using Office Wide Defaults for the VMG security parameters. The defaults will be managed from, oddly enough, the current Office Wide Defaults GUI.

A new HTML security web page is available for the craftsperson to use to secure the MG9000 Element Manager server machine. Using the interface, secure communication with the MG9000 is possible.

In regards to the addition of ABI/ITP Overload Controls, the same Overload Threshold Pane that is now in existence for the DCC Cards will be applied to the ITP/ABI Cards. The user may access this via the existing Manage Thresholds functionality.

#### 3.8.2 GUI information

##### 3.8.2.1 GUI name: Office Wide Defaults

Office Wide Defaults

##### 3.8.2.1.1 Functional description

This GUI will be used to define default security parameters that may be used during VMG provisioned. These parameters will be used in securing the call control link between the VMG and the gateway controller.

Added to the Office Wide Defaults GUI will be a section for Security. This section will have three parameters:

1. Security OFF, ON
2. IKE preshared key
3. IKE time to live

### 3.8.2.1.2 GUI usage and implications

Office Wide defaults should be assigned first before provisioning VMGs.

### 3.8.2.1.3 GUI fields

The following table lists the security fields for Office Wide Defaults GUI.

**Table 1 GUI field descriptions**

| Field            | New or Changed | Subfield | Entry                | Explanation and action                                                     | Associated MIB entry |
|------------------|----------------|----------|----------------------|----------------------------------------------------------------------------|----------------------|
| Security         | New            | No       | OFF, ON              | Default = OFF<br><br>Indicates whether or not security is enabled.         | TBD                  |
| IKE Preshare key | New            | No       | 26 digit HEX string? | Preshared key used in the IKE establishment of a secure call control link. | TBD                  |
| IKE Time To Live | New            | No       | Non-negative integer | How long the currently established security session will last?             | TBD                  |

### 3.8.2.1.4 Usage example

The following example shows sample datafill for the Office Wide Defaults GUI:

*Screenshot of the Office Wide Defaults GUI with IPSec parameters shown to be provided later.*

### 3.8.2.1.5 GUI release history update

The following information was added:

Security section added to Office Wide Defaults GUI.

### 3.8.2.1.6 Supplementary information

None

**3.8.2.1.7 CLUI Interface**

Not applicable

**3.8.2.2 GUI name: SLOA**

Switched Line Services for MG9000

**3.8.2.2.1 Functional description**

This GUI will be used to define security parameters to be used in securing the call control link between the VMG and the gateway controller.

Added to the GW Controller Config tab will be a section for Security. This section will have three parameters:

1. Security OFF, ON or OfficeWide Default
2. IKE preshared key
3. IKE time to live

**3.8.2.2.2 GUI usage and implications**

GUIs must be used in the following sequence:

Optional: Office Wide defaults should be assigned first before provisioning VMGs.

**3.8.2.2.3 GUI fields**

The following table lists the security fields for SLOA GUI on the GW Controller Config tab.

**Table 2 GUI field descriptions**

| Field            | New or Changed | Subfield | Entry                        | Explanation and action                                                                                                                                                                        | Associated MIB entry |
|------------------|----------------|----------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Security         | New            | No       | OFF, ON, Officewide Defaults | Default = OFF<br><br>Indicates whether or not security is enabled. Option is to use the office wide defaults.<br><br>If OfficeWide Defaults are selected the remaining fields are grayed out. | TBD                  |
| IKE Preshare key | New            | No       | 26 digit HEX string?         | Preshared key used in the IKE establishment of a secure call control link.                                                                                                                    | TBD                  |

**Table 2 GUI field descriptions**

| Field            | New or Changed | Subfield | Entry                | Explanation and action                                         | Associated MIB entry |
|------------------|----------------|----------|----------------------|----------------------------------------------------------------|----------------------|
| IKE Time To Live | New            | No       | Non-negative integer | How long the currently established security session will last? | TBD                  |

**3.8.2.2.4 Usage example**

The following example shows sample datafill for the SLOA GUI:

*Screenshot of SLOA GUI with IPSec parameters shown to be provided later.*

**3.8.2.2.5 GUI release history update**

The following information was added:

Security section added to GW Controller Config tab.

**3.8.2.2.6 Supplementary information**

None

**3.8.2.2.7 CLUI Interface**

Not applicable

**3.8.2.3 GUI name: SSPFS Security**

SSPFS Security Interface

**3.8.2.3.1 Functional description**

This HTML webpage will be used to define security parameters to secure communications into and out from this SSPFS Machine. This includes MG9000 Element Manager to MG9000 OAM&P communications.

The craftsperson will be presented with a number of tables representing currently provisioned security parameters. Options to add and delete parameters are available. Adding parameters will be performed using HTML forms.

**3.8.2.3.2 GUI usage and implications**

Primary usage of this interface is to secure the OAM&P communications channel between the MG9000 and Element manager.

This interface provides for securing all communications and not just Element Manager communications. Care must be taken when provisioning or deleting the security parameters, so as not to effect other essential communications.

**3.8.2.3.3 GUI fields**

The following table lists the security fields for SSPFS Security Interface.

**Table 3 GUI field descriptions**

| Field | New or Changed | Subfield | Entry | Explanation and action | Associated MIB entry |
|-------|----------------|----------|-------|------------------------|----------------------|
| TBD   | TBD            | TBD      | TBD   | TBD                    | TBD                  |

**3.8.2.3.4 Usage example**

The following example shows sample datafill for the SSPFS Security Interface.:

*Screenshot of the SSPFS Security Interface with IPSec parameters shown to be provided later.*

**3.8.2.3.5 GUI release history update**

The following information was added:

Initial availability.

**3.8.2.3.6 Supplementary information**

None

**3.8.2.3.7 CLUI Interface**

Not applicable

**3.9 Command interface changes**

TBD

**3.10 Security****3.10.1 Network configuration**

No changes to the network are necessary to support the IPSec implementation.

**3.10.2 Key management****3.10.2.1 VMG IKE Preshared key**

VMG IKE preshared keys will be input by the user when provisioning a VMG. The key will be stored encrypted in the Oracle database. The will be sent the the MG9000 encrypted and stored in the MIB encrypted.

**3.10.2.2 SSPFS IKE Preshared key**

The SSPFS IKE preshared key be input by the user in the SSPFS Security Servlet. This key is secured by the use of secure http from the browser to the server. *Solaris stores all keys XXXXX.*

### 3.10.3 Protocol

IPSec is being used on the Solaris machine.

### 3.10.4 Authentication

Succession login will be used for SSPFS Security Servlet.

## 3.11 Configuration Walkthrough

### 3.11.1 OAM&P Security

From a high-level here are the steps to enable security on the OAM&P links.

1. Load both MG9000 and MG9000 Element Manager with required software.
2. When commissioning the MG9000, thru the LCI, the craftsperson will enable security on the management link to the Element Manager.
3. The craftsperson will then use a web browser and connect to the MG9000 Element Manager server machine. (Not the Mid-Tier machine) After logging in, the craftsperson will enable security on communications with the MG9000 IP address.
4. Cold start from MG9000 or manual discovery from Element Manager.
5. This will complete securing the OAM&P link.

### 3.11.2 VMG Security

From a high-level here are the steps to enable security on the call control links.

1. From SESM, enable security on the Gateway Controller.
2. From the SLOA GUI, provision a VMG. Enable security on the GW Controller Config tab.
3. This will complete securing the Call Control link.

***Product = MG 9000***

## **A00006894--InterNodal Emergency Stand Alone (ESA) for MG9K**

### ***Functional Description***

### **1.1 Applicable Solution(s)**

UA-IP

## 1.2 Description

InterNodal ESA provides the ability to make calls while in ESA between MG9K nodes. In doing so, the Telcos also provide the ability to provision a “Community of Interest” (COI), which defines which MG9K nodes can make ESA calls between one another. Calls cannot be made between the two communities, only within a given community. If an MG9K does not have access to a LAN Switch, it will operate in the pre-SN08 manner of routing calls between VMGs within a single MG9K node. Also, although a Community of Interest is defined, each node must be in ESA for it to participate in the community. Nodes are not forced to enter ESA.

### 1.2.1 Hardware Requirements or Dependencies

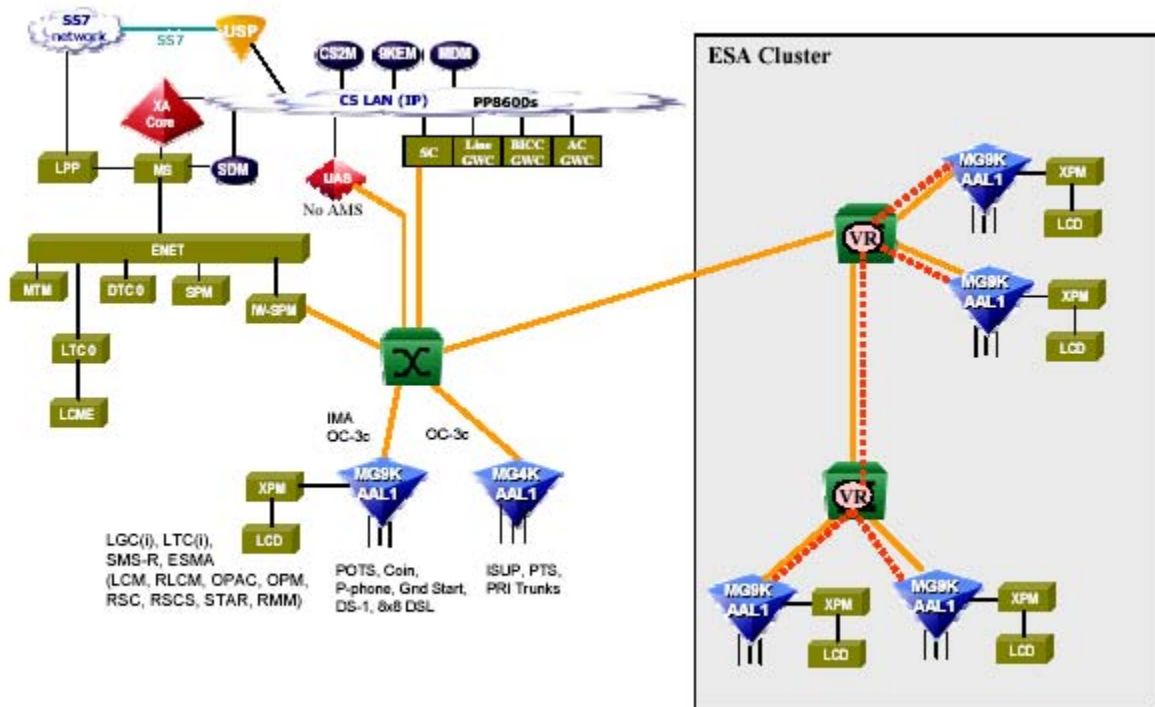
This feature applies to all supported hardware platforms, per the SN08 Succession server platform foundation software specification. No new hardware is required. A MG9K node in a community must have access to a LAN Switch (i.e. Passport 15000 or equivalent) in order for InterNodal ESA calls to complete.

### 1.2.2 Passport 15000 Configuration

The inter-MG9000 communication will be provided by the Passport 15000 switch, using the Virtual Router capability to route the IP-based ESA traffic between MG9K gateways.

To deploy this feature in the field, the existing Passport 15000 switches must be configured to support it. This configuration/provisioning consists of: provisioning the Passport 15000 software component and the required engineering to configure the Passports in the field.

A typical deployment scenario for this feature is a collapsed office (“a remote”), which typically consists of a single Passport 15000 switch connecting a group of MG9K gateways to a set of PNNI links back to the CS2000 site. If necessary, the collapsed office can use several Passport 15000 switches.



Each MG9K will now have a separate Vcc to connect to the Passport 15000 Virtual Router; RFC 1483 llc-snap IP encapsulation.

A list of possible deployment scenarios are:

- MG9000 connected to 4pOC3 FP card with ipRoutes > 0
- MG9000 connected to 16pOC3 FP card with ipRoutes > 0
  - Configured based on the tables defined in the Configuration section.
- MG9000 connected to 16pOC3 FP card with ipRoute = 0; either:
  - A hairpin is required that can do IP services. Setup on that hairpin, configuring a simple PVC on the MG9000 port to the hairpin, is described in the Configuration section.
- MG9000 STS-1 connected to 12pDS3 FP cards (which don't support IP)
- MG9000 IMA connected to 4pDS3 FP cards (which don't support IP)
  - For MG9000 on these cards, an IP hairpin is required.
  - PVC is needed between the MG9000 to the hairpin port.

Hairpins can be provisioned on:

- A new pair of 4pOC3 cards.
- Spare pair of 1+1 OC12 or OC3 ports on either 4pOC12 (PQC12) or 4pOC3 (assume ipRoutes > 0)



- Pair 16pOC3 with ipRoutes enabled - there are actually 26 free protected connection entries available when cards are loaded up with the “maximum” of 14 ports.
- Change lp eng arc apc ov to use those 26 connection entries on that APC (pre-SN09 use eggshell command or HCA in SN09 to do this in service)
- Connect port 14 to 15 on both cards
- Provision AtmIf, can theoretically support up to 26 MG9000 with this.

### 1.3 Software Requirements or Dependencies

This ESA activity on the MG9K is dependent upon two additional activities for successful completion:

- InterNodal Emergency Standalone (ESA) Element Manager (A00007415).
- Passport 15000 Support for MG9000 Inter-node ESA.

### 1.4 Limitations and restrictions

- No security will be implemented on the ESA SIP Callp Messaging for SN08.
- InterNodal ESA is designed to support a maximum of 15 MG9K nodes. Each node can support a maximum of 4 ABI pairs on the primary shelf and a maximum of 15 sub-tending shelves for a total of 20 VMGs per node. Each COI must be restricted to containing no more than 170 VMGs.
- A ESA Community of Interest (COI) must have access to a LAN Switch (i.e. Passport 15K or equivalent) in order for InterNodal ESA calls to complete.
- If an MG9K does not have access to a IP router (Passport VR), it will operate in the pre-SN08 manner of routing calls between VMGs within a single MG9K node.
- Although a Community of Interest is defined, each node must be in ESA for it to participate in the community. Nodes are not forced to enter ESA.
- A MG9K node can belong to only one Community of Interest at a time.
- All VMGs in a MG9K node must belong to the Community of Interest.
- All VMGs in a MG9K node can independently enter ESA.
- VMGs configured for ESA as either Basic (North American) or Enhanced will be supported within the same Community of Interest. However, VMGs configured as Basic will not be able to handle MADN, hunt group, or other feature specific behaviors included in the Enhanced feature suite.
- Emergency numbers should be provisioned per MG9K node. It is not recommended to rely on accessibility of remote nodes within the community.
- VMGs configured on non-North American Callservers only support ESA Basic (International). Therefore, InterNodal ESA on international switches will only support VMGs configured for ESA Basic within the Community of Interest.

- InterNodal ESA will be supported for the SLOA (ATM), SLOIP (IP), and SLOG (GigE) solutions in the SN08 time frame.
- InterNodal ESA will be supported for both the SLOA (ATM) and SLOIP (IP) solutions. SLOG will not be supported in the SN08 time frame.

## 1.5 Interactions

None. InterNodal ESA must not inhibit existing ESA functionality. InterNodal ESA must support the Enhanced ESA line services feature set across all nodes in the Community of Interest (COI).

## 1.6 Glossary

| Term  | Description                          |
|-------|--------------------------------------|
| ABI   | Access Bridge Interface              |
| COI   | Community of Interest                |
| ESA   | Emergency Stand Alone                |
| I-ESA | InterNodal ESA                       |
| LAN   | Local Area Network                   |
| MG9K  | Media Gateway 9000                   |
| PVC   | Permanent Virtual Circuit            |
| PVR   | Passport Virtual Router              |
| SLOA  | Switched Lines Over ATM              |
| SLOG  | Switched Lines Over Gigabit-Ethernet |
| SLOIP | Switched Lines Over IP               |
| SVC   | Switched Virtual Circuit             |
| VMG   | Virtual Media Gateway                |
| VR    | Virtual Router                       |

## 2: Configuration

### 2.1 Hardware and Software Requirements

This feature applies to all supported hardware platforms, per the SN08 Succession server platform foundation software specification. No new hardware is required. A MG9K node in a community must have access to a LAN Switch (i.e. Passport 15000 or equivalent) in order for InterNodal ESA calls to complete.

## 2.2 Initial Configuration

The inter-MG9000 communication will be provided by the Passport 15000 switch, using the Virtual Router capability to route the IP-based ESA traffic between MG9K gateways.

To deploy this feature in the field, the existing Passport 15000 switches must be configured to support it. This section covers the following:

- Details of the Passport 15000 software component provisioning.
- Engineering required to configure the Passports in the field.
- List of possible deployment scenarios.

## 2.3 Upgrade Considerations

For the InterNodal ESA feature using a Passport virtual router (PVR), it is expected that the Passport 15000 can be field upgraded to support inter-MG9000 communications.

For a MG9000 connected to Passport 16pOC3 FP cards without IP already enabled for in-band OAM, it can be a service impacting action to enable the PVR on the PP15K.

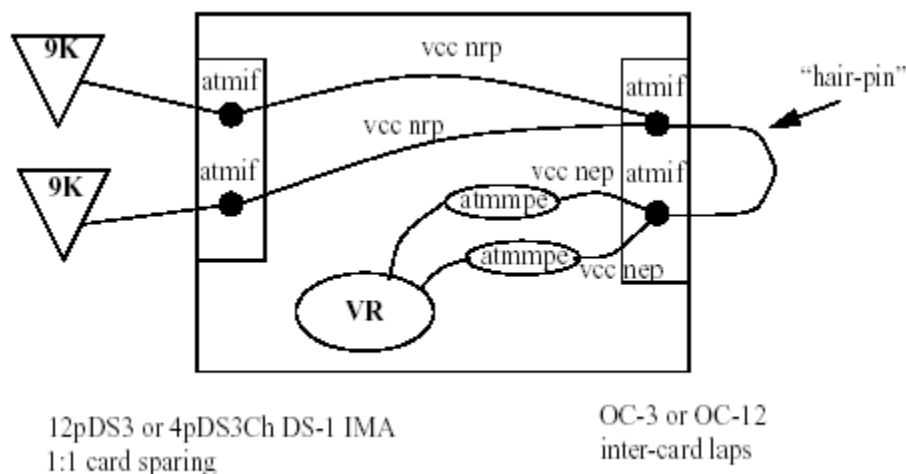
- Turning on IP reduces the card's ATM connection capacity such that only 14 ports can be supported. Fully populated cards would have to have some MG9000s migrated to other cards.
- atmif ca attributes on all ports on the FP need to be re-engineered from 3300 to 2100.
- Both of these changes (turning on IP and atmif ca) are "critical" changes - the former currently causes a dual-FP reboot.

Since an outage can not be allowed during an upgrade of existing field installations, the chosen solution is to put a hairpin on the shelf on a card that already supports IP, or can be IP enabled without service interruption (new hardware).

The MG9000 can have either a DS-1 IMA or an STS-1 interface which terminates on the Passport as a DS-3.

As IP is not supported on the 4pDS3ChIMA card, and carrier grade IP is not supported on the 12pDS3ATM FP card, these cards can only terminate the ATM layer, and an optical "hair-pin" must be used for IP forwarding.

**Figure 1 Electrical interface hair-pin IP connectivity**



This optical hair-pin can be deployed on a pair of cards deployed expressly for this purpose, or it can be deployed on spare ports of an optical pair with spare capacity. For instance, a pair of PQC12 4pOC12 FP cards with only two OC12 trunks will have enough spare ATM connection space and IP routing capacity to support over 100 MG9000 gateways for ESA traffic.

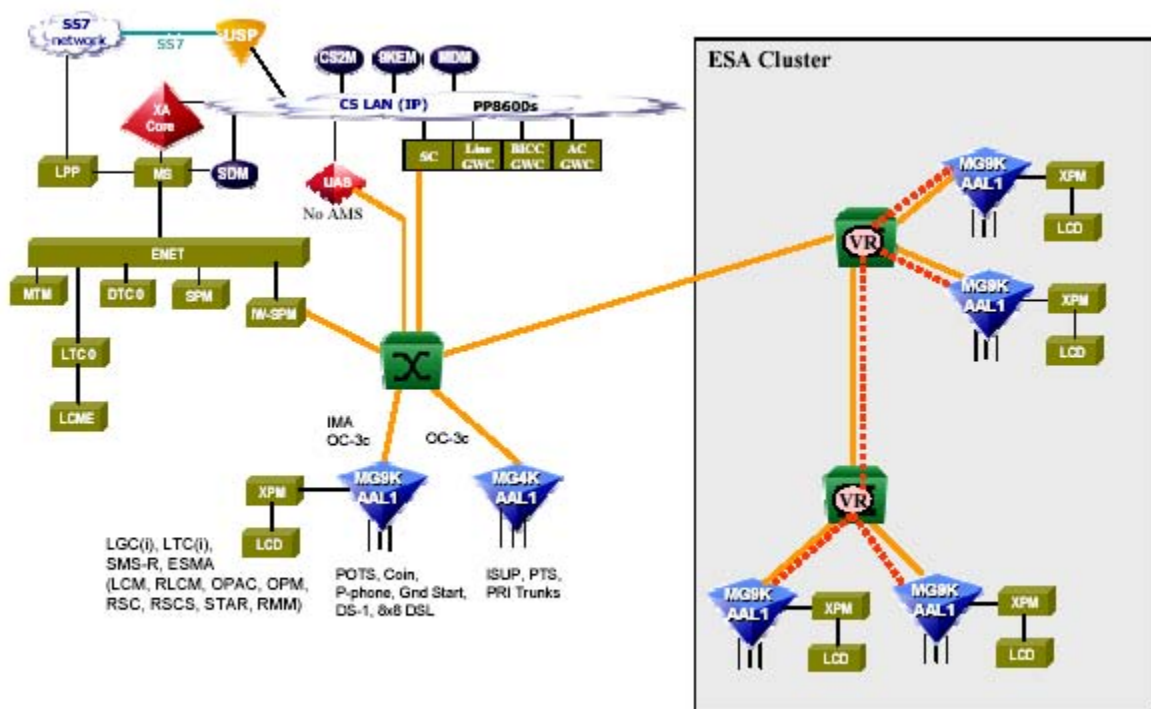
- A spare pair of ports on a card with available space can be used to deploy an IP hairpin that can do IP services.
- A new pair of cards (example: 4pOC3 FP) can be provisioned with an IP hairpin.

## 2.4 Security

No security will be implemented on the ESA SIP Callp Messaging for SN08.

## 2.5 Configuration Walkthrough

A typical deployment scenario for this feature is a collapsed office (“a remote”), which typically consists of a single Passport 15000 switch connecting a group of MG9K gateways to a set of PNNI links back to the CS2000 site. If necessary, the collapsed office can use several Passport 15000 switches.



Each MG9K will now have a separate Vcc to connect to the Passport 15000 Virtual Router; RFC 1483 llc-snap IP encapsulation.

For reference, this chapter contains all the components that are required for adding MG9000 InterNode ESA support to an already commissioned Passport 15000 in the Succession UA-AAL1 Solution. Not all components are required for all configurations. There is a table for each related group of components that must be created or changed. The “type” field means the following:

- **set:** the attribute is pre-engineered by Succession design and is the same for all switches at all sites for all customers.
- **default:** the attribute value is customer defined and/or must be engineered depending on the switch or network configuration.
- **link:** an attribute that is a link to another component.

## 2.5.1 CP and Shelf Commissioning

The following components are to be created or changed when a Passport 15000 shelf is first being commissioned for InterNode ESA.

### 2.5.1.1 Software and Features

The following software packages and lpt for the CP are required. They are not configured by an NP template but as part of the Passport 15000 base IM24-9095.

**Table 1 Software Component Provisionable Attributes**

| Attribute                  | Type    | Value                                                         |
|----------------------------|---------|---------------------------------------------------------------|
| <b>Software</b>            |         |                                                               |
| avList                     | default | ip_CF01XXX, wanDte_CF01XXX<br><i>add if not already there</i> |
| <b>Sw Lpt/CP</b>           |         |                                                               |
| featureList                | set     | ip, mvr<br><i>add if not already there</i>                    |
| <b>Sw Lpt/ATM&lt;n&gt;</b> |         |                                                               |
| featureList                | set     | ip, atmmpe<br><i>add if not already there</i>                 |

### 2.5.1.2 Virtual Router

**Table 2 Virtual Router component provisioning attributes**

| Attribute                                                                                             | Type | Value           |
|-------------------------------------------------------------------------------------------------------|------|-----------------|
| <b>VirtualRouter/ESA</b>                                                                              |      |                 |
| vpnMode                                                                                               | set  | customer        |
| vrp                                                                                                   | set  | lp/0            |
| <b>VirtualRouter/ESA Ip</b>                                                                           |      |                 |
| preConfigFwdPath                                                                                      | set  | enabled         |
| <b>VirtualRouter/ESA Ip Static<sup>a</sup></b>                                                        |      |                 |
| maxEcmpNextHops                                                                                       | set  | 1               |
| <b>VirtualRouter/ESA Ip Static Route/&lt;sub-net&gt;<sup>b</sup> nextHop/&lt;next-hop-address&gt;</b> |      |                 |
| metric                                                                                                | set  | 1               |
| <b>VirtualRouter/ESA Ip Static DiscardRouteEntry/0.0.0.0,0.0.0.0,0</b>                                |      |                 |
| discardRouteEntry                                                                                     | add  | 0.0.0.0,0.0.0.0 |

a. required to route traffic between Passport 15000 in the case where InterNode ESA groups span more than one Passport 15000.

b. <sub-net> is a triplet of the form <address>,<mask>,0

## 2.5.2 FP Cards

To carry the InterNodal ESA IP traffic, the FP cards that are directly connected to the MG9000 or supporting the hairpin connection for MG9000 connected to FP cards that cannot support IP traffic, the following FP level configuration changes must be made.

### 2.5.2.1 4pOC3SmlrATM

**Table 3 4pOC3SmlrAtm Component Provisionable Attributes**

| Attribute Name            | Type | Value |
|---------------------------|------|-------|
| <b>Lp Eng Ferc Pqc Ov</b> |      |       |
| ipRoutes                  | Set  | 4096  |

### 2.5.2.2 16pOC3SmlrAtm

**Table 4 16pOC3SmlrAtm Component Provisionable Attributes**

| Attribute Name                  | Type    | Value         |
|---------------------------------|---------|---------------|
| <b>Lp Eng Arc Ov</b>            |         |               |
| connectionPoolCapacity          | Default | <num>         |
| protectedConnectionPoolCapacity | Default | 29440 - <num> |
| <b>Lp Eng Ferc Pqc Ov</b>       |         |               |
| ipRoutes                        | Set     | 4096          |

### 2.5.2.3 4pOC12SmlrATM

**Table 5 4pOC12SmlrAtm (NTHW86 only) Component Provisionable Attributes**

| Attribute Name            | Type | Value |
|---------------------------|------|-------|
| <b>Lp Eng Ferc Pqc Ov</b> |      |       |
| ipRoutes                  | Set  | 4096  |

### 2.5.2.4 4pDS3ChAtm

No change to the FP configuration to add InterNodal ESA.

### 2.5.2.5 12pDS3Atm

No change to the FP configuration to add InterNodal ESA.

## 2.5.3 Interfaces

### 2.5.3.1 MG9000 OC-3 interface

The following component needs to be provisioned to support a InterNodal ESA IP MG9000 on a 1+1 OC-3 interfaces. Note that since MG9000 does not support ARP, there must be a static ARP entry provisioned into the Passport for each IP “host” on the MG9000.

**Table 6 MG9000 OC-3 interface component configuration**

| Attribute Name                                                              | Type    | Value                          |
|-----------------------------------------------------------------------------|---------|--------------------------------|
| <b>AtmIf Vcc/16.32 Nep</b>                                                  |         |                                |
| applicationName                                                             | Set     | AtmMpe/<n> Ac/1                |
| <b>AtmIf Vcc/16.32 vcd Tm</b>                                               |         |                                |
| atmServiceCategory                                                          | Set     | rtVbr                          |
| txPacketWiseDiscard                                                         | Set     | enabled                        |
| txTrafficDescriptorType                                                     | Set     | 6                              |
| txTrafficDescriptorParameters                                               | Default | 1 12000 2 6000 3 32            |
| <b>AtmMpe/&lt;n&gt;</b>                                                     |         |                                |
| linkToProtocolPort                                                          | Link    | Vr/ESA Pp/9K<n>_ESA            |
| <b>AtmMpe/&lt;n&gt; Ac/1</b>                                                |         |                                |
| atmConnection                                                               | Link    | AtmIf/<n> Vcc/<vpi.vci><br>nep |
| <b>Vr/ESA Pp/9K&lt;n&gt;_ESA</b>                                            |         |                                |
| linkToMedia                                                                 | Link    | AtmMpe/<n>                     |
| <b>Vr/ESA Pp/9K&lt;n&gt;_ESA ipport LogicalInterface/&lt;ESA_IPaddr&gt;</b> |         |                                |
| netMask                                                                     | Set     | 255.255.255.224                |
| <b>Vr/ESA Ip Arp Host/&lt;ESA_IPaddr+m&gt;,0<sup>a</sup></b>                |         |                                |
| pvc                                                                         | Set     | 1                              |

a. ARP entries must be provisioned for the 16 MG9000 ITP IP addresses



### 2.5.3.2 MG9000 DS-1 IMA interface

The following component needs to be provisioned to support MG9000 InterNodal ESA on a DS-1 IMA interface. This consists of a Vcc Network Relay Point (NRP) to a Hairpin ATM Interface.

**Table 7 MG9000 DS-1 IMA interface Component Provisionable Attributes**

| Attribute Name                    | Type    | Value                         |
|-----------------------------------|---------|-------------------------------|
| <b>AtmIf Vcc/16.32 Nrp</b>        |         |                               |
| nextHop                           | Default | AtmIf/<HAI> Vcc/<vpi.vci> Nrp |
| <b>AtmIf Vcc/16.32 Nrp Vcd Tm</b> |         |                               |
| atmServiceCategory                | Set     | rtVbr                         |
| txPacketWiseDiscard               | Set     | enabled                       |
| txTrafficDescriptorType           | Set     | 6                             |
| txTrafficDescriptorParameters     | Default | 1 950 2 380 3 32              |

### 2.5.3.3 MG9000 STS-1/DS3 interface

The following component needs to be provisioned to support MG9000 InterNodal ESA on a DS-3 interface This consists of a Vcc Network Relay Point (NRP) to a Hairpin ATM Interface.

**Table 8 MG9000 STS-1/DS-3 interface Component Provisionable Attributes**

| Attribute Name                    | Type    | Value                         |
|-----------------------------------|---------|-------------------------------|
| <b>AtmIf Vcc/16/32 Nrp</b>        |         |                               |
| nextHop                           | Default | AtmIf/<HAI> Vcc/<vpi.vci> Nrp |
| <b>AtmIf Vcc/16.32 Nrp Vcd Tm</b> |         |                               |
| atmServiceCategory                | Set     | rtVbr                         |
| txPacketWiseDiscard               | Set     | enabled                       |
| txTrafficDescriptorType           | Set     | 6                             |
| txTrafficDescriptorParameters     | Default | 1 ?? 2 ?? 3 32                |

### 2.5.3.4 Hairpin ATM interface

Table 11, “Optical HII interface component configuration.” documents all the components and attributes to be provisioned for the optical Hairpin ATM Interface (HAI) from scratch. Table 12, “MG9000 Vcc and Vr HII component configuration.” covers the Vcc Nrp components required to support one

MG9000. As a single hairpin interface can support many MG9000s, those components will typically be applied several times.

**Table 9 Optical HAI interface component configuration**

| Attribute Name                         | Type    | Value                                                |
|----------------------------------------|---------|------------------------------------------------------|
| <b>Lp Sonet</b>                        |         |                                                      |
| clockingSource                         | Set     | module                                               |
| vendor                                 | Default |                                                      |
| commentText                            | Default |                                                      |
| <b>Laps</b>                            |         |                                                      |
| workingLine                            | Link    | Lp/n Sonet/m                                         |
| protectionLine                         | Link    | Lp/n+1 Sonet/m                                       |
| signalDegradeRatio                     | Default | -8                                                   |
| <b>Laps Sts (OC-12 only)</b>           |         |                                                      |
| concatNumber                           | Set     | 12                                                   |
| <b>Laps Sts AtmCell</b>                |         |                                                      |
| correctSingleBitHeaderErrors           | Set     | On                                                   |
| <b>AtmIf</b>                           |         |                                                      |
| interfaceName                          | Link    | Laps/<n*100+m> Sts/0                                 |
| remoteAtmInterfaceLabel                | Default | EM/<remoteNodeName><br>ATMIF/<remote AtmIf instance> |
| oamSegmentBoundary                     | Set     | No                                                   |
| <b>AtmIf ConnMap Ov (4pOC-12 only)</b> |         |                                                      |
| numVccsForVpiZero                      | Set     | 16384                                                |
| <b>AtmIf Ca<sup>a</sup></b>            |         |                                                      |
| maxVccs                                | Set     | 3250/13000                                           |
| maxAutoSelectedVciForVpiZero           | Set     | 4095/16383                                           |
| minAutoSelectedVciForVpiZero           | Set     | 2048                                                 |
| maxVpcs                                | Set     | 0                                                    |
| maxVpts                                | Set     | 0                                                    |
| bandwidthPool                          | Set     | 1 100 2 0 3 0                                        |

| Attribute Name         | Type | Value    |
|------------------------|------|----------|
| <b>AtmIf Ca rtVbr</b>  |      |          |
| cdvt                   | Set  | 5000     |
| usageParameterControl  | Set  | Disabled |
| <b>AtmIf Ca nrtVbr</b> |      |          |
| cdvt                   | Set  | 5000     |
| usageParameterControl  | Set  | Disabled |

a. values are given for both OC-3 / OC-12

**Table 10 MG9000 Vcc Nrp HAI component configuration.**

| Attribute Name                            | Type    | Value                    |
|-------------------------------------------|---------|--------------------------|
| <b>AtmIf Vcc/0.&lt;vci&gt; Nrp</b>        |         |                          |
| nextHop                                   | Default | AtmIf/<MG> Vcc/16.32 Nrp |
| <b>AtmIf Vcc/0.&lt;vci&gt; Nrp Vcd Tm</b> |         |                          |
| atmServiceCategory                        | Set     | rtVbr                    |
| txPacketWiseDiscard                       | Set     | enabled                  |
| txTrafficDescriptorType                   | Set     | 6                        |
| txTrafficDescriptorParameters             | Default | <sup>a</sup>             |

a. values depend on whether the MG9000 is IMA or DS3

### 2.5.3.5 Hairpin IP interface

Table 11, “Optical HII interface component configuration.” documents all the components and attributes to be provisioned for the optical Hairpin IP Interface (HII) from scratch. Table 12, “MG9000 Vcc and Vr HII component configuration.” covers the Vcc, AtmMpe and Vr components required to support one MG9000. As a single hairpin can support many MG9000,s those components will typically be applied several times.

**Table 11 Optical HII interface component configuration**

| Attribute Name  | Type    | Value  |
|-----------------|---------|--------|
| <b>Lp Sonet</b> |         |        |
| clockingSource  | Set     | module |
| vendor          | Default |        |

| Attribute Name                         | Type    | Value                                                   |
|----------------------------------------|---------|---------------------------------------------------------|
| commentText                            | Default |                                                         |
| <b>Laps</b>                            |         |                                                         |
| workingLine                            | Link    | Lp/n Sonet/m                                            |
| protectionLine                         | Link    | Lp/n+1 Sonet/m                                          |
| signalDegradeRatio                     | Default | -8                                                      |
| <b>Laps Sts (OC-12 only)</b>           |         |                                                         |
| concatNumber                           | Set     | 12                                                      |
| <b>Laps Sts AtmCell</b>                |         |                                                         |
| correctSingleBitHeaderErrors           | Set     | On                                                      |
| <b>AtmIf</b>                           |         |                                                         |
| interfaceName                          | Link    | Laps/<n*100+m> Sts/0                                    |
| remoteAtmInterfaceLabel                | Default | EM/<remoteNodeName><br>ATMIF/<remote AtmIf<br>instance> |
| oamSegmentBoundary                     | Set     | No                                                      |
| <b>AtmIf ConnMap Ov (4pOC-12 only)</b> |         |                                                         |
| numVccsForVpiZero                      | Set     | 16384                                                   |
| <b>AtmIf Ca<sup>a</sup></b>            |         |                                                         |
| maxVccs                                | Set     | 3250/13000                                              |
| maxAutoSelectedVciForVpiZero           | Set     | 4095/16383                                              |
| minAutoSelectedVciForVpiZero           | Set     | 2048                                                    |
| maxVpcs                                | Set     | 0                                                       |
| maxVpts                                | Set     | 0                                                       |
| bandwidthPool                          | Set     | 1 100 2 0 3 0                                           |
| <b>AtmIf Ca rtVbr</b>                  |         |                                                         |
| cdvt                                   | Set     | 5000                                                    |
| usageParameterControl                  | Set     | Disabled                                                |
| <b>AtmIf Ca nrtVbr</b>                 |         |                                                         |
| cdvt                                   | Set     | 5000                                                    |
| usageParameterControl                  | Set     | Disabled                                                |

a. values are given for both OC-3 / OC-12

**Table 12 MG9000 Vcc and Vr Hll component configuration**

| Attribute Name                                                              | Type    | Value                       |
|-----------------------------------------------------------------------------|---------|-----------------------------|
| <b>AtmIf Vcc/0.&lt;vci&gt; Nep</b>                                          |         |                             |
| applicationName                                                             | Set     | AtmMpe/<n> Ac/1             |
| <b>AtmIf Vcc/0.&lt;vci&gt; vcd Tm</b>                                       |         |                             |
| atmServiceCategory                                                          | Set     | rtVbr                       |
| txPacketWiseDiscard                                                         | Set     | enabled                     |
| txTrafficDescriptorType                                                     | Set     | 6                           |
| txTrafficDescriptorParameters                                               | Default | <sup>a</sup>                |
| <b>AtmMpe/&lt;n&gt;</b>                                                     |         |                             |
| linkToProtocolPort                                                          | Link    | Vr/ESA Pp/9K<n>_ESA         |
| <b>AtmMpe/&lt;n&gt; Ac/1</b>                                                |         |                             |
| atmConnection                                                               | Link    | AtmIf/<n> Vcc/<vpi.vci> nep |
| <b>Vr/ESA Pp/9K&lt;n&gt;_ESA</b>                                            |         |                             |
| linkToMedia                                                                 | Link    | AtmMpe/<n>                  |
| <b>Vr/ESA Pp/9K&lt;n&gt;_ESA ipport LogicalInterface/&lt;ESA_IPaddr&gt;</b> |         |                             |
| netMask                                                                     | Set     | 255.255.255.224             |
| <b>Vr/ESA Ip Arp Host/&lt;ESA_IPaddr+m&gt;,0<sup>b</sup></b>                |         |                             |
| <b>AtmMpe/&lt;n&gt;</b>                                                     |         |                             |

a. values depend on whether the MG9000 is IMA or DS3

b. ARP entries must be provisioned for the 16 MG9000 ITP IP addresses

### 2.5.3.6 Passport to Passport interface

If an InterNodal ESA group spans more than one Passport 15000, then there needs to be at least one IP path among all the Passports over PNNI links.

**Table 13 Passport to Passport interface component configuration**

| Attribute Name            | Type | Value |
|---------------------------|------|-------|
| <b>AtmIf Vcc/0.33 Nep</b> |      |       |

| Attribute Name                                                             | Type    | Value                     |
|----------------------------------------------------------------------------|---------|---------------------------|
| applicationName                                                            | Set     | AtmMpe/<n> Ac/1           |
| <b>AtmIf Vcc/0.33 vcd Tm</b>                                               |         |                           |
| atmServiceCategory                                                         | Set     | rtVbr                     |
| txTrafficDescriptorType                                                    | Set     | 6                         |
| txPacketWiseDiscard                                                        | Set     | enabled                   |
| txTrafficDescriptorParameters                                              | Default | 1 12000 2 6000 3 32       |
| <b>AtmMpe/&lt;n&gt;</b>                                                    |         |                           |
| linkToProtocolPort                                                         | Link    | Vr/ESA Pp/<EM><AtmIf>_ESA |
| <b>AtmMpe/&lt;n&gt; Ac/1</b>                                               |         |                           |
| atmConnection                                                              | Link    | AtmIf/<n> Vcc/0.33 nep    |
| <b>Vr/ESA Pp/PP&lt;n&gt;_ESA</b>                                           |         |                           |
| linkToMedia                                                                | Link    | AtmMpe/<n>                |
| <b>Vr/ESA Pp/PP&lt;n&gt;_ESA ipport LogicalInterface/&lt;PP_IPaddr&gt;</b> |         |                           |
| netMask                                                                    | Default | 255.255.255.252           |

***Product = MG 9000***

## **A00006906--SN08 Clock Sync Enhancements**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

This Feature covers the software development on the Succession MG9000 (MG9K) node and specifically on the DCC and ITP cards. The clock sync code on the DCC is used to recover a synchronization signal from a Building Integrated Timing Source (aka. BITS, BITS is North American usage) or a Synchronization Supply Unit (aka SSU, International usage) signal. This signal is forwarded to the MG9K ITP card which uses the signal to synchronize the MG9K node.

Prior to SN08, the MG9K only supports the North American standard timing reference (BITS). This system uses DS-1 interfaces which are incompatible with the international standard 2048kHz interface. Lack of 2048kHz interfaces complicates the introduction of MG9K into international markets.

This feature introduces the capability for the NY45FA GiGE DCC circuit pack to connect to an International standard Synchronization Supply Unit (SSU) using 2048kHz interfaces. The NY45FA can use an SSU or BITS signal as a timing reference.

### 1.3 Hardware Requirements or Dependencies

The new content provided by this feature is only activated if the MG9K NY45FA GiGE card is present in the node. The content of this feature will actually exist in the other DCC loads but will not be activated. Software will determine what behavior (BITS or SSU) to activate based on the PEC code of the DCC hardware along with provisioning information.

### 1.4 Software Requirements or Dependencies

There are no software feature dependencies required by this feature. This feature is stand alone.

### 1.5 Limitations and restrictions

Include only those limitations and restrictions that are visible to any user. Describe the incompatibilities, limitations and restrictions imposed by this feature that may affect the end user.

- This feature will only be activated if the MG9K has a NY45FA GiGE DCC card(s) in the node.
- This feature only supports 2048kHz signal formats that conform to G703 section 13 and 120 ohm (twisted pair) interfaces. This signal is a 2048 kHz signal, i.e. it does not conform to G.704 frame format. Therefore the following is NOT supported
  - 75 ohm load impedance is NOT supported.
  - 2048 kbit/s interface is NOT supported. (G.704 frame format)
- This feature is not backward compatible, i.e. downgrading the DCC to a load previous to SN08 will result in a loss of SSU synchronization since that functionality is not provided by previous software releases.
- GiGE DCC cards will not have the ability to obtain a timing reference from the network interface. Provisioning for network timing will be blocked.

### 1.6 Interactions

In SN08, the MG9K Element Manager (EM) is planning to implement a GUI for the GiGE circuit pack. As part of that GUI is included a Clock sync

interface. The intent of the GUI is to represent all of the information that is currently displayed on the clock sync LCI pages plus the inclusion of the new SSU information. The infrastructure for the data is already in place so the interaction with the Element Manager takes place using standard SNMP Gets and Puts. No functionality changes to the Clock Sync code are expected as a result of this related but independent feature.

## 1.7 Applicable customer facing sections

|                                    |                   |
|------------------------------------|-------------------|
| Functional Description (Mandatory) | <u>  X  </u>      |
| Fault Management                   |                   |
| Not applicable                     | <u>          </u> |
| Logs                               | <u>  X  </u>      |
| Alarms                             | <u>  X  </u>      |
| Configuration                      |                   |
| Not applicable                     | <u>          </u> |
| Data Schema/MIBs                   | <u>  X  </u>      |
| User Interface                     | <u>  X  </u>      |
| GUI                                | <u>  X  </u>      |
| Element Management                 | <u>          </u> |
| Security                           | <u>          </u> |
| Service Order                      | <u>          </u> |
| Office Parameters                  | <u>          </u> |
| SOC                                | <u>          </u> |
| Upgrades impact                    | <u>          </u> |
| Accounting (includes AMA billing)  | <u>          </u> |
| Not Applicable                     | <u>  X  </u>      |
| Billing changes                    | <u>          </u> |
| Performance                        | <u>          </u> |



Not Applicable \_\_\_\_\_X\_\_\_\_\_

Operational Measurements \_\_\_\_\_

Performance Measurement \_\_\_\_\_

## 1.8 Glossary

| Term | Description                                        |
|------|----------------------------------------------------|
| LCI  | Local Craft Interface – A web based user interface |
| SSU  | Synchronization Supply Unit                        |

## 1.9 Alarms

Two new alarms are created that indicate a DAC voltage error:

- "DACV at Rail", Major alarm. This alarm means that the ITP clock circuitry has attempted to acquire sync and has traversed the frequency range to the extreme end of its capture range. When this occurs it typically indicates that the incoming clock reference is not synchronized to a good reference and is out of the MG9K's acceptable frequency range. The corrective action would be to investigate and solve the incoming clock reference frequency.  
If this alarm occurs on the active ITP, and the inactive ITP is not in the same state, then a SWACT will occur.
- "DACV Out of Range", Major alarm. This alarm means that the ITP 's DACV clock circuitry is in an invalid condition and the values are out of range. When this occurs it typically indicates that the ITP DACV circuitry is not functional. In most cases this means the ITP card should be replaced. If a "Lock, Restart Flash Primary" action does not clear this fault then definitely this indicates a faulty ITP card.  
If this alarm occurs on the active ITP and the inactive ITP is not in the same state then a SWACT will occur.

***Product = MG 9000***

## **A00007000--GIGE Network Interface EM Portion**

### ***Functional Description***

#### **1.1 Feature name**

GIGE Network Interface EM Portion

## 1.2 Applicable Solution(s)

UA-IP

## 1.3 Description

This document describes the functional description of the new Gigabit Ethernet interface for MG9000. Existing VOIP MG9000 is an ATM based IP network Interface. The GigE interface will provide IP connectivity to the MG9000. A new SuperCore Gigabit Ethernet card (known as SCG) that has four ports (one WAN port, other three subtending ports) is being introduced to support GigE configuration. In SN08, subtending ports are not supported.

### 1.3.1 Display

The user can view the following GigE related parameters:

- 1 Card data (physical attributes, activity status and software load)
- 2 Link data (physical attributes, link attributes)
- 3 Link protection status
- 4 Performance parameters through the Performance Browser:
  - PM/ OM per link
  - RMON per link
  - SMON per VLAN
- 5 GigE card and link alarms through the Alarm Browser.
- 6 Network interface bandwidth data through the Bandwidth Manager:
  - Current ITP voice usage (in bits/second)
  - Current ABI voice usage (in bits/second)
  - Overall network interface utilization (in bits/second)

NOTE: In SN08, only Switched Lines and ABI services are supported.

- 7 Clock synchronization status:
  - Clock status (active/inactive)
  - Chosen reference
  - DAC voltage

### 1.3.2 Provisioning

The user can view and provision the following attributes:

- 1 Card state (administrative and configuration state)
- 2 Link state (administrative and configuration state)

NOTE: the user cannot lock the active WAN port from EM.

- 3** Facility loopback (enable/disable)
- 4** Frequency and loss rate for Link Integrity Monitoring
- 5** Tx RFI and Rx RFI:

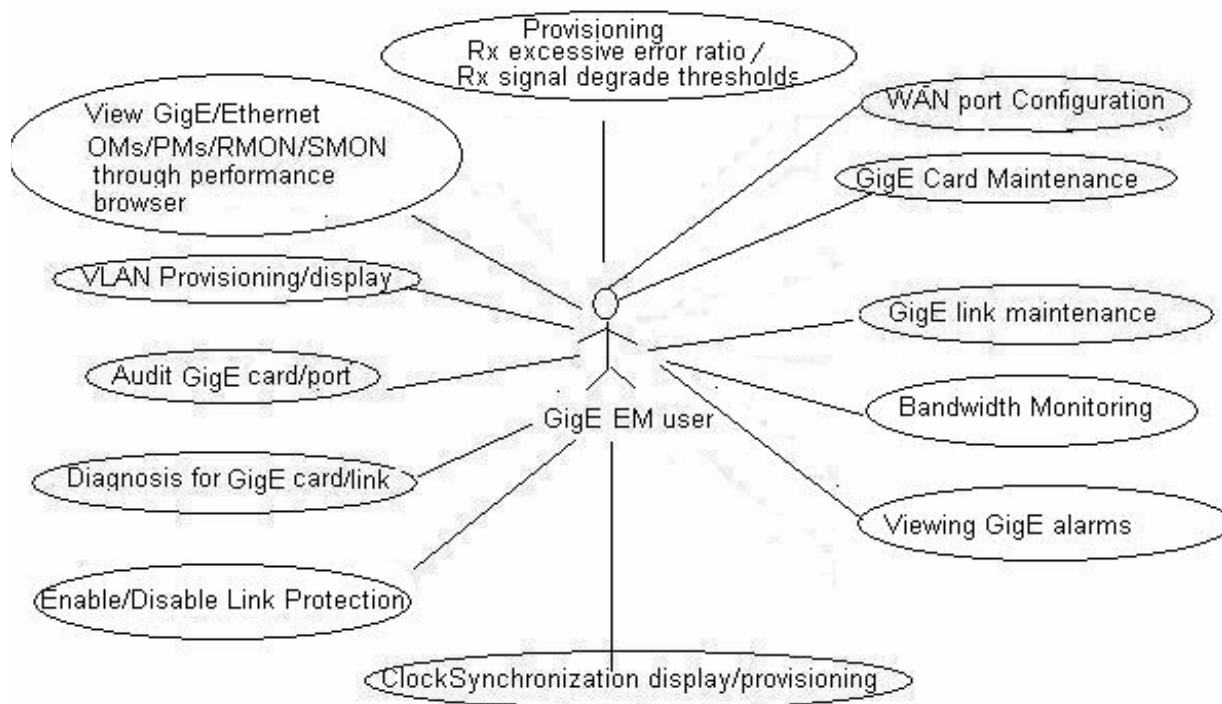
Tx RFI and Rx RFI will be ON by default. On disabling, a warning message will be displayed to the user.
- 6** SES to generate UAS
- 7** Soak time for UAS count
- 8** The SSU format is supported by GigE, but the user cannot provision it from the EM.
- 9** For Link reversion, preferred and non-preferred links need not be specified. The user needs to specify the Protection group number and the wait time.
- 10** Clock synchronization:

The user can provision the Primary and Alternate clock references and their encoding formats. The available references are DCC BITS, ITX BITS and NETWORK (supported by SCO and SCI cards). GigE does not support the NETWORK reference. Besides supporting SF and ESF encoding formats (as supported by the SCO and SCI cards), GigE also supports SSU format.
- 11** Link Reversion:

The user needs to specify the preferred and non-preferred link along with the wait to revert time for link reversion.
- 12** VLAN data:

The user can view and modify the peak rate and priority for the following VLANs: OAM&P, Bearer, Call Control, 1 for the fixed IP addresses of the active and inactive cards.
- 13** Inactive WAN configuration:

The WAN port can be changed for only the inactive SCG card from EM.

**Figure 2 Use Case Diagram**

## 1.4 Hardware Requirements or Dependencies

A new SuperCore card to support the GigE configuration is required.

## 1.5 Software Requirements or Dependencies

The MG9K GIGE load is required to test EM code changes.

## 1.6 Limitations and restrictions

None

## 1.7 Interactions

None

## Glossary

| Term | Description                |
|------|----------------------------|
| ATM  | Asynchronous Transfer Mode |

| Term | Description                       |
|------|-----------------------------------|
| RMON | Remote Network Monitoring         |
| UAS  | Unavailable Second                |
| SSU  | Synchronization Supply Units      |
| SMON | Switched Network Monitoring       |
| SES  | Severely Errored Second           |
| RFI  | Remote Failure Indication         |
| BITS | Building Integrated Timing Supply |
| OM   | Operational Measurement           |
| WAN  | Wide Area Network                 |
| ABI  | Access Bridge Interface           |
| DSL  | Digital Subscriber Line           |
| GigE | Gigabit Ethernet                  |
| PM   | Performance Monitoring            |
| VLAN | Virtual Local Area Network        |
| DCC  | Data Control Card                 |
| ITX  | Internet Telephony Extender       |
| ITP  | Internet Telephony Processor      |
| SCO  | SuperCore OC3                     |
| SCI  | SuperCore DS1 IMA                 |
| SF   | DS1 Super Frame                   |
| ESF  | Extended Super Frame              |
| SSU  | Synchronization Supply Unit       |
| DAC  | Digital to Analogue Converter     |

## ***Fault Management for A00007000***

### **2.1 Fault management strategy**

The standard MG9K EM Fault management strategy will apply to the new faults raised by this feature. Alarms will be displayed by the MG9K EM alarms browser, logged in NT standard format to the SSPFS cust logs and forwarded to the northbound OSS and IEMS.

“A00007000 - GIGE network Interface” feature introduces new faults.

## 2.2 Fault management tools and utilities

The Alarm Browser reports alarms from registered events. When an alarm is generated, it is displayed in the Alarm Browser along with the date and time, the NE Id, the resource (where the alarm was generated), the severity and probable cause. Highlighting the alarm displays the description of the alarm in the text box at the bottom of the Alarm Browser.

The Log Adaptor generates logs from registered events. The log names and numbers are predetermined and are matched with the incoming event. A log with the corresponding name and number which contains the date, time, physical location, severity and any other pertinent information is generated and placed into a separate file.

## 2.3 Logs

### 2.3.1 Formats

The Log Delivery application for this feature generates logs in the Number 2 Switch Control Center (SCC2) format and the NT standard (STD) format.

The log type for GIGE alarms will be ‘GIGE’ and the log ids will start from 301.

#### 2.3.1.1 NTSTD

- **LossOfSignal**

GIGE 301 \*\*\* AUG 31 06:14:43 3409 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 204  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault - Description: Loss of Signal  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **RemoteFailureIndication**

GIGE 302 \*\*\* AUG 31 06:14:43 3410 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 205  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970

Component Id: Port.frame0.shelf3.slot10.Gige.Link01

Specific Problem:norGigeLinkFault - Description: Remote Failure

Indication

Site Flr RPos Bay\_id

FFFF FF FFFF MG9F FFF

- **TxF**

GIGE 303 \*\*\* AUG 31 06:14:43 3411 TBL MG9K NorGigeLinkFault

Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01

Notification Id: 206

State: not acknowledged

Category: Communication Alarm

Cause: Communications Subsystem Failure

Time: Jan 01 05:39:05 1970

Component Id: Port.frame0.shelf3.slot10.Gige.Link01

Specific Problem:norGigeLinkFault -

Description: Transmit Failure on GIGE Link

Site Flr RPos Bay\_id

FFFF FF FFFF MG9F FFF

- **TEM**

GIGE 304 \* AUG 31 06:14:43 3412 TBL MG9K NorGigeLinkFault

Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01

Notification Id: 270

State: not acknowledged

Category: Communication Alarm

Cause: Communications Subsystem Failure

Time: Jan 01 05:39:05 1970

Component Id: Port.frame0.shelf3.slot10.Gige.Link01

Specific Problem:norGigeLinkFault -

Description: Temperature threshol exceeded

Site Flr RPos Bay\_id

FFFF FF FFFF MG9F FFF

- **POW**

GIGE 305 \* AUG 31 06:14:43 3413 TBL MG9K NorGigeLinkFault

Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01

Notification Id: 271

State: not acknowledged

Category: Communication Alarm

Cause: Communications Subsystem Failure

Time: Jan 01 05:39:05 1970

Component Id: Port.frame0.shelf3.slot10.Gige.Link01

Specific Problem:norGigeLinkFault -

Description: Low Power Indicated

Site Flr RPos Bay\_id

FFFF FF FFFF MG9F FFF

- **TxSD**

GIGE 306 \* AUG 31 06:14:43 3413 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 283  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Transmit Signal Degraded  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **TxEER**

GIGE 307 \* AUG 31 06:14:43 3413 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 284  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Transmit Excessive Error Ratio.  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **TBC**

GIGE 308 \* AUG 31 06:14:43 3414 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 272  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault  
Description: Transmit Bias Current  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **LINT**

GIGE 309 \*\* AUG 31 06:14:43 3415 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 273  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure



Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault-Description:LinkInitialization  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **OPT**

GIGE 310 \*\*\* AUG 31 06:14:43 3416 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 274  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Transmit Optical Power  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **OPR**

GIGE 311 \* AUG 31 06:14:43 3417 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 275  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Receive Optical Power  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **GARP**

GIGE 312 \*\* AUG 31 06:14:43 3418 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 276  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault - Description: GARP failure  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **LKINT**

GIGE 313 \*\* AUG 31 06:14:43 3420 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 278  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Link Initialization Failure  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **AUTONEG**

GIGE 314 \*\* AUG 31 06:14:43 3421 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 279  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Auto negotiation Failure  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **NONPREFLINK**

GIGE 315 \*\* AUG 31 06:14:43 3422 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 280  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: Non Preferred Link is active  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **LINK INVALID STATUS**

GIGE 315 \*\* AUG 31 06:14:43 3422 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 280  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure

Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeLinkFault -  
Description: The link status is invalid  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **Network Fault**

GIGE 315 \*\* AUG 31 06:14:43 3422 TBL MG9K NorGigeLinkFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 280  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:39:05 1970  
Component Id: Port.frame0.shelf3.slot10.Gige.Link01  
Specific Problem:norGigeNetworkFault -  
Description: Network Fault  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

### 2.3.1.2 SCC2

- **Loss of Signal**

\*\*\* GIGE 301 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault Description: Loss Of Signal  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **Remote Failure Indication**

\*\*\* GIGE 302 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 301  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Remote Failure Indication  
Site Flr RPos Bay\_id

FFFF FF FFFF MG9F FFF

- **TXF**

\*\*\* GIGE 303 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 208  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Transmit Failure on GIGE Link  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **TEM**

\*\*\* GIGE 304 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 209  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Temperature threshold exceeded  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **POW**

\*\*\* GIGE 305 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 210  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Low Power indicated  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **RxSD**

\*\*\* GIGE 306 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 210  
State: not acknowledged

Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Receive Signal Degraded  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **RxEED**

\*\*\* GIGE 307 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Link01  
Notification Id: 210  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Receive Excessive error ratio  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **TBC**

\*\*\* GIGE 308 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault Description: Transmit Bias

Current

Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **LINT**

\*\*\* GIGE 309 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault Description: Link Initialization  
Site Flr RPos Bay\_id

FFFF FF FFFF MG9F FFF

- **OPT**

\*\*\* GIGE 310 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Transmit Optcal Power  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **OPR**

\*\*\* GIGE 311 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Receive Optical Power  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **GARP**

\*\*\* GIGE 312 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: GARP Failure  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **LKINT**

\*\*\* GIGE 313 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged

Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Link Integrity Failure  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **AUTONEG**

\*\*\* GIGE 314 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Auto negotiation Failure  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **NONPREFLINK**

\*\*\* GIGE 315 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: Non Preferred link is active  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **LINK INVALID STATUS**

\*\*\* GIGE 315 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeLinkFault  
Description: The Link Status is invalid

Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

- **NETWORK FAULT**

\*\*\* GIGE 315 5915 TBL MG9K NorGigeLineFault  
Location: 406-c406-FrameFFF.Shelf3.Slot10.Port00.Link01  
Notification Id: 300  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jan 01 05:54:38 1970  
Component Id: Port.frame0.shelf3.slot10.OC3.Link01  
Specific Problem: NorGigeNetworkFault  
Description: Network Fault  
Site Flr RPos Bay\_id  
FFFF FF FFFF MG9F FFF

## 2.4 Alarms

The new alarms introduced in this feature are:

### 1 LOS

- Alarm Format: - 301 LOS
- Associated alarm message - Loss of Signal
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an LOS with faultdefinition - clear is received.

### 2 RFI

- Alarm Format: - 302 RFI
- Associated alarm message - Remote Failure Indication
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an RFI with faultdefinition - clear is received.

### 3 TxF

- Alarm Format: - 303 TxF
- Associated alarm message - Transmit Failure
- Severity: Critical



- Cause: Network Problem
- Action: This alarm will be cleared when an TxF with faultdefinition - clear is received.

#### **4 TEM**

- Alarm Format: - 304 TEM
- Associated alarm message - Temperature Threshold Exceeded
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when a TEM with faultdefinition - clear is received.

#### **5 POW**

- Alarm Format: - 305 POW
- Associated alarm message - Low power indicated
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an POW with faultdefinition - clear is received.

#### **6 RxSD**

- Alarm Format: - 306 RxSD
- Associated alarm message - Receive Signal Degraded
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an POW with faultdefinition - clear is received.

#### **7 RxEED**

- Alarm Format: - 307 RxEED
- Associated alarm message - Receive Excessive Error Ratio
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an RxEED with faultdefinition - clear is received.

**8 TBC**

- Alarm Format: - 308 TBC
- Associated alarm message - Transmit Bias Current
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an TBC with faultdefinition - clear is received.

**9 LINT**

- Alarm Format: - 309 LINT
- Associated alarm message - Link initialization
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an LINT with faultdefinition - clear is received.

**10 OPT**

- Alarm Format: - 310 OPT
- Associated alarm message - Transmit Optical Power
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an OPT with faultdefinition - clear is received.

**11 OPR**

- Alarm Format: - 311 OPR
- Associated alarm message - Receive Optical Power
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an OPR with faultdefinition - clear is received.

**12 GARP**

- Alarm Format: - 312 GARP

- Associated alarm message - GARP Failure
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an GARP with faultdefinition - clear is received.

### **13 LKINT**

- Alarm Format - 313 LKINT
- Associated alarm message - Link Integrity Failure
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an LKINT with faultdefinition - clear is received.

### **14 AUTONEG**

- Alarm Format: - 314 AUTONEG
- Associated alarm message - Auto Negotiation Failure
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an AUTONEG with faultdefinition - clear is received.

### **15 NONPREFLINK**

- Alarm Format: - 315 NONPREFLINK
- Associated alarm message - Non Preferred Link is active
- Severity: Critical
- Cause: Network Problem
- Action: This alarm will be cleared when an NONPREFLINK with faultdefinition - clear is received.

## **2.5 Related documentation**

None

## ***Configuration for A00007000***

### **3.1 Hardware and Software Requirements**

The MG9000 and MG9000 software load that supports GIGE should be available.

### **3.2 Initial Configuration**

The MG9000 should be configured as GIGE from the LCI. The EM user will be able to view the link details once the MG9000 is configured.

### **3.3 Upgrade Considerations**

Since a new SCG card has been added to support this feature in SN08, there will not be any upgrade changes.

### **3.4 Element Management**

MG9000 Element manager will be used to manage the GigE MG9000.

The EM user will be able to view the GigE link configuration details, GigE alarms, PMs and OMs. The user will also be able to view and provision clock sync data, link protection data, and VLAN related data for the GigE ports and links. Details are provided in the respective sections

The audit on the administrative status of the GigE cards and links will be done if a mismatch is found. The data audit will be done if mismatch is found in any data provisioned from EM for clock sync, thresholds and bandwidth. The MG9000 will be the master in all these cases.

#### **3.4.1 New/modified GUIs**

**Table 1 New or modified GUIs**

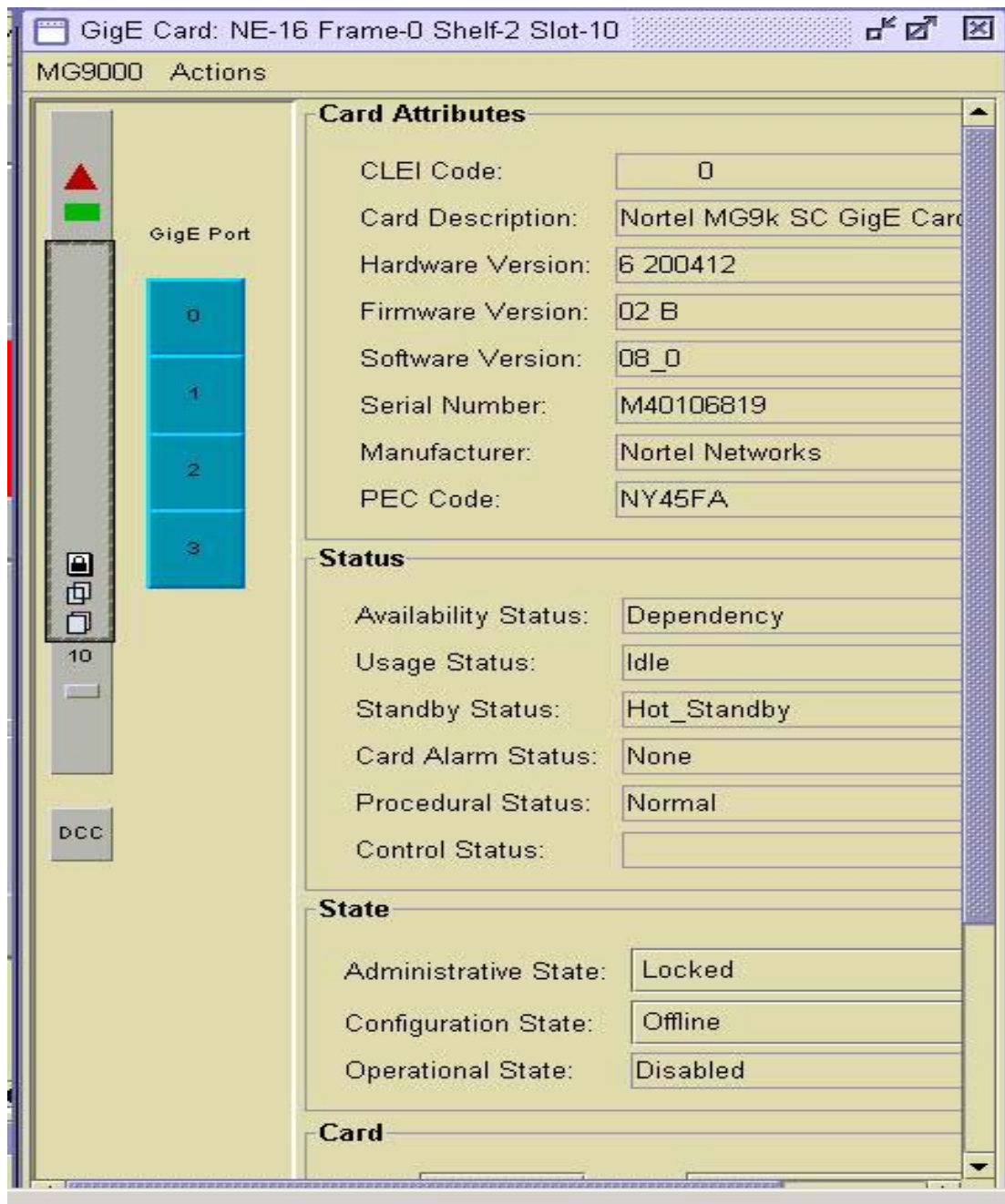
| <b>GUI name</b>     | <b>NEW, CHANGED, or DELETED</b> |
|---------------------|---------------------------------|
| GigECardView        | NEW                             |
| GigEPortView        | NEW                             |
| GigELinkProtection  | NEW                             |
| BandWidthManager    | NEW                             |
| VLAN                | NEW                             |
| Performance Browser | CHANGED                         |
| LinkIntegrityView   | NEW                             |

## **3.4.2 GUI information**

### **3.4.2.1 GUI name: GigeCardView**

#### **3.4.2.1.1 Functional description.**

Each SCG card has four ports. The card view can be opened from the shelf view. The card view shows totally four ilog graphics for the ports as shown in the following figure. Clicking on each of them opens the GigePortView.

**Figure 3 Card view**

#### 3.4.2.2 GUI name: GigePortView

The GigePortView will be opened when the user double clicks on the SCG card's port icon in the card view. The port view displays port/link attributes and its provisioning information as shown in Figures 2 and 3.

#### **3.4.2.2.1 Functional description.**

The port/Link attributes are shown in 'Link Details' tab.

The 'Link Controls' tab allows the user to provision link information. Once the WAN ports (active and inactive) are configured from the LCI, the EM user will be able to set any port as the inactive WAN port on the inactive GIGE card. To change the inactive port, the current WAN port should be offlined and the new port should be online. The port can be online in the 'Link Controls' tab.

If the user tries to change the inactive WAN port (i.e. online the new port) without changing the existing WAN port's configuration status to offline, an error message that 'the existing WAN port should be offlined' will be displayed to the user.

If the user tries to change the WAN port on the active card, an error message 'The WAN port is active, port cannot be changed' will be displayed to the user.

The user will be able to change administrative status and configuration status for the port. The EM user will not be able to change the administrative and configuration status of the active WAN port.

The loopback status is not modified in SN08 as loopback is not supported. The Tx RFI and Rx RFI will be 'ON' by default. When it is enabled, RFI alarms will be raised and receiving an RFI alarms will result in sparing activity. When the RFI is disabled the RFI alarms will not be sent to EM.

The user should specify the number of SES to 1 UAS. It will not be set by default. When the value is changed a warning message that the '<number> of SES set to one UAS' will be displayed to the user.

The Rx excessive error ratio and Rx signal degrade thresholds can be provisioned for each port.

**Figure 4 Link details**

GigE Port: NE-16 Frame-0 Shelf-2 Slot-10 Port -0

MG9000 Actions

Link Details **Link Controls**

Port Attributes

Description: Gigabit Ethernet Link

MAC Address: 00:60:38:63:34:63

Port Type: Ethernet CSMA/CD

Optics Type: 0

Link Attributes

Link Type: Primary NI

Auto-negotiation Mode: Enabled

Auto-negotiation Status: Other

Duplex: Full Duplex

Speed in bps: 1000000

Pause Admin Mode: Disabled

MTU Size: 1600

Local Advertised Values

Duplex: 44544

Speed in bps: 44544

Pause Admin Mode: 44544

Partner Advertised Values

Duplex: 0

Speed in bps: 0

Pause Admin Mode: 0

GigE Port Alarms

Critical: 0 Minor: 0



**Figure 5 Link Controls information**

GigE Port: NE-16 Frame-0 Shelf-2 Slot-10 Port -0

MG9000 Actions

Link Details | **Link Controls**

**Status**

Administrative status: LOCKED

Configuration status: OFFLINE

Operational status: Disabled

**State**

Loopback: No Loop

Tx RFI: Disable

Rx RFI: Disable

Bw/Link in bps: 1000000000

**Soak Values**

UAS Count: 10

SES Percent: 20

**Threshold Crossings**

Rx EER in percent: 21

Rx SD in percent: 10

Apply

GigE Port Alarms

Critical: 0 Minor: 0

#### 3.4.2.2.2 GUI usage and implications

The portview should be opened from the GigE card view.

### 3.4.2.2.3 GUI size

**Table 2 New or modified GUIs**

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| GigePortView         | 1                 | 8                 |                       |
|                      |                   |                   |                       |

### 3.4.2.2.4 GUI fields

The GUI fields for the GigePortLinkView.

**Table 3 GUI field descriptions**

| Field                | New or Changed | Subfield | Entry | Explanation and action                              | Associated MIB entry          |
|----------------------|----------------|----------|-------|-----------------------------------------------------|-------------------------------|
| sDescription         | New            | -        | -     | Displays the port description                       | ifDesc                        |
| sPhyAddress          | New            | -        | -     | Physical address of the port                        | ifPhysAddress                 |
| iPortType            | New            | -        | -     | port type                                           | ifType                        |
| iOpticsType          | New            | -        | -     | optics type                                         | ifMAuTypeListBits             |
| ilinkType            | New            |          |       | Specifies whether the link is network or subtending | nnGLinkConfigNiOrSubtending   |
| iAutoNeg             | New            | -        | -     | autonegotiation variable                            | ifMauAutoNegAdminStatus       |
| iDuplex              | New            | -        | -     |                                                     | dot3StatsDuplexStatus         |
| iSpeed               | New            | -        | -     |                                                     | ifHighSpeed                   |
| iMtu                 | New            | -        | -     |                                                     | ifMtu                         |
| pauseAdminMode       | New            | -        | -     | Link attribute's pause admin mode                   | dot3PauseAdminMode            |
| locAdvDuplex         | New            | -        | -     | Local advertised duplex                             | ifMauAutoNegCapAdvertisedBits |
| locAdvSpeed          | New            | -        | -     | Local advertised speed values                       | ifMauAutoNegCapAdvertisedBits |
| locAdvPauseAdminMode | New            | -        | -     | Local advertised Pause Admin Mode                   | ifMauAutoNegCapAdvertisedBits |

**Table 3 GUI field descriptions**

| <b>Field</b>         | <b>New or Changed</b> | <b>Subfield</b> | <b>Entry</b> | <b>Explanation and action</b>         | <b>Associated MIB entry</b>       |
|----------------------|-----------------------|-----------------|--------------|---------------------------------------|-----------------------------------|
| parAdvDuplex         | New                   | -               | -            | Partner advertised duplex             | ifMauAutoNegRemoteFaultAdvertised |
| parAdvPauseAdminMode | New                   | -               | -            | partner advertised pause admin mode   | ifMauAutoNegRemoteFaultAdvertised |
| parAdvSpeed          | New                   | -               | -            | Partner advertised speed              | ifMauAutoNegRemoteFaultAdvertised |
| linkAdminStatus      | New                   | -               | -            | Admin state of the link               | ifAdminStatus                     |
| linkConfigStatus     | New                   | -               | -            | Configuration state of the link       | nnGLinkConfigOnlineStatus         |
| linkOperStatus       | New                   | -               | -            | Operational state of the link         | ifOperStatus                      |
| loopbackState        | New                   | -               | -            | tells whether the loopback is enabled | nnGLinkConfigLoopback             |
| Tx RFI               | New                   | -               | -            | Link State                            | nnGLinkConfigTxRfi                |
| Rx RFI               | New                   | -               | -            | Link State                            | nnGLinkConfigRxRfi                |
| iUasCount            | New                   | -               | -            | UAS count                             | nnGLinkSoakCountUAS               |
| iSESPercent          | New                   | -               | -            | no. of SES for 1 UAS                  | nnGLinkSoakPercentSES             |
| RxEER                | New                   | -               | -            |                                       | nnGLinkFaultConfigAlmDef          |
| RxSD                 | New                   | -               | -            |                                       | nnGLinkFaultConfigAlmDef          |
| RxSD                 | New                   | -               | -            |                                       | nnGLinkFaultConfigAlmDef          |

### 3.4.2.3 GUI name: GigeLinkProtection

#### 3.4.2.3.1 Functional description

The Link Protection Group should be enabled for the link protection to be enabled. The Link protection can be invoked from the shelfview. The user will be able to specify the protection group number, protection group type, working (preferred) link and protected (non-preferred) link. In SN08, only one protection group of type 1:1 is supported. The user can also enable/disable

Link Reversion mode. When it is enabled, the working channel is always preferred. The system will swact to it when it is available again. The wait to revert time should be specified by the user. By default, the Wait to revert time is 600 sec. This option will be available only for the active and inactive WAN ports. To switch to the other link, the cards need to be swacted.

.Link Protection Provisioning

The screenshot shows a window titled "GigE Protection Provisioning View" with a sub-header "MG9000". The window contains several input fields and buttons. The "Protection Group Number" is set to "1". The "Select Group Number" dropdown is also set to "1". The "Protection Group Type" is set to "1:1". The "Protection Mode" is set to "Revertive". The "Wait To Revert in sec:" field is set to "200". Below these fields are three buttons: "Create Group", "Delete Group", and "Modify Group". At the bottom of the window are two buttons: "Refresh" and "Close".

The Link protection status can be viewed for each link from the GigELinkProtectionView from the Actions submenu of GigePortView as shown in the following figure.

**Figure 6 Link Protection status**

### 3.4.2.3.2 GUI usage and implications

### 3.4.2.3.3 GUI size

**Table 4 New or modified GUIs**

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| GigeProtection       | 1                 | 2                 |                       |
| GigeProvisioning     | 1                 | 1                 |                       |

### 3.4.2.3.4 GUI fields

The GUI fields for the GigePortLinkView.

**Table 5 GUI field descriptions**

| Field           | New or Changed | Subfield | Entry | Explanation and action  | Associated MIB entry    |
|-----------------|----------------|----------|-------|-------------------------|-------------------------|
| protGroupNumber | New            | -        | -     | Protection Group Number | nnGLinkProtGrpType      |
| protGroupType   | New            | -        | -     | protection group type   | nnGLinkProtGrpType      |
| protMode        | New            | -        | -     | Protection mode         | nnGLinkProtGrpRevertive |

**Table 5 GUI field descriptions**

| Field        | New or Changed | Subfield | Entry | Explanation and action  | Associated MIB entry   |
|--------------|----------------|----------|-------|-------------------------|------------------------|
| waitToRevert | New            | -        | -     | No.of seconds to revert | nnGLinkProtGrpWaitTime |
| prefLink     | New            |          |       | Preferred link          |                        |
| nonPrefLink  | New            | -        | -     | Non preferred link      |                        |

### 3.4.2.4 GUI name: Bandwidth Manager

#### 3.4.2.4.1 Functional description

In SN08, the Private lines and DSL services are not supported. The following network interface bandwidth data will be monitored: current ITP voice usage, current ABI voice usage and Overall network interface utilization. The data will be displayed in bits/second for GIGE systems. Bandwidth partitioning will also be supported in GIGE. The bandwidth manager panel can be viewed from the Services submenu. The bandwidth manager view has the following details:

**Figure 7 Bandwidth Partitioning View**

NE-160 Bandwidth Manager

MG9000

Managing

Partition Threshold

Maximum Partitionable Bandwidth

Partition Enabled ☐ Yes ☒ No

Bearer  %  bits/sec

Upper Bound  bits/sec

Network Interface  bits/sec

Apply

Refresh

**Figure 8 Bandwidth threshold managing**

The screenshot shows the NE-160 Bandwidth Manager interface. At the top, there is a title bar with a small icon and the text "NE-160 Bandwidth Manager". Below this is a green header bar with the text "MG9000". The main content area has a green background and contains the following elements:

- A "Managing" label at the top center.
- Two tabs: "Partition" (selected) and "Threshold".
- A "Managing Threshold Setting" label in the center.
- A "Bandwidth Congestion Threshold" label followed by a text input field containing "80.0" and a "%" symbol.
- An "Apply" button below the input field.
- A "Refresh" button at the bottom right.

**Figure 9 Bandwidth network Interface View**

The screenshot shows the Bandwidth network Interface View. At the top, there are three tabs: "Network Interface", "Per Shelf", and "Utilization" (selected). The main content area has a green background and contains the following elements:

- A "Currently Reserved Bandwidth" label in the center.
- A table with three rows and four columns:

|            |                                |   |                                         |
|------------|--------------------------------|---|-----------------------------------------|
| ITP Bearer | <input type="text" value="0"/> | % | <input type="text" value="0"/> bits/sec |
| ABI Bearer | <input type="text" value="0"/> | % | <input type="text" value="0"/> bits/sec |
| Total      | <input type="text" value="0"/> | % | <input type="text" value="0"/> bits/sec |

**Figure 10 Bandwidth reserved per shelf**

Monitoring

Network Interface Per Shelf Utilization

| Frame | Shelf | Bandwidth(%) | Bandwidth(bits/sec) |
|-------|-------|--------------|---------------------|
| 0     | 2     | 0            | 0                   |

Close

**Figure 11 Bandwidth utilization view**

Monitoring

Network Interface Per Shelf Utilization

Network Interface Bandwidth Utilization

Mean Ingress Rate  %  bits/sec

Mean Egress Rate  %  hits/sec

Close



### 3.4.2.5 Bandwidth Manager IP solution

There is slight modification in bandwidth manager GUI for IP solution

Earlier the bandwidth manager GUI was same for both AAL1 and IP solutions. The existing GUI holds good for AAL1 solution. There are slight changes in IP solution bandwidth manager GUI. The changes are in Partition panel, Priority panel and the Network Interface panel.

Partition panel: There are 2 partitions, Bearer and DSL.

Each of the partitions will have three fields: percent, bandwidth in cps, and max value in cps (this is the upper bound).

When provisioning a partition percent, the corresponding bandwidth is calculated from the upper bound,

i.e.  $\% * \text{upperbound} = \text{partition bandwidth}$ .

Total partitionable and the interface capacity will be displayed. The total percent will not be displayed in this case.

**Figure 12 Bandwidth manager partition panel for IP solution**

The screenshot shows the 'Managing' section of the 'NE-18 Bandwidth Manager' GUI. The 'Partition' tab is selected. The 'Maximum Partitionable Bandwidth' section contains a 'Partition Enabled' checkbox set to 'No'. Below this, there are two rows for partition settings: 'Bearer' and 'Guaranteed DSL'. Each row has three input fields: a percentage field (both set to 0), a bandwidth in cps field (both set to 0), and an upper bound field (both set to 340657). To the right of these fields, the 'Upper Bound' is displayed as 340657 cells/sec. Below the partition settings, the 'Total Partitionable' is shown as 340657 cells/sec, and the 'Network Interface' capacity is shown as 353207 cells/sec. At the bottom of the panel are 'Apply' and 'Refresh' buttons.

| Partition      | Percent | Bandwidth (cps) | Upper Bound (cells/sec) |
|----------------|---------|-----------------|-------------------------|
| Bearer         | 0       | 0               | 340657                  |
| Guaranteed DSL | 0       | 0               | 340657                  |

Total Partitionable: 340657 cells/sec  
Network Interface: 353207 cells/sec

Priority Panel: PLOA holding priority data is removed (as compared to AAL1 priority panel)

Network Interface Panel: PLOA data is removed from Network Interface tab (as compared to AAL1 Network Interface panel)

### 3.4.2.5.1 GUI usage and implications

### 3.4.2.5.2 GUI size

**Table 6** New or modified GUIs

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| BandwidthGige View   | 1                 | 1                 |                       |
| BandwidthView        | 1                 | 1                 |                       |

### 3.4.2.6 GUI name: VLAN

#### 3.4.2.6.1 Functional description

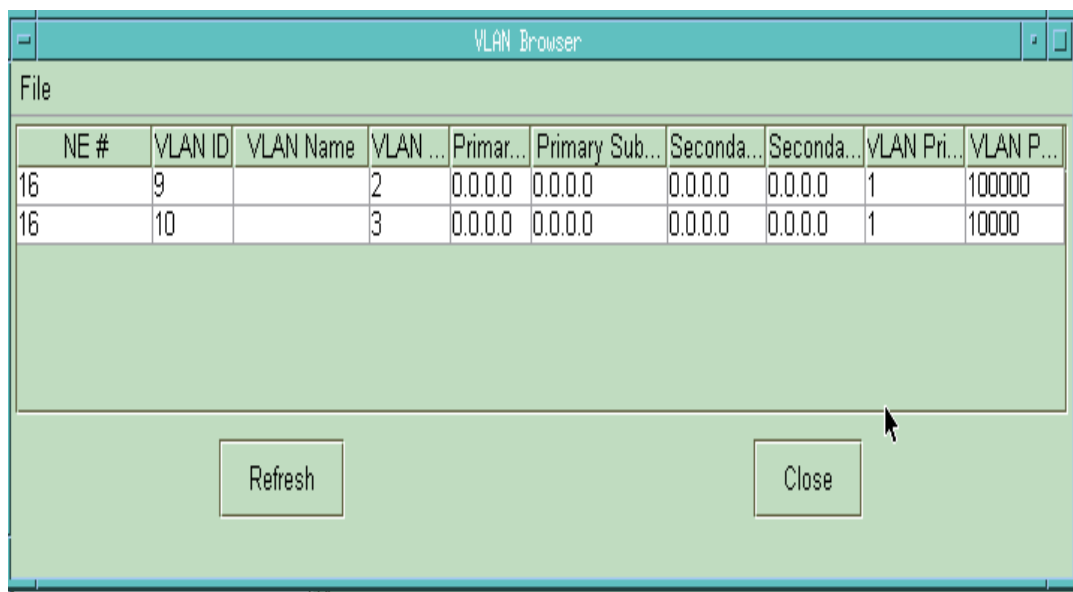
The user will be able to view the VLAN provisioning data from 'VLAN provisioning' view in the shelf view as shown in the figure. There are totally four VLAN IDs in SN08 release. The user will be able to change the Vlan name and peak rate for VLANs. The VLAN details will be displayed as shown in the following figure. If the Vlans are not provisioned, a message that "the vlan information is not provisioned yet" will be displayed to the user. There is VLAN browser provided from the subnet 'Configuration Submenu' to view the VLAN details for the GIGE nodes on the submenu.

**Figure 13 VLAN information**

The screenshot shows a window titled "NE-160 Vlan Manager" with a sub-header "MG9000". The main area is titled "Vlan Data" and contains a list of configuration fields for a VLAN. The fields are arranged in two columns. The first column lists the field names, and the second column contains the corresponding values in input boxes. The values are: VLAN\_ID: 5, VLAN\_NAME: man9, VLAN\_TYPE: OAMP, PRIORITY: 5, PEAK\_RATE: 900, PRIM\_SUBNET\_ADDR: 0.0.0.0, PRIM\_SUBNET\_MASK: 0.0.0.0, SEC\_SUBNET\_ADD: 0.0.0.0, and SEC\_SUBNET\_MASK: 0.0.0.0. At the bottom of the window, there are three buttons: "Refresh", "Apply", and "Close".

| Field            | Value   |
|------------------|---------|
| VLAN_ID          | 5       |
| VLAN_NAME        | man9    |
| VLAN_TYPE        | OAMP    |
| PRIORITY         | 5       |
| PEAK_RATE        | 900     |
| PRIM_SUBNET_ADDR | 0.0.0.0 |
| PRIM_SUBNET_MASK | 0.0.0.0 |
| SEC_SUBNET_ADD   | 0.0.0.0 |
| SEC_SUBNET_MASK  | 0.0.0.0 |

Buttons: Refresh, Apply, Close

**Figure 14 VLAN browser**

### 3.4.2.6.2 GUI usage and implications

### 3.4.2.6.3 GUI size

**Table 7 New or modified GUIs**

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| VLAN                 | 1                 | 1                 |                       |
| VlanBrowserView      | 1                 | 1                 |                       |

### 3.4.2.6.4 GUI fields

The GUI fields for the VLAN View.

**Table 8 GUI field descriptions**

| Field    | New or Changed | Subfield | Entry | Explanation and action                   | Associated MIB entry     |
|----------|----------------|----------|-------|------------------------------------------|--------------------------|
| vlanId   | New            | -        | -     | Port Vlan id each port belongs to a VLAN | ?                        |
| peakRate | New            | -        | -     | Peak Rate for the VLAN id                | nnGLinkVlanPeak Rate     |
| priority | New            | -        | -     | Priority of the VLAN                     | nnGLinkVlanUser Priority |

**Table 8 GUI field descriptions**

| Field       | New or Changed | Subfield | Entry | Explanation and action             | Associated MIB entry         |
|-------------|----------------|----------|-------|------------------------------------|------------------------------|
| IP Address  | New            | -        | -     | Primary subnet address of the VLAN | nnGLinkVlanPrimarySubnetAddr |
| Subnet Mask | New            | -        | -     | Primary Subnet mask of the VLAN    | nnGLinkVlanPrimarySubnetMask |
| VLAN Name   | New            | -        | -     | VLAN name                          | NNGLinkVlanName              |

### 3.4.2.7 GUI name: Performance Browser

#### 3.4.2.7.1 Functional description

The GigE feature introduces a Generic OM, Ethernet OM, RMON and PM data. The SMON data related to the VLAN is also displayed in the performance browser. The performance details are as shown in the following figures. The mib details are covered under the Performance section.

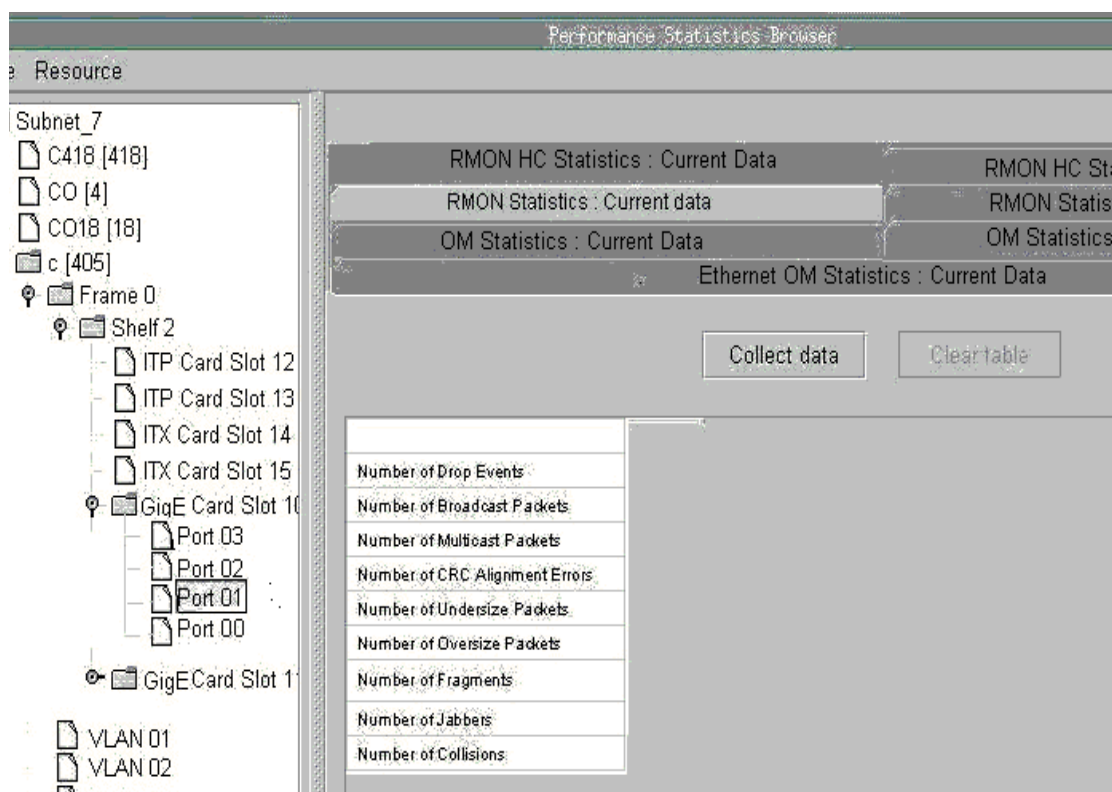
**Figure 15 RMON data**

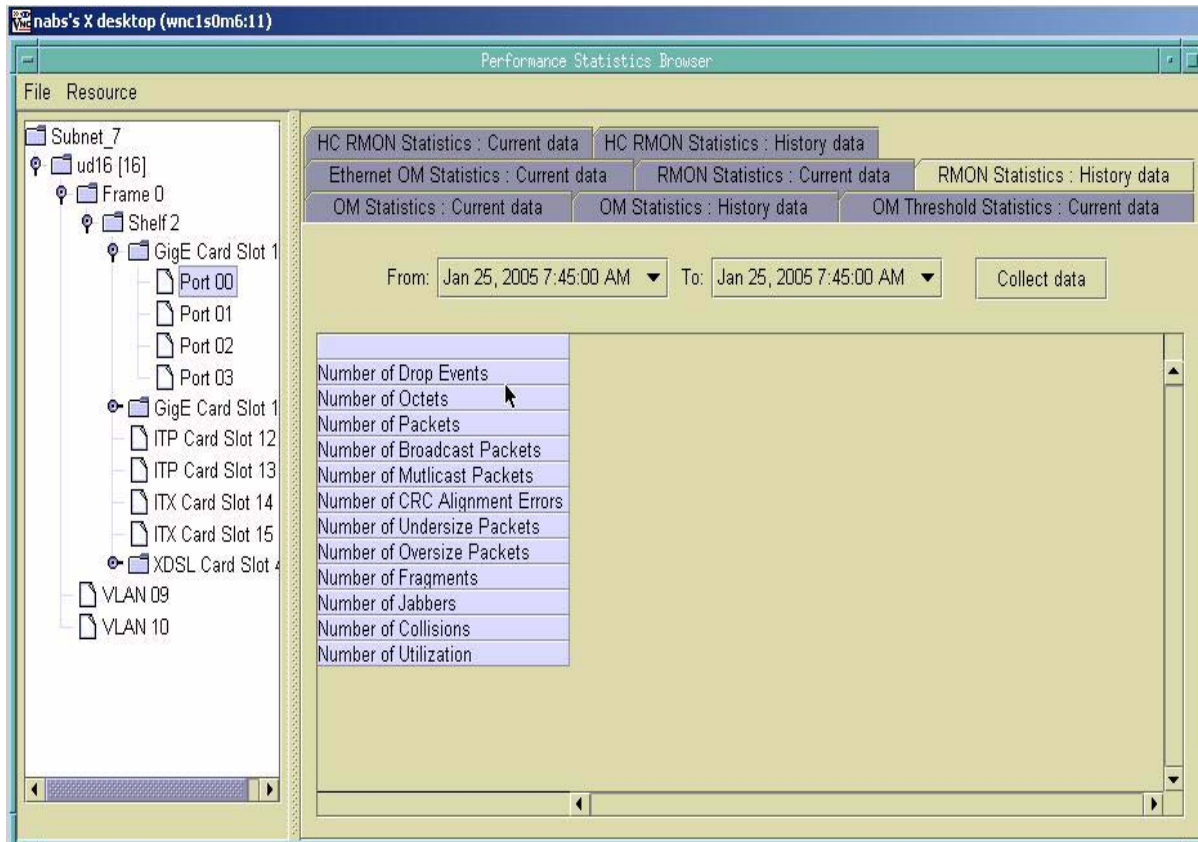
**Figure 16 RMON HC history data**

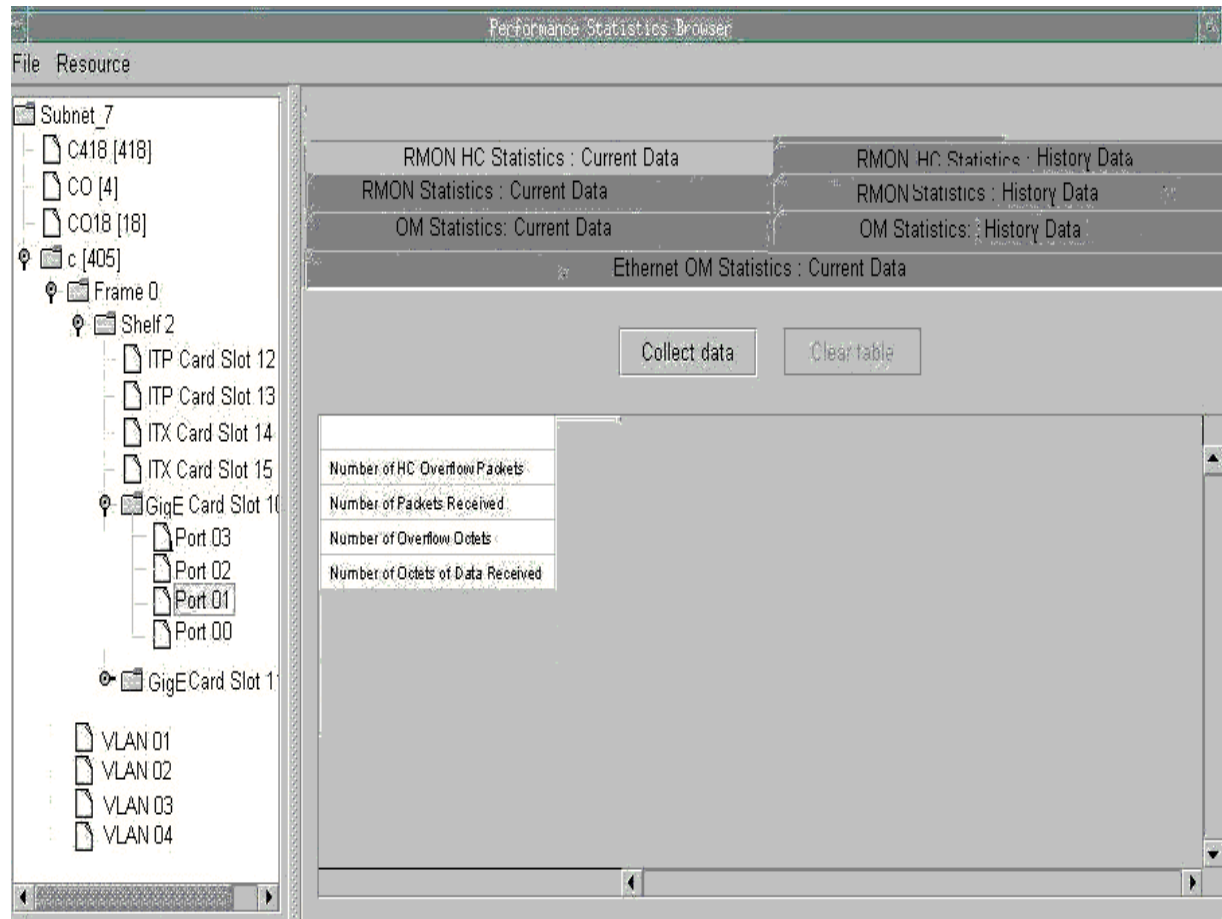
**Figure 17 RMON HC Current data**

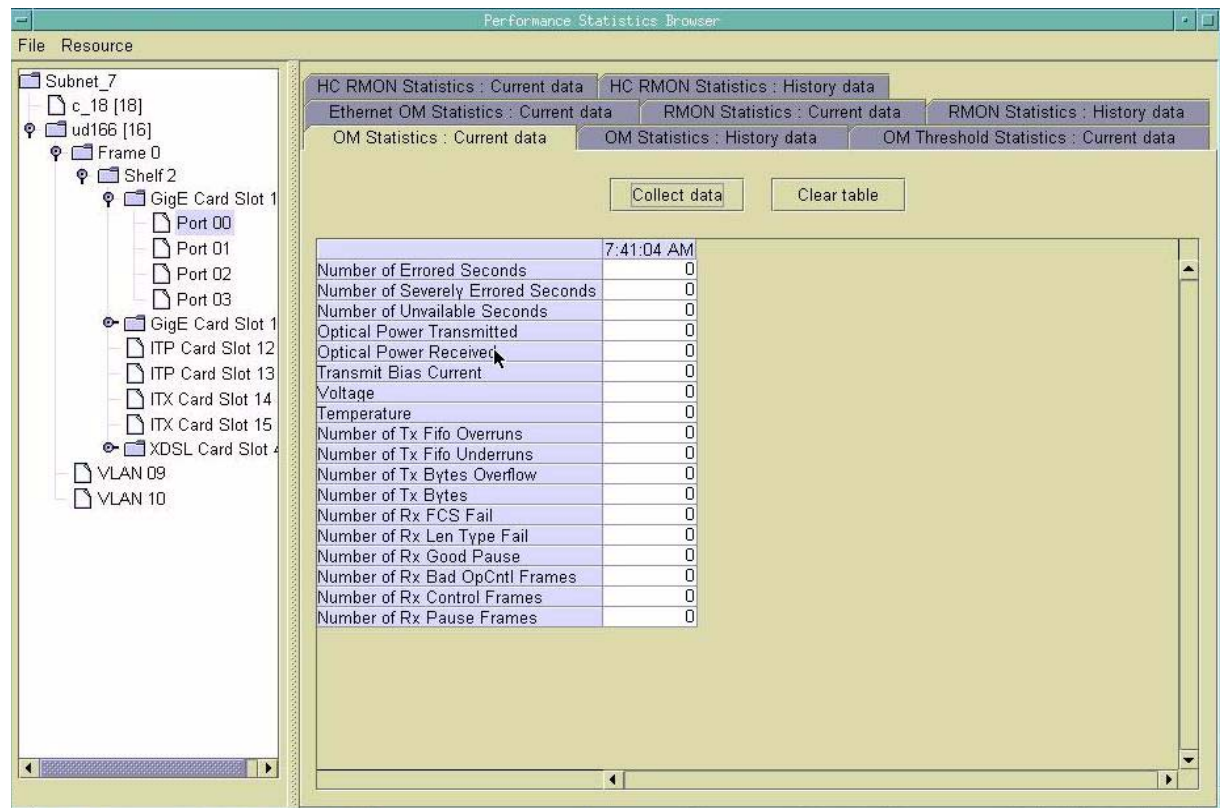
**Figure 18 Ethernet OM Data**



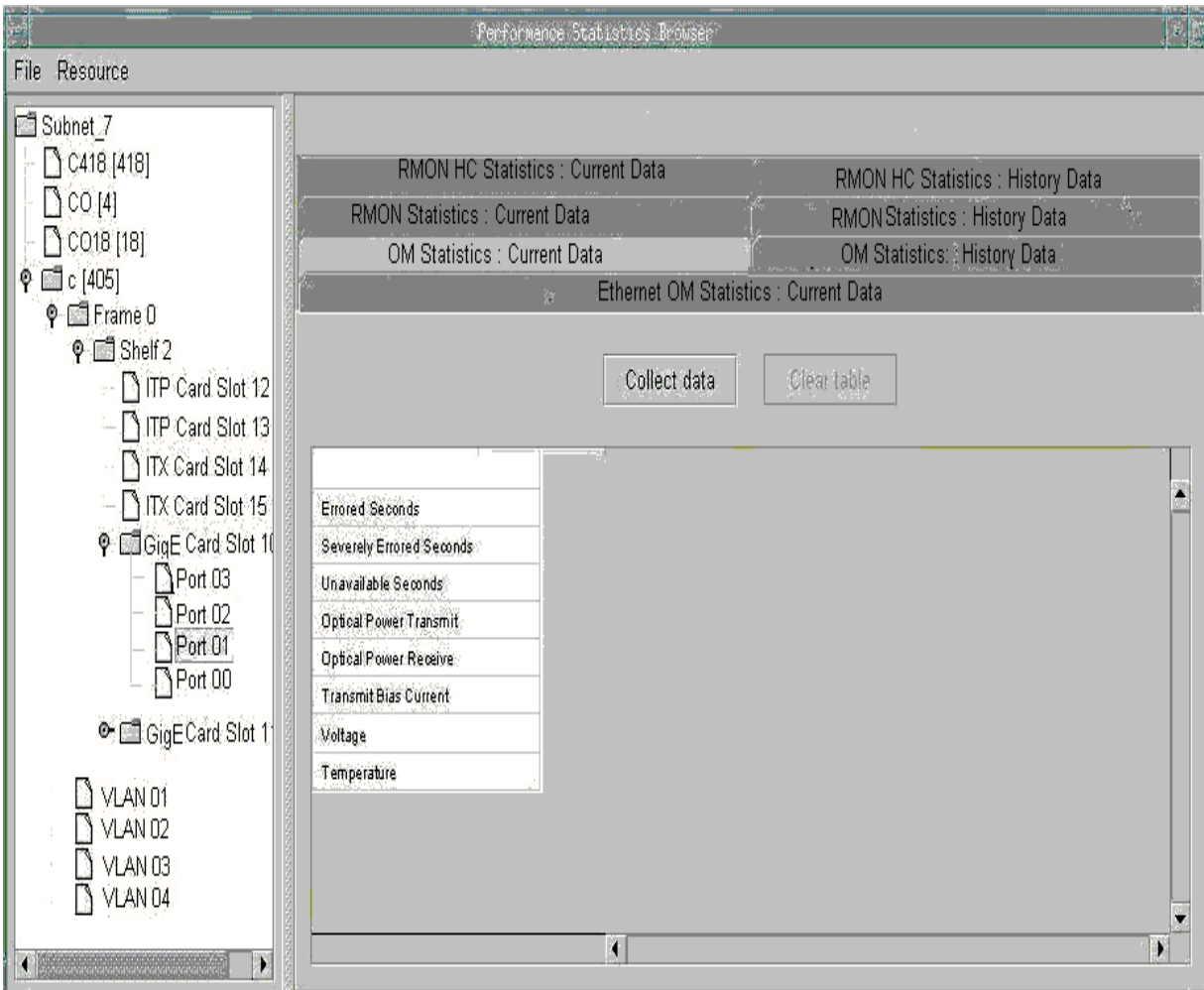
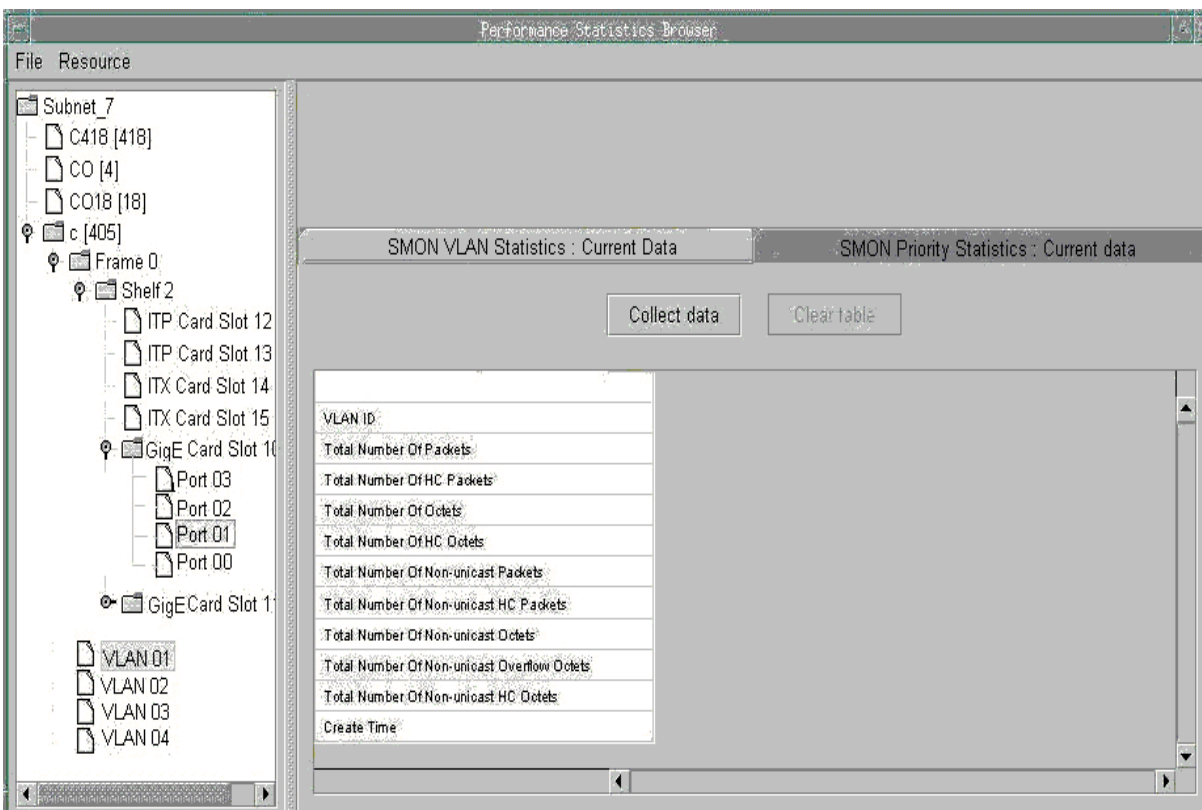
**Figure 19 Generic OM/PM Data**

**Figure 20 SMON VLAN Statistics****New or modified GUIs**

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| Performance Browser  | 1                 | 1                 |                       |
|                      |                   |                   |                       |

**3.4.2.7.2 GUI fields**

The GUI fields for the VLAN View.

**Table 9 GUI field descriptions**

| Field        | New or Changed | Subfield | Entry | Explanation and action | Associated MIB entry                          |
|--------------|----------------|----------|-------|------------------------|-----------------------------------------------|
| Generic OM - | New            | -        | -     |                        | IF-MIB (current and interval table)           |
| Ethernet PM  | New            | -        | -     |                        | dot3HCStatsTable (current and interval table) |

**Table 9 GUI field descriptions**

| <b>Field</b> | <b>New or Changed</b> | <b>Subfield</b> | <b>Entry</b> | <b>Explanation and action</b> | <b>Associated MIB entry</b>                |
|--------------|-----------------------|-----------------|--------------|-------------------------------|--------------------------------------------|
| Ethernet OM  | New                   | -               | -            |                               | dot3statEnrty (current and interval table) |
| SMON         | New                   | -               | -            |                               | smonPrioStatsTable, smonVlanIdStatsTable   |
| RMON         | New                   | -               | -            |                               | etherHistoryTable, etherStatsTable         |

### 3.4.2.8 GUI name: Link Integrity

#### 3.4.2.8.1 Functional description

The Link Integrity test can be invoked from the shelfview Maintenance submenu 'Link Integrity View'. The link integrity test will be run on a protection group. The details as shown in the following figure are displayed. The user should specify the threshold and the threshold interval. If the user does not specify any value, default values will be taken. The link integrity test can be enabled or disabled using the integrity monitoring field in the Link Integrity Monitoring View. The test will run every interval specified in the view. If the threshold crosses, an Link Integrity alarm will be raised. If there are no protection groups created, it gives a message that "The Link protection information is provisioned yet".

**Figure 21 Link Integrity view**

NE-160 Link Integrity

MG9000

Link Integrity Data

PROTECTION GROUP 42 ▼

LINK\_THRESHOLD 2

LINK\_INTERVAL 10

LINK\_STATUS ENABLE ▼

Refresh Apply Close

#### 3.4.2.8.2 GUI usage and implications

#### 3.4.2.8.3 GUI size

**Table 10 New or modified GUIs**

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory |
|----------------------|-------------------|-------------------|-----------------------|
| LinkIntegrity        | 1                 | 1                 |                       |
|                      |                   |                   |                       |

### 3.4.2.8.4 GUI fields

The GUI fields for the VLAN View.

**Table 11 GUI field descriptions**

| Field                | New or Changed | Subfield | Entry | Explanation and action       | Associated MIB entry          |
|----------------------|----------------|----------|-------|------------------------------|-------------------------------|
| Protection Group     | New            | -        | -     | Protection Group             | nnGLinkProtGrpNum             |
| Integrity threshold  | New            | -        | -     | threshold                    | nnGLinkProtGrpIntegThreshold  |
| Integrity Interval   | New            | -        | -     | Interval for the test to run | nnGLinkProtGrpIntegIntervalty |
| Integrity Monitoring | New            | -        | -     | yes or no                    | nnGLinkProtGrpIntegEnable     |

## *Performance Management for A00007000*

### 4.1 Performance management strategy

This follows the existing MG9K EM performance strategy wherein the data is collected 15 or 5/30 minutes for 96 intervals.

### 4.2 Performance management tools and utilities

The performance data can be viewed from the Performance browser.

### 4.3 Performance Measurements (PM), Operational Measurements (OM), and stats.

#### 4.3.1 OM Statistics

The new OM performance parameters introduced in this feature are:

##### 4.3.1.1 Errored Seconds

Component: OM Statistics

Performance measurement name: Errored Seconds

The Performance measurement description: counter associated with Errored Seconds

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

**4.3.1.2 Severely Errored Seconds**

Component: OM Statistics

Performance measurement name: Severely Errored Seconds

Performance measurement description: The counter associated with SES

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

**4.3.1.3 Unavailable seconds**

Component: OM Statistics

Performance measurement name: Unavailable Seconds

Performance measurement description: The counter associated with UAS

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

**4.3.1.4 Optical Power Transmit**

Component: OM Statistics

Performance measurement name: Optical Power Transmit

Performance measurement description: The counter associated with Optical Power Transmit

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

**4.3.1.5 Optical Power Receive**

Component: OM Statistics

Performance measurement name: Optical Power Receive

Performance measurement description: The counter associated with Optical Power Receive

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

**4.3.1.6 Transmit Bias Current**

Component: OM Statistics

Performance measurement name: Transmit Bias Current

Performance measurement description: The counter associated with Transmit Bias Current

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.7 Temperature**

Component: OM Statistics

Performance measurement name: Temperature

Performance measurement description: The counter associated with Temperature

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.8 Voltage**

Component: Generic OM

Performance measurement name: Voltage

Performance measurement description: The counter associated with Voltage

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.9 nnGLinkCurrTxFifoOverruns**

Component: Generic OM

Performance measurement name: Number of Tx Fifo Overruns

Performance measurement description: The counter associated with Number of Tx Fifo Overruns

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.10 nnGLinkCurrTxFifoUnderruns**

Component: Generic OM

Performance measurement name: Number of Tx Fifo Underruns

Performance measurement description: The counter associated with Number of Tx Fifo Underruns

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.11 nnGLinkCurrTxBytesOverflow**

Component: Generic OM

Performance measurement name: Number of Tx Bytes OverFlow

Performance measurement description: The counter associated with Number of Tx bytes overflow

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.12 nnGLinkCurrTxBytes**

Component: Generic OM

Performance measurement name: Number of Tx Bytes

Performance measurement description: The counter associated with Number of Tx bytes

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.13 nnGLinkCurrRxFcsFail**

Component: Generic OM

Performance measurement name: Number of Rx FCS Fails

Performance measurement description: The counter associated with Number of Rx fails

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.14 nnGLinkCurrRxFcsFail**

Component: Generic OM

Performance measurement name: Number of Rx FCS Fails



Performance measurement description: The counter associated with Number of Rx fails

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.15 nnGLinkCurrRxLenTypeFail**

Component: Generic OM

Performance measurement name: Number of Rx Len type fail

Performance measurement description: The counter associated with Number of Len type fails

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.16 nnGLinkCurrRxGoodPause**

Component: Generic OM

Performance measurement name: Number of Rx Good Pause

Performance measurement description: The counter associated with Number of Rx good pause

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.17 nnGLinkCurrRxGoodPause**

Component: Generic OM

Performance measurement name: Number of Rx Good Pause

Performance measurement description: The counter associated with Number of Rx good pause

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.18 nnGLinkCurrRxBadOpCntlFrames**

Component: Generic OM

Performance measurement name: Number of Rx bad op cntl frames

Performance measurement description: The counter associated with Number of Rx bad OpCntl frames

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

#### **4.3.1.19 nnGLinkCurrRxPauseFrames**

Component: Generic OM

Performance measurement name: Number of Rx control frames

Performance measurement description: The counter associated with Number of Rx control frames

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - OM Statistics

### **4.3.2 Ethernet OM**

#### **4.3.2.1 AlignErr**

Component: Ethernet OM

Performance measurement name: Number of Alignment Errors

Performance measurement description: The counter associated with AlignErr

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.2 FcsErr**

Component: FcsErr

Performance measurement name: Number of FCS Errors

Performance measurement description: The counter associated with FcsErr

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.3 Internalmacrxerr**

Component: Ethernet OM

Performance measurement name: Number of Internal MAC Receive Errors

Performance measurement description: The counter associated with Internalmacrxerr

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.4 Frtoolongs**

Component: Ethernet OM

Performance measurement name: Number of Frame Too Longs

Performance measurement description: The counter associated with Frtoolongs

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.5 Internalmactxerr**

Component: Ethernet OM

Performance measurement name: Number of Internal MAC TX Errors

Performance measurement description: The counter associated with Internalmactxerr

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.6 Symbolerr**

Component: Ethernet OM

Performance measurement name: Number of Symbol Errors

Performance measurement description: The counter associated with Symbolerr

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.7 Inpausefr**

Component: Ethernet OM

Performance measurement name: Number of Inpause Frames

Performance measurement description: The counter associated with Inpausefr

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistics

#### **4.3.2.8 Outpausefr**

Component: Ethernet OM

Performance measurement name: Number of Outpause Frames

Performance measurement description: The counter associated with Outpausefr

Element Manager Screen Name: MG9kEM Performance Browser

Collection Interval: NA

Element Manager Screen Name: GIGE Card/Port xx - Ethernet OM Statistic

### **4.3.3 RMON Data**

#### **4.3.3.1 etherStatsDropEvents**

Component: RMON

Performance measurement name: Number of Drop Events

Performance measurement description: The current data associated with etherStatsDropEvents

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.2 etherStatsBroadcastPkts**

Component: RMON

Performance measurement name: Number of Broadcast Packets

Performance measurement description: The counter data associated with etherStatsBroadcastPkts

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.3 etherStatsMulticastPkts**

Component: RMON

Performance measurement name: Number of Multicast Packets

Performance measurement description: The counter associated with etherStatsMulticastPkts

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.4 etherStatsCRCAlignErrors**

Component: RMON

Performance measurement name: Number of CRC Alignment Errors

Performance measurement description: The counter associated with etherStatsCRCAlignErrors

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.5 etherStatsUndersizePkts**

Component: RMON

Performance measurement name: Number of Undersize Packets

Performance measurement description: The counter associated with etherStatsUndersizePkts

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.6 etherStatsOversizePkts**

Component: RMON

Performance measurement name: Number of Oversize Packets

Performance measurement description: The counter associated with etherStatsOversizePkts

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.7 etherStatsFragments**

Component: RMON

Performance measurement name: Number of Fragments

Performance measurement description: The counter associated with etherStatsFragments

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.8 etherStatsJabbers**

Component: RMON

Performance measurement name: Number of Jabbers

Performance measurement description: The counter associated with etherStatsJabbers

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

#### **4.3.3.9 etherStatsCollisions**

Component: RMON

Performance measurement name: Number of Collisions

Performance measurement description: The counter associated with etherStatsCollisions

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON Statistics

### **4.3.4 RMON HC Statistics**

#### **4.3.4.1 HC Overflow Packets**

Component: RMON HC

Performance measurement name: Number of HC overflow packets

Performance measurement description: The counter associated with HC Overflow Packets

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC Statistics

#### **4.3.4.2 Packets Received**

Component: RMON HC

Performance measurement name: Number of packets received

Performance measurement description: The counter associated with number of packets received

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC Statistics

#### **4.3.4.3 Overflow octets**

Component: RMON HC

Performance measurement name: Number of overflow octets

Performance measurement description: The counter associated with HC number of Overflow octets

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC Statistics

#### **4.3.4.4 Octets of data received**

Component: RMON HC

Performance measurement name: Number of octets of data received

Performance measurement description: The counter associated with number of octets of data received.

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC Statistics

**Note:** These data will be displayed only in RMON HC History data.

#### **4.3.4.5 etherHistoryOctets**

Component: RMON HC

Performance measurement name: Number of ether history octets

Performance measurement description: The counter associated with number of ether history octets received.

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC History Statistics

#### **4.3.4.6 etherHistoryPkts**

Component: RMON HC

Performance measurement name: Number of ether history packets

Performance measurement description: The counter associated with number of ether history packets received.

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC History Statistics

#### **4.3.4.7 etherHistoryUtilization**

Component: RMON HC

Performance measurement name: Number of ether history utilization

Performance measurement description: The counter associated with number of history utilization received.

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: GIGE Card/Port xx - RMON HC History Statistics

### **4.3.5 SMON Statistics**

#### **4.3.5.1 VLAN ID**

Component: SMONVlanStats

Performance measurement name: VLAN ID

Performance measurement description: The VLAN ID

Element Manager Screen Name: VLANxx/SMONVLANStatistics

#### **4.3.5.2 Total number Packets**

Component: SMONVlanStats



Performance measurement name: Total number Packets

Performance measurement description: The counter associated with Total number Packets

Element Manager Screen Name: VLANxx/SMONVLANStatistics

#### **4.3.5.3 Total Number of HC Packets**

Component: SMONVlanStats

Performance measurement name: Total Number of HC Packets

Performance measurement description: The counter associated with Total Number of HC Packets

Element Manager Screen Name: VLANxx/SMONVLANStatistics

#### **4.3.5.4 Create Time**

Component: SMONVlanStats

Performance measurement name: Create time

Performance measurement description: create time

Element Manager Screen Name: VLANxx/SMONVLANStatistics

#### **4.3.5.5 Total Number of Octets**

Component: SMONVlanStats

Performance measurement name: Total Number of Octets

Performance measurement description: The counter associated with Total Number of Octets

Element Manager Screen Name: VLANxx/SMONVLANStatistics

#### **4.3.5.6 Total Number of HC Octets**

Component: SMONVlanStats

Performance measurement name: Total Number of HC Octets

Performance measurement description: The counter associated with Total Number of HC Octets

Element Manager Screen Name: VLANxx/SMONVLANStatistics

**4.3.5.7 Total number of non unicast packets**

Component: SMONVlanStats

Performance measurement name: Total number of non unicast packets

Performance measurement description: The counter associated with Total number of non unicast packets

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: VLANxx/SMONVLANStatistics

**4.3.5.8 Total number of non unicast HC octets**

Component: SMONVlanStats

Performance measurement name: Total number of non unicast HC octets

Performance measurement description: The counter associated with Total number of non unicast HC octets

Element Manager Screen Name: VLANxx/SMONVLANStatistics

**4.3.5.9 Total number of non unicast octet**

Component: SMONVlanStats

Performance measurement name: Total number of non unicast octet

Performance measurement description: The counter associated with Total number of non unicast octet

Element Manager Screen Name: VLANxx/SMONVLANStatistics

Total number of non unicast over flow octet

Total number of non unicast over flow octet

**4.3.5.10 Total Number of Non Unicast Over Flow Octet**

Component: SMONVlanStats

Performance measurement name: Total number of non unicast over flow octets

Performance measurement description: The counter associated with Total number of non unicast over flow octets

Collection Interval: 15 or 5/30 mins

Element Manager Screen Name: VLANxx/SMONVLANStatistics

#### **4.3.5.11 Total number of non unicast HC octets**

Component: SMONVlanStats

Performance measurement name: Total number of non unicast HC octets

Performance measurement description: The counter associated with Total number of non unicast HC octets

Element Manager Screen Name: VLANxx/SMONVLAN Statistics

### **4.3.6 SMON Priority Statistics**

#### **4.3.6.1 Total number of packets**

Component: SMON Priority Statistics

Performance measurement name: Total number of packets

Performance measurement description: It displays the total number of packets

Element Manager Screen Name: VLANxx/SMON Priority Statistics

#### **4.3.6.2 Total number of overflow packets**

Component: SMON Priority Statistics

Performance measurement name: Total number of overflow packets

Performance measurement description: It displays the total number of overflow packets

Element Manager Screen Name: VLANxx/SMON Priority

#### **4.3.6.3 Total number of HC packets**

Component: SMON Priority Statistics

Performance measurement name: Total number of HC packets

Performance measurement description: It displays the total number of HC packets

Element Manager Screen Name: VLANxx/SMON Priority Statistics

#### **4.3.6.4 Total number of octets**

Component: SMON Priority Statistics

Performance measurement name: Total number of octets

Performance measurement description: It displays the total number of octets

Element Manager Screen Name: VLANxx/SMON Priority Statistics

#### **4.3.6.5 Total number of overflow octets**

Component: SMON Priority Statistics

Performance measurement name: Total number of overflow octets

Performance measurement description: It displays the total number of overflow octets

Element Manager Screen Name: VLANxx/SMON Priority Statistics

#### **4.3.6.6 Total number of HC octets**

Component: SMON Priority Statistics

Performance measurement name: Total number of HC octets

Performance measurement description: It displays the total number of HC octets

Element Manager Screen Name: VLANxx/SMON Priority Statistics

***Product = MG 9000***

## **A00007074--GigE Link Maintenance**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

Link maintenance provides two major areas of functionality for the GigE physical link, configuration and monitoring.

##### **1.2.1 Configuration**

Attributes for each of the links are provisioned by the LCI and maintained by Link Maintenance. Attributes include the auto-negotiation parameters and service state for a given link.

Link protection groups are managed as well. Protection group types and the link to protection group mappings are associated in link maintenance. Currently only 1+1 protection groups are supported in SN08. Revertive behavior is provided allowing preferred paths through the network.

A complete listing of the setable attributes can be found in the MIB section of the CN.

### **1.2.2 Monitoring**

Link maintenance provides the operational interface for each of the GigE ports. The service state of each port can be changed and the operational state reported. On going service metrics are collected and reportable through the MIBs. Threshold crossings are also reported if so provisioned.

When configured, link maintenance provides a means to ensure that each link in a protection group is both transmitting and receiving data. This heartbeat is bi-directional between the links and uses a layer 2 frame. Frames are sent periodically between the links and verified at the receiving link. Manual testing is available through the LCI.

Link maintenance maintains and reports fault conditions of each port. These include events such as loss of signal. Recovery actions are taken if possible to provide continuing service. Types of faults and actions are detailed in the FM section of this document.

## **1.3 Hardware Requirements or Dependencies**

Not Applicable

## **1.4 Software Requirements or Dependencies**

Not Applicable

## **1.5 Limitations and restrictions**

Not applicable.

## **1.6 Interactions**

Link Maintenance interacts with the following systems for configuration and operational management:

- CMT
- LCI

## 1.7 Glossary

| Term | Description           |
|------|-----------------------|
| GigE | Gigabit Ethernet      |
| LCI  | Local Craft Interface |

### *Fault Management for A00007074*

## 2.1 Fault management strategy

Currently the GigE interfaces uses a 1+1 protection group redundancy model. A link is provisioned on each of the SGC cards into a protection group. When a service affecting fault is detected on the active link the SGC cards will be spared if possible to gain service on the other link. Crossovers are not supported so the link and card activity match.

## 2.2 Fault management tools and utilities

The EM and LCI provide an interface for viewing the faults currently and historically on an interface. Tools are provided fault isolation including traceroute. The link intergroup test is available to provide information and isolation of faults both within the NE and the connected network.

## 2.3 Logs

Logs are generated for threshold crossings that occur and system errors. Logs are sent through the EM to the log stream. The log stream can then be monitored for craft to take appropriate action including contacting Nortel Networks for analysis.

The format is detailed in A00007000, GigE EM.

## 2.4 Alarms

The following alarms and recovery actions can occur:

**Table 5: GigE alarms**

| Alarm | Severity | Description             | System Action | Craft Action |
|-------|----------|-------------------------|---------------|--------------|
| LOS   | Critical | Loss of signal          | Spare         | None         |
| RFI   | Critical | Remote fault indication | Spare         | None         |
| TXF   | Critical | Transmit failure        | Spare         | None         |

**Table 5: GigE alarms**

| Alarm        | Severity       | Description                           | System Action        | Craft Action                                    |
|--------------|----------------|---------------------------------------|----------------------|-------------------------------------------------|
| AutoNeg      | Critical       | Autonegotiation failed                | Spare                | None                                            |
| RxEER        | Major          | Receive excessive errors              | Spare                | None                                            |
| LINT         | Link Integrity | failure of one link to communicate    | Spare if active link | None                                            |
| LKINT        | Major          | external failure for link integrity   | None                 | isolate fault hosting network                   |
| TEM          | Minor          | Temperature                           | None                 | replace card                                    |
| POW          | Minor          | Power                                 | None                 | replace card                                    |
| RxSD         | Minor          | Receive signal degraded               | None                 | isolate path introducing errors                 |
| TBC          | Minor          | Bias Current                          | None                 | replace card                                    |
| OPT          | Minor          | Optical transmit                      | None                 | replace card                                    |
| OPR          | Minor          | Optical receive                       | None                 | replace far end equipment                       |
| NONPRE-FLINK | Minor          | active link is not the preferred link | None                 | isolate and recover fault on the preferred link |

The format is detailed in A00007000, GigE EM.

## 2.5 Related documentation

Feature A00007000 FM.

## ***Configuration for A00007074***

### **2.6 Hardware and Software Requirements**

Not Applicable.

### **2.7 Initial Configuration**

Not Applicable

### **2.8 Office/Subnet parameters (OP/SP) (CM & SESM)**

Not Applicable

### **2.9 Upgrade Considerations**

Not Applicable

### **2.10 Data schema (DS) (CM, MIBS, RDB)**

#### **2.10.1 New/modified tables, MIBs, or Database Schema**

**Table 12 New or modified tables**

| <b>Table/MIB name</b>         | <b>NEW/CHANGED/ or DELETED/</b> | <b>Table Control (NEW/OLD/UNCHANGED)</b> |
|-------------------------------|---------------------------------|------------------------------------------|
| ifEntry table                 | Changed                         | Changed                                  |
| ifMauEntry                    | New                             | New                                      |
| ifJackEntry                   | New                             | New                                      |
| ifMauAutoNegEntry             | New                             | New                                      |
| dot3Stats                     | New                             | New                                      |
| dot3HCStatsEntry              | New                             | New                                      |
| dot3PauseEntry                | New                             | New                                      |
| EtherStatsEntry               | New                             | New                                      |
| MediaIndependentEntry         | New                             | New                                      |
| EtherStatsHighCapacityEntry   | New                             | New                                      |
| EtherHistoryEntry             | New                             | New                                      |
| EtherHistoryHighCapacityEntry | New                             | New                                      |
| nnGLinkConfigTable            | New                             | New                                      |
| nnGLinkFaultConfigTable       | New                             | New                                      |
| nnGLinkThresholdTable         | New                             | New                                      |



**Table 12 New or modified tables**

| Table/MIB name        | NEW/CHANGED/ or DELETED/ | Table Control (NEW/OLD/UNCHANGED) |
|-----------------------|--------------------------|-----------------------------------|
| nnGLinkSoakTable      | New                      | New                               |
| nnGLinkProtGroupTable | New                      | New                               |
| nnGLinkOmCurrTable    | New                      | New                               |
| nnGLinkOmIntervTable  | New                      | New                               |

## 2.10.2 Table/MIB/Remote Database Schema information

### 2.10.2.1 Name: ifEntry table

#### 2.10.2.1.1 Functional description

A list of interface entries. The number of entries is given by the value of ifNumber. This table has been modified to allow for Gige specific values. See RFC2863 for details.

#### 2.10.2.1.2 Size

**Table 13 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| ifEntry                | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

#### 2.10.2.1.3 Fields/OIDs

The following table lists fields/OIDs for ifEntry Table.

**Table 14 Table field descriptions**

| Field  | Default                                 | Read/Write Access | Size          | Note |
|--------|-----------------------------------------|-------------------|---------------|------|
| ifDesc | “Nortel-pec-frame-shelf-slot-port-gige” | Read              | DisplayString |      |
| ifType | ethernetCsmacd                          | Read              | IANAifType    |      |
| ifMtu  | 1600                                    | Read              | Integer32     |      |

**Table 14 Table field descriptions**

| Field                  | Default                   | Read/Write Access | Size        | Note |
|------------------------|---------------------------|-------------------|-------------|------|
| ifSpeed                | 1000000000<br>bps         | Read              | Gauge32     |      |
| ifPhysAddress          | “mac<br>address”          | Read              | PhysAddress |      |
| ifAdmin                | Down                      | Read/Write        | Integer     |      |
| ifOper                 | notPresent                | Read              | Integer     |      |
| ifLastChange           | 0                         | Read              | Timeticks   |      |
| ifName                 | “protgroup-<br>slot-port” | Read              |             |      |
| ifLinkUpDownTrapEnable | enabled                   | Read/Write        | Integer     |      |
| ifHighSpeed            | 1000                      | Read              | Gauge32     |      |
| ifConnectorPresent     | true                      | Read              | Truth value |      |
|                        |                           |                   |             |      |

### 2.10.2.2 Name: ifMauEntry table

#### 2.10.2.2.1 Functional description

Table of descriptive and status information about MAU(s) attached to an interface. See RFC3636 for details

#### 2.10.2.2.2 Size

**Table 15 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| ifMauEntry             | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

#### 2.10.2.2.3 Fields/OIDs

The following table lists fields/OIDs for ifMauEntry Table.

**Table 16 Table field descriptions**

| Field                             | Default                     | Read/Write Access | Size               | Note |
|-----------------------------------|-----------------------------|-------------------|--------------------|------|
| ifMauIfIndex                      | ifindex<br>from rfc<br>2863 | read              | InterfaceIn<br>dex |      |
| ifMauIndex                        | 0                           | read              | ifMauIndex         |      |
| ifMauType                         | unknownMa<br>uType          | read              | Autonomoust<br>ype |      |
| ifMauStatus                       | Shutdown or<br>unknown      | read              | INTEGER            |      |
| ifMauMediaAvailable               |                             | read              | INTEGER            |      |
| ifMauMediaAvailableSta<br>teExits |                             | read              | Counter32          |      |
| ifMauJabberState                  | noJabber                    | read              | INTEGER            |      |
| ifMauJabberingStateEnt<br>ers     | 0                           | read              | Counter32          |      |
| ifMauDefaultType                  |                             | Read-write        | Autonomoust<br>ype |      |
| ifMauAutoNegSupported             | true                        | read              | TruthValue         |      |
| ifMauTypeListBits                 |                             | read              | BITS               | 2    |
| ifMauHCFALSECarriers              |                             |                   | Counter64          | 1    |

Note 1) Unknown whether the hardware can support this counter

Note 2) bits b1000baseXFD(22),b1000baseLXFD(24),b1000baseSXFD(26), and b1000baseCXFD(28) will be set.

### 2.10.2.3 Name: ifJackEntry table

#### 2.10.2.3.1 Functional description

Information about the external jacks attached to MAUs attached to an interface. See RFC3636 for details

### 2.10.2.3.2 Size

**Table 17 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| <b>ifJackEntry</b>     | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.3.3 Fields/OIDs

The following table lists fields/OIDs for ifJackEntry Table.

**Table 18 Table field descriptions**

| Field                | Default | Read/Write Access | Size      | Note |
|----------------------|---------|-------------------|-----------|------|
| ifJackIndex          | ifIndex | Not-accessible    | Integer32 |      |
| ifJackType           | 0       | read              | JackType  | 1    |
| ifMauHCFALSECarriers |         |                   | Counter64 | 1    |

Note 1) if unsupported jack type raise fault and don't allow link to unlock

## 2.10.2.4 Name: IfMauAutoNegEntry table

### 2.10.2.4.1 Functional description

Configuration and status objects for the auto-negotiation function of MAUs attached to interfaces. The ifMauAutoNegTable applies to systems in which auto-negotiation is supported on one or more MAUs attached to interfaces. Note that if auto-negotiation is present and enabled, the ifMauType object reflects the result of the auto-negotiation function." See RFC3636 for details

### 2.10.2.4.2 Size

**Table 19 Table size**

| Abbreviated table name   | Minimum tuples | Maximum tuples | Information on memory                                    |
|--------------------------|----------------|----------------|----------------------------------------------------------|
|                          |                |                |                                                          |
| <b>IfMauAutoNegEntry</b> | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.4.3 Fields/OIDs

The following table lists fields/OIDs for IfMauAutoNegEntry Table.

**Table 20 Table field descriptions**

| Field                             | Default     | Read/Write Access | Size    | Note |
|-----------------------------------|-------------|-------------------|---------|------|
| ifMauAutoNegAdminStatus           | enabled     | Read-write        | INTEGER |      |
| ifMauAutoNegRemoteSignaling       | notdetected | read              | INTEGER |      |
| ifMauAutoNegConfig                | configuring | read              | INTEGER |      |
| ifMauAutoNegRestart               | norestart   | Read-write        | INTEGER |      |
| ifMauAutoNegCapabilityBits        |             | read              | BITS    | 1    |
| ifMauAutoNegCapAdvertisedBits     |             | Read-write        | BITS    | 1    |
| ifMauAutoNegCapReceiveBits        | 0           | read              | BITS    |      |
| ifMauAutoNegRemoteFaultAdvertised | offline     | Read-write        | INTEGER |      |
| ifMauAutoNegRemoteFaultReceived   | noerror     | read              | INTEGER |      |

Note 1) bits

bfdxPause(8),bfdxAPause(9),bfdxSPause(10),bfdxBPause(11),bfdxbaseXFD(13) will be set

### 2.10.2.5 Name: dot3stats table

#### 2.10.2.5.1 Functional description

Configuration and status objects for the Dot3 stats function of each interface. See RFC3635 for details

### 2.10.2.5.2 Size

**Table 21 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| <b>dot3stats</b>       | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.5.3 Fields/OIDs

The following table lists fields/OIDs for dot3stats Table.

**Table 6: RFC3635 dot3stats table**

| ifdot3StatsEntryField                | Default Value | Read/Write Access | size           |
|--------------------------------------|---------------|-------------------|----------------|
| dot3StatsIndex                       | ifIndex       | read              | InterfaceIndex |
| dot3StatsSingleCollisionFrames       | 0             | read              | Counter32      |
| dot3StatsMultipleCollisionFrames     | 0             | read              | Counter32      |
| dot3StatsSQETestErrors               | 0             | read              | Counter32      |
| dot3StatsDeferredTransmissions       | 0             | read              | Counter32      |
| dot3StatsLateCollisions              | 0             | read              | Counter32      |
| dot3StatsExcessiveCollisions         | 0             | read              | Counter32      |
| dot3StatsCarrierSenseErrors          | 0             | read              | Counter32      |
| dot3StatsDuplexStatus                | fullDuplex    | read              | INTEGER        |
| dot3StatsRateControlAbility          | true          | read              | TruthValue     |
| dot3StatsRateControlStatus           | unknown       | read              | INTEGER        |
| dot3HCStatsAlignmentErrors           | 0             | read              | Counter64      |
| dot3HCStatsFCSErrors                 | 0             | read              | Counter64      |
| dot3HCStatsInternalMacTransmitErrors | 0             | read              | Counter64      |
| dot3HCStatsFrameTooLongs             | 0             | read              | Counter64      |
| dot3HCStatsInternalMacReceiveErrors  | 0             | read              | Counter64      |
| dot3HCStatsSymbolErrors              | 0             | read              | Counter64      |

## 2.10.2.6 Name: dot3pauseentry Table

### 2.10.2.6.1 Functional description

Configuration and status objects for the Dot3 pause function of each interface.  
See RFC3635 for details

### 2.10.2.6.2 Size

**Table 22 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| <b>dot3pauseentry</b>  | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.6.3 Fields/OIDs

The following table lists fields/OIDs for dot3PauseEntry Table.

**Table 7: RFC3635 dot3PauseEntry table**

| ifdot3PauseEntryField | Default Value     | Read/Write Access | size      |
|-----------------------|-------------------|-------------------|-----------|
| dot3PauseAdminMode    | enabledXmitAndRcv | Read-write        | INTEGER   |
| dot3PauseOperMode     | enabledXmitAndRcv | read              | INTEGER   |
| dot3InPauseFrames     | 0                 | read              | Counter32 |
| dot3OutPauseFrames    | 0                 | read              | Counter32 |
| dot3HCInPauseFrames   | 0                 | read              | Counter64 |
| dot3HCOutPauseFrames  | 0                 | read              | Counter64 |

indexed by ifIndex

## 2.10.2.7 Name: Etherstatsentry Table

### 2.10.2.7.1 Functional description

Configuration and status objects for the ethernet statistics function of each interface. See RFC2819 for details

### 2.10.2.7.2 Size

**Table 23 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| <b>etherstatsentry</b> | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.7.3 Fields/OIDs

The following table lists fields/OIDs for EtherStatsEntry Table.

**Table 8: RFC 2819 EtherStatsEntry**

| Attribute       | Default  | Access | Type      | Note |
|-----------------|----------|--------|-----------|------|
| etherStatsIndex | IF index | Read   | Integer32 |      |

|                          |                         |      |                   |   |
|--------------------------|-------------------------|------|-------------------|---|
| etherStatsDataSource     | 0                       | Read | OBJECT IDENTIFIER |   |
| etherStatsDropEvents     | 0                       | Read | Counter32         |   |
| etherStatsBroadcastPkts  | 0                       | Read | Counter32         |   |
| etherStatsMulticastPkts  | 0                       | Read | Counter32         |   |
| etherStatsCRCAlignErrors | 0                       | Read | Counter32         |   |
| etherStatsUndersizePkts  | 0                       | Read | Counter32         |   |
| etherStatsOversizePkts   | 0                       | Read | Counter32         |   |
| etherStatsFragments      | 0                       | Read | Counter32         |   |
| etherStatsJabbers        | 0                       | Read | Counter32         | 1 |
| etherStatsCollisions     | 0                       | Read | Counter32         | 1 |
| etherStatsOwner          | “Frame,shelf,slot,port” | Read | OwnerString       |   |
| etherStatsStatus         | invalid                 | Read | EntryStatus       |   |

Note 1: Not collected, always zero

### 2.10.2.8 Name: MediaIndependentEntry Table

#### 2.10.2.8.1 Functional description

Configuration and status objects for the Media Independent statistics function of each interface. See RFC3273 for details

#### 2.10.2.8.2 Size

Table 24 Table size

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| MediaIndependentEntry  | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

#### 2.10.2.8.3 Fields/OIDs

The following table lists fields/OIDs for MediaIndependentEntry Table.



**Table 9: RFC 3273 MediaIndependentEntry**

| Attribute                                 | Default                                        | Access | Type              |
|-------------------------------------------|------------------------------------------------|--------|-------------------|
| mediaIndependentIndex                     | IF index                                       | Read   | Integer32         |
| mediaIndependentDataSource                | ifIndex.y where y is one of our port ifindexes | Read   | OBJECT IDENTIFIER |
| mediaIndependentDropEvents                | 0                                              | Read   | Counter32         |
| mediaIndependentDroppedFrames             | 0                                              | Read   | Counter32         |
| mediaIndependentInOverflowPkts            | 0                                              | Read   | Counter32         |
| mediaIndependentInHighCapacityPkts        | 0                                              | Read   | Counter64         |
| mediaIndependentOutOverflowPkts           | 0                                              | Read   | Counter32         |
| mediaIndependentOutHighCapacityPkts       | 0                                              | Read   | Counter64         |
| mediaIndependentInOverflowOctets          | 0                                              | Read   | Counter32         |
| mediaIndependentInHighCapacityOctets      | 0                                              | Read   | Counter64         |
| mediaIndependentOutOverflowOctets         | 0                                              | Read   | Counter32         |
| mediaIndependentOutHighCapacityOctets     | 0                                              | Read   | Counter64         |
| mediaIndependentInNUCastOverflowPkts      | 0                                              | Read   | Counter32         |
| mediaIndependentInNUCastHighCapacityPkts  | 0                                              | Read   | Counter64         |
| mediaIndependentOutNUCastOverflowPkts     | 0                                              | Read   | Counter32         |
| mediaIndependentOutNUCastHighCapacityPkts | 0                                              | Read   | Counter64         |
| mediaIndependentInErrors                  | 0                                              | Read   | Counter32         |
| mediaIndependentOutErrors                 | 0                                              | Read   | Counter32         |
| mediaIndependentInputSpeed                | 1000000                                        | Read   | Gauge32           |
| mediaIndependentOutputSpeed               | 1000000                                        | Read   | Gauge32           |
| mediaIndependentDuplexMode                | fullduplex(2)                                  | Read   | INTEGER           |
| mediaIndependentDuplexChanges             | 0                                              | Read   | Counter32         |
| mediaIndependentDuplexLastChange          | 0                                              | Read   | TimeStamp         |
| mediaIndependentOwner                     | "Frame,shelf,slot,port"                        | Read   | OwnerString       |
| mediaIndependentStatus                    | ???                                            | Read   | RowStatus         |

### 2.10.2.9 Name: EtherStatshighCapacityEntry Table

#### 2.10.2.9.1 Functional description

Configuration and status objects for the Ethernet high capacity statistics function of each interface. See RFC3273 for details

#### 2.10.2.9.2 Size

**Table 25 Table size**

| Abbreviated table name             | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------------------|----------------|----------------|----------------------------------------------------------|
| <b>EtherStatshighCapacityEntry</b> | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.9.3 Fields/OIDs

The following table lists fields/OIDs for EtherStatshighCapacity Table.

**Table 10: RFC 3273 EtherStatshighCapacityEntry**

| Attribute                                          | Default | Access | Type      | Note |
|----------------------------------------------------|---------|--------|-----------|------|
| etherStatsHighCapacityOverflowPkts                 | 0       | Read   | Counter32 |      |
| etherStatsHighCapacityPkts                         | 0       | Read   | Counter64 |      |
| etherStatsHighCapacityOverflowOctets               | 0       | Read   | Counter32 |      |
| etherStatsHighCapacityOctets                       | 0       | Read   | Counter64 |      |
| etherStatsHighCapacityOverflowPkts64Octets         | 0       | Read   | Counter32 | 1    |
| etherStatsHighCapacityPkts64Octets                 | 0       | Read   | Counter64 | 1    |
| etherStatsHighCapacityOverflowPkts65to127Octets    | 0       | Read   | Counter32 | 1    |
| etherStatsHighCapacityPkts65to127Octets            | 0       | Read   | Counter64 | 1    |
| etherStatsHighCapacityOverflowPkts128to255Octets   | 0       | Read   | Counter32 | 1    |
| etherStatsHighCapacityPkts128to255Octets           | 0       | Read   | Counter64 | 1    |
| etherStatsHighCapacityOverflowPkts256to511Octets   | 0       | Read   | Counter32 | 1    |
| etherStatsHighCapacityPkts256to511Octets           | 0       | Read   | Counter64 | 1    |
| etherStatsHighCapacityOverflowPkts512to1023Octets  | 0       | Read   | Counter32 | 1    |
| etherStatsHighCapacityPkts512to1023Octets          | 0       | Read   | Counter64 | 1    |
| etherStatsHighCapacityOverflowPkts1024to1518Octets | 0       | Read   | Counter32 | 1    |
| etherStatsHighCapacityPkts1024to1518Octets         | 0       | Read   | Counter64 | 1    |

indexed by ifIndex

Note 1: Not collected, always zero

### 2.10.2.10 Name: EtherHistoryEntry Table

#### 2.10.2.10.1 Functional description

Configuration and status objects for the Ethernet historical statistics function of each interface. See RFC2819 for details

#### 2.10.2.10.2 Size

**Table 26 Table size**

| Abbreviated table name   | Minimum tuples | Maximum tuples | Information on memory                                    |
|--------------------------|----------------|----------------|----------------------------------------------------------|
| <b>EtherHistoryEntry</b> | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

#### 2.10.2.10.3 Fields/OIDs

The following table lists fields/OIDs for EtherHistoryEntry Table.

**Table 11: RFC 2819 EtherHistoryEntry**

| Attribute                  | Default  | Access | Type      | Note |
|----------------------------|----------|--------|-----------|------|
| etherStatsIndex            | IF index | Read   | Integer32 |      |
| etherHistorySampleIndex    | 0        | Read   | Integer32 |      |
| etherHistoryIntervalStart  | 0        | Read   | TimeTicks |      |
| etherHistoryDropEvents     | 0        | Read   | Counter32 |      |
| etherHistoryBroadcastPkts  | 0        | Read   | Counter32 |      |
| etherHistoryMulticastPkts  | 0        | Read   | Counter32 |      |
| etherHistoryCRCAlignErrors | 0        | Read   | Counter32 |      |
| etherHistoryUndersizePkts  | 0        | Read   | Counter32 |      |
| etherHistoryOversizePkts   | 0        | Read   | Counter32 |      |
| etherHistoryFragments      | 0        | Read   | Counter32 |      |
| etherHistoryJabbers        | 0        | Read   | Counter32 | 1    |
| etherHistoryCollisions     | 0        | Read   | Counter32 | 1    |
| etherHistoryUtilization    | 0        | Read   | Integer32 |      |

Note 1: Not collected, always zero

### 2.10.2.11 Name: EtherHistoryHighCapacityEntry Table

#### 2.10.2.11.1 Functional description

Configuration and status objects for the Ethernet High Capacity historical statistics function of each interface. See RFC2819 for details

#### 2.10.2.11.2 Size

**Table 27 Table size**

| Abbreviated table name               | Minimum tuples | Maximum tuples | Information on memory                                    |
|--------------------------------------|----------------|----------------|----------------------------------------------------------|
| <b>EtherHistoryHighCapacityEntry</b> | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

#### 2.10.2.11.3 Fields/OIDs

The following table lists fields/OIDs for EtherHistoryHighCapacityEntry Table.

**Table 12: RFC 3273 EtherHistoryHighCapacityEntry**

| Attribute                              | Default | Access | Type                | Note |
|----------------------------------------|---------|--------|---------------------|------|
| etherHistoryHighCapacityOverflowPkts   | 0       | Read   | Integer32           |      |
| etherHistoryHighCapacityPkts           | 0       | Read   | CounterBasedGauge64 |      |
| etherHistoryHighCapacityOverflowOctets | 0       | Read   | Gauge32             |      |
| etherHistoryHighCapacityOctets         | 0       | Read   | CounterBasedGauge64 |      |

indexed by etherStatsIndex and etherHistorySampleIndex

## 2.10.2.12 Name: nnGLinkConfigTable table

### 2.10.2.12.1 Functional description

The GiGE Link Config Table contains management information for each GigE Link. Allows the Manager to config and Manage these links. There is one entry per GigE Link (port). See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>

### 2.10.2.12.2 Size

**Table 28 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| nnGLinkConfigTable     | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.12.3 Fields/OIDs

The following table lists fields/OIDs for nnGLinkConfigTable Table.

**Table 29 Table field descriptions**

| Field                       | Default      | Read/Write Access | Size       | Note |
|-----------------------------|--------------|-------------------|------------|------|
| nnGLinkConfigIfIndex        | ifIndex      | Not-accessible    | Integer32  |      |
| nnGLinkConfigWorkOrProt     | notUsed      | Read-write        | INTEGER    |      |
| nnGLinkConfigNiOrSubtending | notUsed      | Read-write        | INTEGER    |      |
| nnGLinkProtGrpNum           | nullprtgrp=0 | Read-write        | Unsigned32 |      |
| nnGLinkConfigTxRfi          | enabled      | Read-write        | INTEGER    |      |
| nnGLinkConfigRxRfi          | enabled      | Read-write        | INTEGER    |      |
| nnGLinkConfigIfPromMode     | notPromMode  | Read-write        | INTEGER    |      |
| nnGLinkConfigIfMtu          | 1600         | Read              | Integer32  |      |
| nnGLinkConfigLoopBack       | noLoop       | Read-write        | INTEGER    |      |

**Table 29 Table field descriptions**

| Field                      | Default | Read/Write Access | Size      | Note  |
|----------------------------|---------|-------------------|-----------|-------|
| nnGLinkConfigStatusCurrent | 0       | Read              | INTEGER   |       |
| nnGLinkConfigPriority      | 1       | Read-write        | Integer32 |       |
| nnGLinkConfigOnlineStatus  | offLine | Read-write        | INTEGER   |       |
| nnGLinkConfigLaserStatus   | off     | Read              | INTEGER   |       |
| nnGlinkForce               | false   | Read-write        | INTEGER   | new   |
| nnGlinkBandWidth           | 1000?   | Read-write        | INTEGER   | new 1 |

Note 1) In megabits to 2 decimal points, i.e. 1.67????

### **2.10.2.13 Name: nnGLinkFaultConfigTable**

#### **2.10.2.13.1 Functional description**

The Fault Config Table maps Faults/Alarms to desired Severity. It allows manager to modify the alarmSeverity and to shutdown notification of these alarms, on each interface and for each Fault/Alarm type. There is one entry in this table for each Link and FaultType Pair, indexed by the ifIndex of the Link, and FaultType. See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>. In SN08 this table will be filled in with defaults only as the Element Manager will have interface to change them.

**2.10.2.13.2 Size****Table 30 Table size**

| Abbreviated table name  | Minimum tuples | Maximum tuples | Information on memory                                                       |
|-------------------------|----------------|----------------|-----------------------------------------------------------------------------|
| nnGLinkFaultConfigTable | 8x16           | 8x16           | Memory is automatically allocated for 8 GigE interfaces and 16 fault types. |

**2.10.2.13.3 Fields/OIDs**

The following table lists fields/OIDs for nnGLinkFaultConfigTable.

**Table 31 Table field descriptions**

| Field                      | Default | Read/Write Access | Size             | Note |
|----------------------------|---------|-------------------|------------------|------|
| nnGLinkFaultConfigType     |         | na                | NnGLinkFaultType |      |
| nnGLinkFaultConfigNotify   |         | Read-write        | INTEGER          | 1    |
| nnGLinkFaultConfigSeverity |         | Read-write        | INTEGER          | 1    |
| nnGLinkFaultConfigSoak     |         | Read-write        | INTEGER          | 1    |
| nnGLinkFaultConfigAlmDef   |         | Read-write        | INTEGER          | 1    |

Note 1) defaults are dependent of fault type.

**2.10.2.14 Name: nnGLinkThresholdTable****2.10.2.14.1 Functional description**

The Threshold Table allows the Manager to configure Performance Thresholds for which the Agent will generate a Threshold Notifications when the performance Counter (Type) is crossed. There is one entry in this table for each Link / Threshold Counter Type pair (doubly indexed) default ratios:

| Type | ShortPeriod Crossing | LongPeriod Crossing |
|------|----------------------|---------------------|
| ES   | 5%                   | 5%                  |
| SES  | 5%                   | 5%                  |

UAS            1%            1%

See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>.

#### 2.10.2.14.2 Size

**Table 32 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                                          |
|------------------------|----------------|----------------|--------------------------------------------------------------------------------|
| nnGLinkThresholdTable  | 8x3            | 8x3            | Memory is automatically allocated for 8 GigE interfaces and 3 Threshold types. |

#### 2.10.2.14.3 Fields/OIDs

The following table lists fields/OIDs for nnGLinkThresholdTable.

**Table 33 Table field descriptions**

| Field                    | Default | Read/Write Access | Size                 | Note |
|--------------------------|---------|-------------------|----------------------|------|
| nnGLinkThreshType        |         | na                | NnGLinkThresholdType |      |
| nnGLinkThreshShortPeriod |         | Read              | Unsigned32           |      |
| nnGLinkThreshShortRatio  |         | Read-write        | NnGLinkPercent       | 1    |
| nnGLinkThreshLongPeriod  |         | Read              | Unsigned32           |      |
| nnGLinkThreshLongRatio   |         | Read-write        | NnGLinkPercent       | 1    |
| nnGLinkThreshNotify      | notify  | Read-write        | NnGLinkPercent       |      |

Note 1) defaults are dependent of threshold type.

### 2.10.2.15 Name: nnGLinkSoakTable

#### 2.10.2.15.1 Functional description

The Soak Table allows the Manager to configure Performance Counter soak times/values. There is one entry in this table for each GigE Link. The GR 253, GR 474 defines the standard soak times for performance counters but since

certain customer networks run at different network quality levels where such networks require the soak times to be configurable so that management stations do not get flooded with PM threshold crossings.

See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>.

### 2.10.2.15.2 Size

**Table 34 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| nnGLinkSoakTable       | 8              | 8x3            | Memory is automatically allocated for 8 GigE interfaces. |

### 2.10.2.15.3 Fields/OIDs

The following table lists fields/OIDs for nnGLinkSoakTable.

**Table 35 Table field descriptions**

| Field                 | Default | Read/Write Access | Size       | Note |
|-----------------------|---------|-------------------|------------|------|
| nnGLinkSoakCountUAS   |         | Read-write        | Unsigned32 |      |
| nnGLinkSoakPercentSES |         | Read-write        | Unsigned32 |      |

## 2.10.2.16 Name: nnGLinkProtGroupTable

### 2.10.2.16.1 Functional description

The GigE Protection Group Table manages the Link Protection Group Configuration. There is one entry in this table for each protection Group, typically 1 per MG9k. This is a Manager Create Table.

See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>.



**2.10.2.16.2 Size****Table 36 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory |
|------------------------|----------------|----------------|-----------------------|
| nnGLinkProtGroupTable  | 0              | 8              | only 1 in sn08        |

**2.10.2.16.3 Fields/OIDs**

The following table lists fields/OIDs for nnGLinkProtGroupTable.

**Table 37 Table field descriptions**

| Field                        | Default | Read/Write Access | Size       | Note |
|------------------------------|---------|-------------------|------------|------|
| nnGLinkProtGrpNumber         |         | Read-create       | Unsigned32 |      |
| nnGLinkProtGrpRevertive      |         | Read-create       | INTEGER    |      |
| nnGLinkProtGrpType           |         | Read-create       | INTEGER    |      |
| nnGLinkProtGrpWaitTime       |         | Read-create       | Unsigned32 |      |
| nnGLinkProtGrpIntegThreshold |         | Read-create       | Unsigned32 |      |
| nnGLinkProtGrpIntegInterval  |         | Read-create       | Unsigned32 |      |
| nnGLinkProtGrpIntegEnable    |         | Read-create       | INTEGER    |      |
| nnGLinkProtGrpStatus         |         | read-only         | INTEGER    |      |
| nnGLinkProtGrpLastChg        |         | read-only         | TimeStamp  | new  |
| nnGLinkProtGrpRowStatus      |         | Read-create       | RowStatus  |      |

### 2.10.2.17 Name: nnGLinkOmCurrTable

#### 2.10.2.17.1 Functional description

The GigE Link OM Table contains Operational Measurements per Link, there is one entry per Link

See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>.

**Table 38 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                    |
|------------------------|----------------|----------------|----------------------------------------------------------|
| nnGLinkOmCurrTable     | 8              | 8              | Memory is automatically allocated for 8 GigE interfaces. |

#### 2.10.2.17.2 Fields/OIDs

The following table lists fields/OIDs for nnGLinkOmCurrTable.

**Table 39 Table field descriptions**

| Field            | Default | Read/Write Access | Size       | Note |
|------------------|---------|-------------------|------------|------|
| nnGLinkCurrESs   |         | read-only         | Unsigned32 |      |
| nnGLinkCurrSESSs |         | read-only         | Unsigned32 |      |
| nnGLinkCurrUASs  |         | read-only         | Unsigned32 |      |
| nnGLinkCurrOPT   |         | read-only         | Unsigned32 |      |
| nnGLinkCurrOPR   |         | read-only         | Unsigned32 |      |
| nnGLinkCurrTBC   |         | read-only         | Unsigned32 |      |
| nnGLinkCurrVCC   |         | read-only         | Unsigned32 |      |
| nnGLinkCurrTEMP  |         | read-only         | Unsigned32 |      |
| txFifoOverruns   |         | read-only         | Unsigned64 | new  |
| txFifoUnderruns  |         | read-only         | Unsigned64 | new  |
| txBytesOverFlow  |         | read-only         | Unsigned32 | new  |
| txBytes          |         | read-only         | Unsigned64 | new  |

**Table 39 Table field descriptions**

| Field                 | Default | Read/Write Access | Size       | Note |
|-----------------------|---------|-------------------|------------|------|
| rxFcsFail             |         | read-only         | Unsigned64 | new  |
| rxLenTypeFail         |         | read-only         | Unsigned64 | new  |
| rxGoodPause           |         | read-only         | Unsigned64 | new  |
| rxBadOpcodeCntlFrames |         | read-only         | Unsigned64 | new  |
| rxControlFrames       |         | read-only         | Unsigned64 | new  |
| txPauseFrames         |         | read-only         | Unsigned64 | new  |

**2.10.2.18 Name: nnGLinkOmIntervTable****2.10.2.18.1 Functional description**

The GigE Link OM Table contains Operational Measurements per Link, there is one entry per Link, 96 interval entries per Link.

See NORTEL-UEMG-GIGE-MIB for details. It can be found at <http://triweb/smg500/mibDir/mibList.html>.

**Table 40 Table size**

| Abbreviated table name | Minimum tuples | Maximum tuples | Information on memory                                                    |
|------------------------|----------------|----------------|--------------------------------------------------------------------------|
| nnGLinkOmIntervTable   | 8x96           | 8x96           | Memory is automatically allocated for 8 GigE interfaces by 96 intervals. |

**2.10.2.18.2 Fields/OIDs**

The following table lists fields/OIDs for nnGLinkOmCurrTable.

**Table 41 Table field descriptions**

| Field             | Default | Read/Write Access | Size       | Note |
|-------------------|---------|-------------------|------------|------|
| nnGLinkInterval   |         |                   |            |      |
| nnGLinkIntervESs  |         | read-only         | Unsigned32 |      |
| nnGLinkIntervSESs |         | read-only         | Unsigned32 |      |

**Table 41 Table field descriptions**

| <b>Field</b>          | <b>Default</b> | <b>Read/Write Access</b> | <b>Size</b> | <b>Note</b> |
|-----------------------|----------------|--------------------------|-------------|-------------|
| nnGLinkIntervUASs     |                | read-only                | Unsigned32  |             |
| nnGLinkIntervOPT      |                | read-only                | Unsigned32  |             |
| nnGLinkCurrOPR        |                | read-only                | Unsigned32  |             |
| nnGLinkintervTBC      |                | read-only                | Unsigned32  |             |
| nnGLinkintervVCC      |                | read-only                | Unsigned32  |             |
| nnGLinkIntervTEMP     |                | read-only                | Unsigned32  |             |
| txFifoOverruns        |                | read-only                | Unsigned64  | new         |
| txFifoUnderruns       |                | read-only                | Unsigned64  | new         |
| txBytesOverFlow       |                | read-only                | Unsigned32  | new         |
| txBytes               |                | read-only                | Unsigned64  | new         |
| rxFcsFail             |                | read-only                | Unsigned64  | new         |
| rxLenTypeFail         |                | read-only                | Unsigned64  | new         |
| rxGoodPause           |                | read-only                | Unsigned64  | new         |
| rxBadOpcodeCntlFrames |                | read-only                | Unsigned64  | new         |
| rxControlFrames       |                | read-only                | Unsigned64  | new         |
| txPauseFrames         |                | read-only                | Unsigned64  | new         |

## 2.11 Service Orders (SO) (CM & SESM)

Not Applicable

## 2.12 Software optionality control (SOC)

Not Applicable

## 2.13 Element Management

Detailed in the documentation for A00007000.

## 2.14 User interface changes

Detailed in the documentation for A00007000.

## 2.15 OSSGate Interface Changes

Not Applicable

## 2.16 Security

Not Applicable

## 2.17 Configuration Walkthrough

Detailed in the documentation for A00007000.

## *Performance for A00007074*

## 2.18 Performance management strategy

Performance for each of the GigE links will be monitored using OM counts. These counts will be provided through the OM collector.

## 2.19 Performance management tools and utilities

OM will be available from the EM and OM collector stream. Details of the EM can be found in the documentation for A00007000.

## 2.20 Performance Measurements (PM), Operational Measurements (OM), and stats

The following table indicates the OMs that will be collected, their correlation in the MIBs and the hardware register they are being pulled from.

### 2.20.1 PM, OM, and stats format

Table 13: OM collector table

| From Table               | Field                       | size      | Hardware counter |
|--------------------------|-----------------------------|-----------|------------------|
| <b>EtherHistoryEntry</b> | etherHistoryDropEvents      | Counter32 | rxFifoOverruns   |
| EtherHistoryEntry        | etherHistoryBroadcastPkts   | Counter32 | ?                |
| EtherHistoryEntry        | etherHistoryMulticastPkts   | Counter32 | ?                |
| EtherHistoryEntry        | etherHistoryCRCAAlignErrors | Counter32 | ?                |
| EtherHistoryEntry        | etherHistoryUndersizePkts   | Counter32 | rxUndersize      |
| EtherHistoryEntry        | etherHistoryOversizePkts    | Counter32 | rxOversize       |

|                                      |                                        |           |                       |
|--------------------------------------|----------------------------------------|-----------|-----------------------|
| <b>EtherHistoryEntry</b>             | etherHistoryFragments                  | Counter32 | rxFragmented          |
| <b>EtherHistoryHighCapacityEntry</b> | etherHistoryHighCapacityOverflowPkts   | Integer32 | rxFrames              |
| <b>EtherHistoryHighCapacityEntry</b> | etherHistoryHighCapacityPkts           | Integer64 | rxFrames              |
| <b>EtherHistoryHighCapacityEntry</b> | etherHistoryHighCapacityOverflowOctets | Integer32 | rxBytes               |
| <b>EtherHistoryHighCapacityEntry</b> | etherHistoryHighCapacityOctets         | Integer64 | rxBytes               |
| nnGLinkOmCurrerrTable                | txFifoOverruns                         | Integer32 | txFifoOverruns        |
| nnGLinkOmCurrerrTable                | txFifoUnderruns                        | Integer32 | txFifoUnderruns       |
| nnGLinkOmCurrerrTable                | txBytesOverflow                        | Integer32 | txBytesOverflow       |
| nnGLinkOmCurrerrTable                | txBytes                                | Integer64 | txBytes               |
| nnGLinkOmCurrerrTable                | rxFcsFail                              | Integer32 | rxFcsFail             |
| nnGLinkOmCurrerrTable                | rxLenTypeFail                          | Integer32 | rxLenTypeFail         |
| nnGLinkOmCurrerrTable                | rxGoodPause                            | Integer32 | rxGoodPause           |
| nnGLinkOmCurrerrTable                | rxBadOpcodeCntlFrames                  | Integer32 | rxBadOpcodeCntlFrames |
| nnGLinkOmCurrerrTable                | rxControlFrames                        | Integer32 | rxControlFrames       |
| nnGLinkOmCurrerrTable                | txPauseFrames                          | Integer32 | txPauseFrames         |

### 2.20.2 Performance File (CSV, SSV, XML) Format

Detailed in the documentation for the OM collector feature.

### 2.20.3 OM Group template (applies only to DMS)

Not Applicable

### 2.20.4 Register (applies only to DMS)

Not Applicable

## ***Product = MG 9000***

### **A00007107--Media Gateway 9000 5/30 Minute Operational Measurements**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

The OM collector currently collects OMs from different tables on a fixed 15 minute schedule. The MG9K stores the previous 96 15-minute interval data so it covers 24 hours of information. This feature changes the timing of these intervals to be configurable from the EM. The user can select any number of minutes as the standard interval. Also, the MG9K will be changed to store only 48 of blocks of interval data for non RFC-driven MIB tables. RFC-compliant tables will continue to have 96 blocks of intervals stored. The feature also provides for a second or extended OM interval. This extended interval is longer than the standard interval and is a time that is a multiple of the time in a standard interval. The data in the extended interval is computed based on the data for the appropriate number of standard intervals.

The new interval requirement does not apply to all OMs. It only applies to those that are collected by the OM collector. These tables are listed in the following table.

**Table 1 Impacted OM Tables**

| <b>OM Table</b>                 | <b>Subsystem</b> |
|---------------------------------|------------------|
| SNMP miscellanies               | SNMP             |
| nnPmSnmpOmIntervTable           | SNMP             |
| nnPmUtilOmIntervTable           | PerfMon          |
| nnPmOvldRscIntervTable          | PerfMon-Ovld     |
| nnPmOvldConnDenyIntervTable     | PerfMon-Ovld     |
| norCarrSonetMediumIntervalTable | Carrier-Sonet    |
| sonetSectionIntervalTable       | Carrier-Sonet    |
| sonetLineIntervalTable          | Carrier-Sonet    |
| sonetPathIntervalTable          | Carrier-Sonet    |
| apsChanStatusTable              | Carrier-Sonet    |
| imaGroupIntervalTable           | Carrier-IMA      |
| imaLinkIntervalTable            | Carrier-IMA      |

|                                       |           |
|---------------------------------------|-----------|
| nnClkSyncSignalTable                  | ClkSync   |
| nnClkSyncRefTable                     | ClkSync   |
| nnBwShelfCurrentSloaBandwResrvdTable  | Bandwidth |
| nnBwShelfIntervalSloaBandwResrvdTable | Bandwidth |
| nnBwAbiCurrentBandwResrvdTable        | Bandwidth |
| nnBwAbiIntervalBandwResrvdEntry       | Bandwidth |
| nnBwIntervalBandwUtilTable            | Bandwidth |
| nnBwIntervalQueueFillTable            | Bandwidth |
| nnMegacoOMDSPIntervalTable            | Megaco    |
| nnMegacoOMCESIntervalTable            | Megaco    |
| nnMegacoOMECHANIntervalTable          | Megaco    |
| nnMegacoOMMedGwyIntervalTable         | Megaco    |
| nnRelMsgSctpAssocOmIntervalTable      | SCTP      |
| nnMegacoQoSIntervalTable              | Megaco-IP |
| nnIpsecOmIntervalTable                | IpSec     |

A user can change the OM interval at any time. The most common usage is expected to be a change from 15 minute intervals to 5 minute intervals. If the user makes a change at 9:37 then at the next hour boundary (10:00), the historical data for OM intervals is flushed. The first interval with the new timing will be from 10:00 to 10:05. If the user also configures an extended interval of 30 minutes, then the first extended interval will be 10:00 to 10:30 and will just be a rollop of the six 5-minute intervals.

### 1.3 Hardware Requirements or Dependencies

There are no new hardware requirements for this feature.

### 1.4 Software Requirements or Dependencies

The only other software required for this feature is the regular SN08 version of the MG9K EM which contains the functionality to configure the OM intervals.

### 1.5 Limitations and restrictions

There are restrictions on the values that may be configured for the standard and extended intervals. Both intervals are specified in minutes and the extended interval must be evenly divisible by the standard interval. The minimum standard interval is 1 minute.

When the intervals are changed at the EM, the historical values for the previous 96 intervals are flushed from the MG9K. Also, the change to the new interval is not made until the hour boundary following the EM change. For example, if a user changes from 15 minute to 5 minute intervals at 9:37, the transition will be delayed until 10:00.



## 1.6 Interactions

### 1.7 Applicable customer facing sections

|                                    |                   |
|------------------------------------|-------------------|
| Functional Description (Mandatory) | <u>  X  </u>      |
| Fault Management                   |                   |
| Not applicable                     | <u>          </u> |
| Logs                               | <u>          </u> |
| Alarms                             | <u>          </u> |
| Configuration                      |                   |
| Not applicable                     | <u>          </u> |
| Data Schema/MIBs                   | <u>  X  </u>      |
| User Interface                     | <u>          </u> |
| GUI                                | <u>          </u> |
| Element Management                 | <u>  X  </u>      |
| Security                           | <u>          </u> |
| Service Order                      | <u>          </u> |
| Office Parameters                  | <u>          </u> |
| SOC                                | <u>          </u> |
| Upgrades impact                    | <u>          </u> |
| Accounting (includes AMA billing)  | <u>          </u> |
| Not Applicable                     | <u>          </u> |
| Billing changes                    | <u>          </u> |
| Performance                        | <u>          </u> |
| Not Applicable                     | <u>          </u> |
| Operational Measurements           | <u>  X  </u>      |
| Performance Measurements           | <u>          </u> |

## 1.8 Glossary

|      |                                                                     |
|------|---------------------------------------------------------------------|
| ABI  | Access Bridge Interface                                             |
| ATM  | Asynchronous Transfer Mode                                          |
| IP   | Internet Protocol                                                   |
| ITP  | Internet Telephony Processor                                        |
| MIB  | Management Information Base                                         |
| MG9K | Media Gateway 9000                                                  |
| NV   | Network View                                                        |
| OM   | Operational Measurement                                             |
| PM   | Performance Measurement (term used for OM's in Carrier Maintenance) |
| SCTP | Stream Control Transmission Protocol                                |
| SNMP | Simple Network Management Protocol                                  |

***Product = MG 9000***

## **A00007140A--Succession Upgrade Manager (Phase 1)**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

#### **1.2 Description**

This feature introduces a CLUI interface on the MG9k Element Manager to drive upgrades of the MG9k devices such as MTA, XDSL, DS1, ABI, ITP, ITX, SCO and SCI. This CLUI interface can be leveraged by IEMS so the upgrade of the MG9k devices can be driven from a centralized location.

The feature prevents the customer from making any provisioning changes during an MG9k upgrade. It also automates the patching of the devices after the upgrade completes.

The pre-download feature of the CLUI will be added as an enhancement to the existing upgrade GUI. The pre-download prepare phase separates the downloading of the card loads from the actual upgrade of the MG9k cards. The customer will now be able to download all cards outside of a maintenance window. Then once inside the maintenance window, the upgrade of the cards can be performed. Thus allowing the customer to utilize the on-site personnel's

time more effectively since they would not have to be on-site and wait for all of the cards to be downloaded.

This feature does not cover upgrade automation of single card replacement (i.e. load from mate). It does not cover node growth (i.e. card pair installation). It does not cover upgrade automation of a protection group. It does not provide a reset upgrade functionality nor a resume capability. It does not provide automatic image functionality.

### 1.3 Hardware Requirements or Dependencies

None

### 1.4 Software Requirements or Dependencies

None

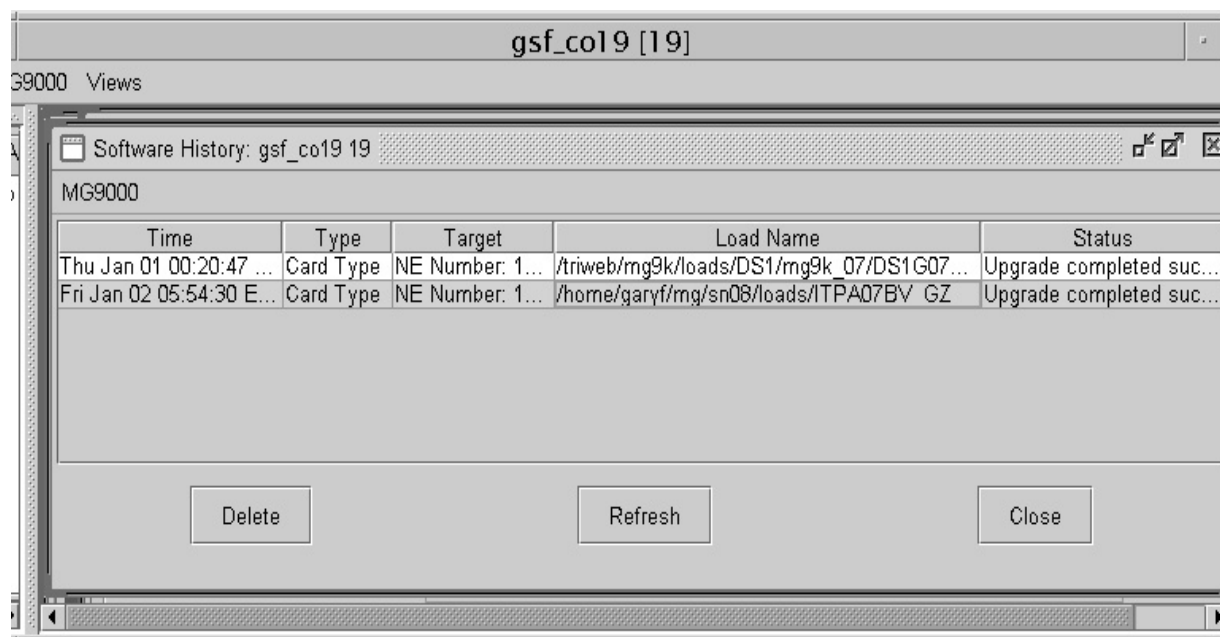
### 1.5 Limitations and restrictions

- 1 This version will not support multiple users. For example, a 10 node office would not be able to ask 2 crafts people to upgrade 5 nodes each at the same time. The second person will receive an error message.
- 2 This version will not support progress or status type messages back to the user during the execution of an *mg9kuptool* command. The user will need to create a new telnet session and issue a *mg9kuptool -query* command to obtain this type of information.
- 3 This design does not prevent two users from modifying the config data.
- 4 This design does not go to the SDM and give the user a list of loadnames to choose from. The customer has to enter the loadname manually.
- 5 We are not validating that the customer actually has put the patch files on NPM.
- 6 We are not validating that the NE alarms have been cleared as part of the prepare phase. NE alarms are checked in the precheck and upgrade phases since they could change between the prepare phase and the precheck phase.
- 7 A comparison between the NPM patchlist and the prepatched loads on the SDM are not performed in order to calculate the patch times. For example, if the NPM knows that an ITP card has 15 patches and the prepatched load contains 14 patches, the patching time is calculated based on 15 patches and therefore is a worst case estimate. This can be refined in a future release. With prepatched loads patching time should be considerably shorter.

- 8 The number of simultaneous NE upgrades is limited to four, to prevent overload of SDM.
- 9 The configuration data, created by the configure command, is used for the upgrade. If the GUI is used to prep download, the config command must be re-executed to ensure upgrading of the correct NE. GUI changes do not update the CLUI plan. They are separate interfaces.
- 10 When the user performs a prep download, the gateway will download the specified load -- even if the gateway already has that load.
- 11 After a successful prep download on a card, a normal download will download a new patched image (PI) only if the requested PI base loadname is different from the PI base loadname specified for the prep download. Note that patch content does not alter the PI base loadname.
- 12 If the customer creates a new image of a load that already exists on the gateway, the only way the customer can download the new load to the cards is to use the prep download functionality.
- 13 The validation performed prior to a prep download is the same as the validation performed prior to a regular download.
- 14 Prep download is not supported for card types MTA and XDSL.
- 15 The user cannot perform a prep download on an individual card basis. The user cannot perform a prep download on a protection group basis.
- 16 The mate load functionality on the MG9k gateway does not copy over prep download files.
- 17 The reset upgrade system functionality on the MG9k gateway, which should only be used as a last resort, may remove any prep download files. Therefore, the customer should check each card after performing a reset upgrade system request to ensure the prep download file required is shown in the Restart Flash Backup field on the card view in the Software Load area on the GUI. Anew prep download should be performed if the Restart Flash Backup field does not show the proper prep download loadname.
- 18 The *mg9kuptool* only provides support for a full node upgraded. It does not allow single cards to be upgraded. It does not allow protection group upgrades. And it does not allow load from mate.
- 19 If an upgrade fails, there is no retry mechanism in this release.

- 20 The customer does not receive any autonomous updates showing the upgrade status or patching status. The customer can query to find out where the upgrade/patching process is at. The customer can also look at the existing upgrade GUI and see the upgrade progress. We are not including patching progress in any GUI. The only way to see the patching status is to perform a query or look at the customer logs.
- 21 The abort command stops processing the card type which is upgrading. If other card types are already upgraded, they remain on the upgraded or downgraded load. This is the same as if the customer invoked the abort from the GUI.
- 22 Auto processes on the NPM are not automatically turned off nor automatically turned on. The customer must turn off auto processing at the NPM prior to upgrading. The precheck only alerts the customer to ensure auto processes are turned off in the NPM. The post check alerts the customer to manually check and turn auto processing on again.
- 23 The down load and upgrade times are only rough estimates generated by simple calculations using static timings collected from lab tests. To obtain more accurate estimates or progress status would require significant development effort in the Mg9K which is out of the scope of this release.
- 24 This feature does not allow patching of cards which have completed upgrading while other cards are upgrading. For example, if the ABI cards complete upgrades and the ITP cards are being upgraded, patching of the ABI cards is not started.
- 25 There is no indication to the customer showing which patches are already in the imaged load and which patches are going to be applied after upgrading is complete.
- 26 If the prepatched image contained an obsolete patch, NPM does not remove the patch. An NPM alarm indicating that there is an obsolete patch is raised and the customer can see the obsolete patch in the postcheck.
- 27 Prior to upgrading MTA or XDSL cards, the EM verifies that all the cards are in an unlocked/enabled state. If any card is not in the correct state, the EM will not perform the upgrade.
- 28 To upgrade MTA and XDSL cards, the EM will lock the card, download the load and then unlock the card. The order in which the EM upgrades XDSL cards cannot be specified as part of the upgrade.
- 29 If the upgrade of any MTA or XDSL card fails, the EM halts the upgrade process. If the lock or unlock of any card fails, the EM halts the upgrade process.

- 30** If an MTA or XDSL card already has the specified load file, the EM will consider the card already upgraded and move on to the next card to upgrade.
- 31** If the user aborts an upgrade while the EM is upgrading the XDSL cards, the EM will return all cards to an unlocked state. However, the EM will not roll back the loads on any of the cards. For instance, assume the user is upgrading all five XDSL cards on a given node. Assume the user aborts the upgrade after the first two cards have upgraded and a third card is in the process of upgrading. The EM halts the upgrade process after the third card completes its upgrade. In the end, three XDSL cards are running the new load and two XDSL cards are running the old load.
- 32** The “Software History” window does NOT display entries for MTA and XDSL card upgrades. The following figure shows an example of the “Software History” window.



- 33** The existing GUI will not allow the user to perform the specific phases that are defined in the CLUI.
- 34** The existing GUI will not allow the user to perform the following imbedded functions that are available in the CLUI:
- audit of flash data
  - autpatching

- 35** When the user attempts an upgrade, the GUI prints the following warning message:

Each card will download the specified load ONLY IF the specified load file does not already exist in the card's file system. If the card has the specified file, the gateway will NOT download the file -- even if the card's load has different patch content.

This warning applies to all upgrade types: nodal upgrade, card-type upgrade (excluding MTA and XDSL cards), card-specific upgrade (excluding MTA and XDSL cards) and protection group upgrade.

- Consider the following scenario:
  - The user creates a new patched image for the ITP card ITPA07BV\_GZ
  - The user attempts a card type upgrade and specifies load ITPA07BV\_GZ

Since the ITP cards already have this load, the user's upgrade will not change the load file on the ITP cards. Furthermore, the GUI will not warn the user that the request upgrade will not result in any changes.

## 1.6 Interactions

### 1.6.1 Existing GUI Upgrade Tool

Currently, the user of the MG9K EM GUI can initiate an upgrade from either the frame view or the card view:

- From the frame view, the user can select “Actions” and “Software Upgrade”. From this selection the user can perform a nodal upgrade to upgrade cards of various card types on a given node.
- From the card view of an upgradable card, the user can select “Actions” and “Software Upgrade”. From this selection the user can perform three types of upgrade: card only, protection group only, and single card type only.

This feature impacts the user interface for nodal upgrade only.

When the user selects “Actions” and “Software Upgrade” from the frame view, the user sees the “MG 9000 Software Upgrade Element” GUI. On this GUI, the user clicks “Configure” to set up an upgrade request. When the user clicks “Configure”, the GUI displays the “MG Upgrade Wizard”.

In SN08, the “MG Upgrade Wizard” has significant changes. First, the wizard asks the user if the EM should perform a “prep download” or a “complete upgrade”. The panel displaying this prompt is shown below.

**Figure 22 MG Upgrade Wizard - Card Type Selection**



When the user clicks “Next”, the “MG Upgrade Wizard” displays the “Card Type Selection” panel. This panel allows the user to choose the card types to upgrade. In addition to the existing choices such as “DS1”, “ITP”, “ITX”, and others, in SN08 the user can also choose “XDSL Cards” and “MTA Cards”. If the user selected “prep download” on the previous screen, the buttons for “XDSL Cards” and “MTA Cards” are disabled. (If the node being configured does not have any cards of a particular type, the Card Type Selection panel does not even display that card type as a choice.) The following figure shows the Card Type Selection Panel when the user has selected to upgrade a node that does not have any ABI cards and the user has selected to perform a “prep download” only.



**Figure 23 MG Upgrade Wizard - Card Type Selection**

MG Upgrade Wizard: garyf\_col9 19

Card Type Selection: Step 2 of many.

☐ All Applicable Card Types

A list of MG 9000 upgradeable card types is provided. Check the card types to upgrade, or check 'All Applicable Card Types' to upgrade all upgradeable card types in this MG 9000.

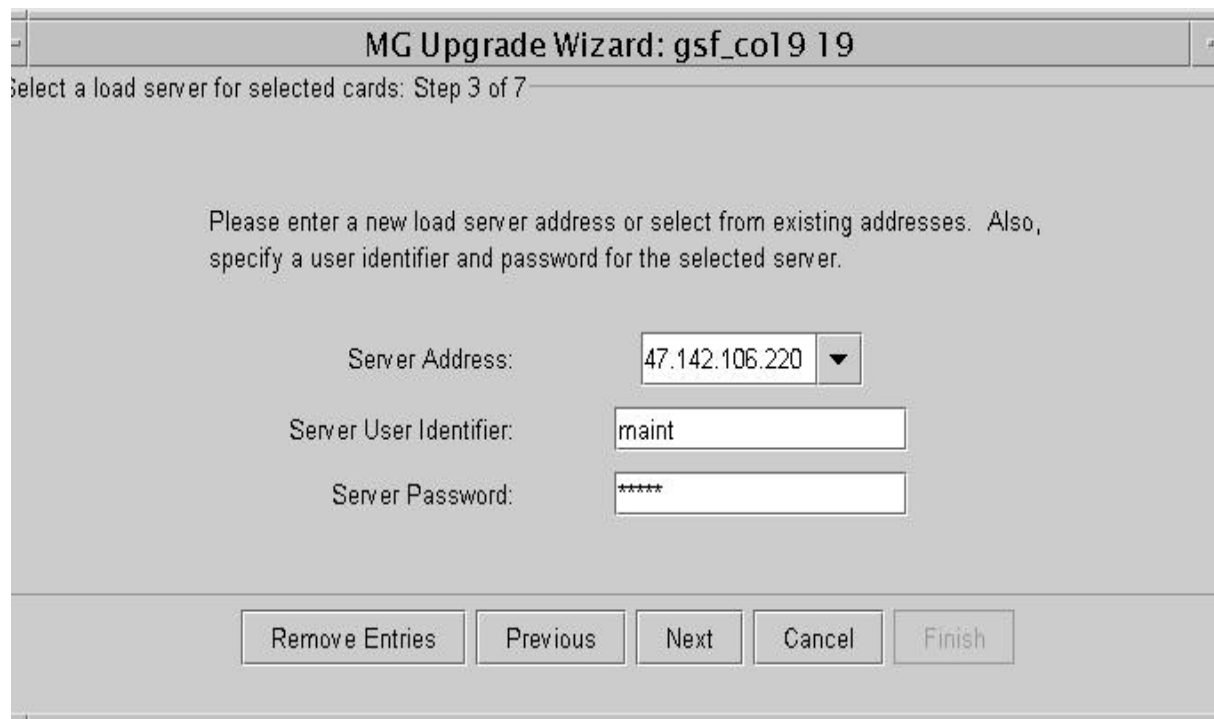
|                                     |                                              |
|-------------------------------------|----------------------------------------------|
| <input type="checkbox"/> XDSL Cards | <input type="checkbox"/> MTA Cards           |
| <input type="checkbox"/> DS1 Cards  | <input type="checkbox"/> ITP Cards           |
| <input type="checkbox"/> ITX Cards  | <input type="checkbox"/> Supercore OC3 Cards |

☒ Use one load server only.

Remove Entries Previous Next Cancel Finish

Once the user clicks “Next” on the “Card Type Selection” panel, the “MG Upgrade Wizard” prompts the user for the load information for each of the selected card types. The order in which the GUI gathers the load data for the different card types does not matter.

The prompts for the load information have not changed. Assuming the user selected “one load server” on the “Card Type Selection Panel”, the following two figures show the next two panels displayed by Upgrade Wizard.

**Figure 24 MG Upgrade Wizard: Load Server Selection**

MG Upgrade Wizard: gsf\_col 9 19

Select a load server for selected cards: Step 3 of 7

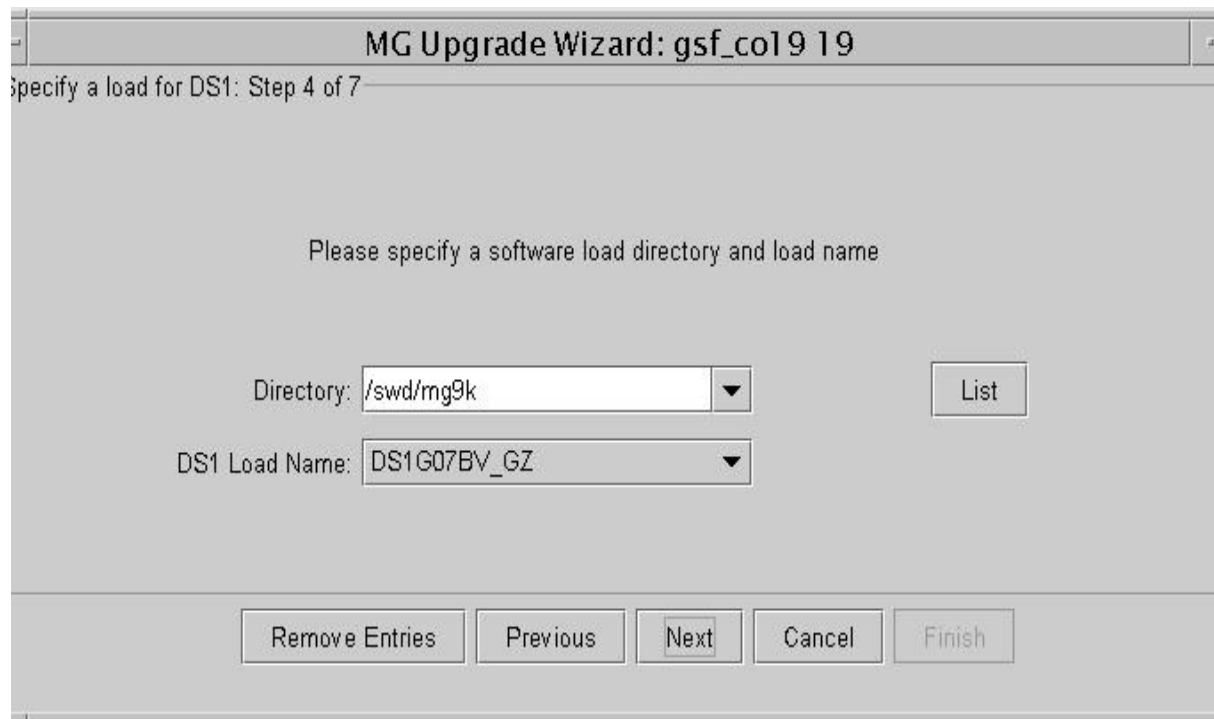
Please enter a new load server address or select from existing addresses. Also, specify a user identifier and password for the selected server.

Server Address: 47.142.106.220 ▼

Server User Identifier: maint

Server Password: \*\*\*\*\*

Remove Entries Previous Next Cancel Finish

**Figure 25 MG Upgrade Wizard: Load Name Selection for Card Type**

MG Upgrade Wizard: gsf\_col 9 19

Specify a load for DS1: Step 4 of 7

Please specify a software load directory and load name

Directory: /swd/mg9k ▼ List

DS1 Load Name: DS1G07BV\_GZ ▼

Remove Entries Previous Next Cancel Finish

Once the user has entered the load information for all of the selected card types, the user clicks “Finish” on the last panel. The “MG Upgrade Wizard” goes away and the GUI redisplay the “MG 9000 Software Upgrade Element” GUI with the settings the user has entered. Field “Upgrade Type” indicates if the user selected a “prep download” or a “complete upgrade”. The subsection “Upgrade Type Data” contains a tab for each selected card type. The user can click the tabs to see the load information for each card type. Finally, the user can click the “Upgrade” button at the bottom of the screen to start the upgrade. The following figure shows the top portion of the “MG 9000 Software Upgrade Element” GUI.

**Figure 26 MG 9000 Software Upgrade Element**

The screenshot displays the "MG 9000 Software Upgrade Element: 19" GUI. The window title is "gsf\_co19 [19]". The main content area is divided into several sections:

- Upgrade Originator:**
  - MG 9000 Name: gsf\_co19 19
  - Originating View: MG9000 Element 19
- Upgrade State:**
  - Upgrade Status: Configure step completed.
  - Upgrade Action: Configure
  - Upgrade Type: Card Type -- prep download only!
- Upgrade Type Data:**
  - Upgrading: DS1 Card Type
  - DS1 | ITP | ITX | Supercore OC3 (selected)
  - Load Server: 47.142.106.220
  - Load Server User Id: maint
  - Load: /swd/mg9k/DS1G07BV\_GZ
- Upgrade Instructions & Results:**
  - performing abort

## 1.6.2 CLI Interface

Command Syntax:

`mg9kuptool <option> <-n NE_number_list>`

| Command Options | Description                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -configure      | This option provides the configuration of the upgrade tool. This includes the list of NEs to upgrade, the name and location of the card loads, etc.                                                                                                                                                                                                                                              |
| -prepare        | This option is largely informative to allow the user to determine if they are prepared to upgrade the system. It is executed for each node in the target node list <-n>.                                                                                                                                                                                                                         |
| -precheck       | This option reviews the overall system health of each node defined in the target node list <-n> in preparation for the upgrade. Any problems discovered are returned so that action can be taken to correct the issue before the upgrade begins.                                                                                                                                                 |
| -download       | This option down loads the card loads as defined in the upgrade plan. It is executed for each node in the target node list <-n>.                                                                                                                                                                                                                                                                 |
| -upgrade        | This option executes the actual upgrade process defined in the upgrade plan. It is executed for each node in the target node list <-n>. This may include the down loading of card loads if that was not executed earlier as a separate step.<br><br>When the upgrade is complete all available patches will be applied. If patches are applied, a new image of the patched load will be created. |
| -postcheck      | This option checks to see if any alarms were raised, asks the customer to run any test calls or test scripts and reports any patches that were not applied. It is executed for each node in the target node list <-n>.                                                                                                                                                                           |
| -query          | This option provides status information regarding the upgrade process for each node in the target node list <-n>.                                                                                                                                                                                                                                                                                |
| -abort          | This option terminates the upgrade step being executed for each node in the target node list <-n>.                                                                                                                                                                                                                                                                                               |
| -n              | This option describes the list of nodes on which to apply the operation. This is a comma separated list of numbers. If the list is specified as '*' then the operations is applied to all nodes in the plan. This option may be used on all commands except <configure>.                                                                                                                         |

### 1.6.2.1 CLI - Interactive Mode No Options

Issuing the *mg9kuptool* command without options will result in an interactive conversation with the user to determine which command option to process.

`mg9kuptool`

```
1 configure
2 prepare
3 precheck
4 download
5 upgrade
6 postcheck
7 abort
8 query
x exit
```

Please select an option:

### 1.6.2.2 CLI - Interactive Mode configure Option

Issuing the *mg9kuptool -configure* command or selecting this option from the interactive list will bring up the following dialog:

NOTE: All input is case sensitive.

In which directory on the imaging server do the loads reside?

/swd/mg9k

Enter MTA loadname:

MTAG07EJ\_1\_GZ

Enter XDSL loadname:

DSLA06\_2EI

Enter DS1 loadname:

DS1G08BV\_GZ.tar

Enter ABI loadname:

ABIG08BV\_GZ.tar

Enter ITP loadname:

ITPA08BV\_GZ.tar

Enter ITX loadname:

ITXA08BV\_GZ.tar

Enter SCO loadname:

SCOA08BV\_GZ.tar

Enter SCI loadname:

SCIA08BV\_GZ.tar

Verifying loads on SDM.....

Loads valid.

Which NE(s) do you want to upgrade/downgrade? Enter NE number. If more than 1 NE separate with commas (e.g. 8,9):

8

Plan name is /data/mg9kem/persistdata/MG9kUpgradePlan.dat

### 1.6.2.3 CLI - Interactive Mode prepare Option

Issuing the *mg9kuptool -prepare* command or selecting this option from the interactive list will bring up the following dialog:

Have you put the patch files on the NPM? Y/N

Y

Upgrading to loads:

/swd/mg9k/MTAG07EJ\_1\_GZ

/swd/mg9k/DSLA06\_2EI

/swd/mg9k/DS1G08BV\_GZ.tar

patchlist:

none

/swd/mg9k/ABIG08BV\_GZ.tar

patchlist:

AMZ005

/swd/mg9k/ITPA08BV\_GZ.tar

patchlist:

AMZ006

HDD013

HDD014

HDD015

```
/swd/mg9k/ITXA08BV_GZ.tar
```

```
patchlist:
```

```
none
```

```
/swd/mg9k/SCOA08BV_GZ.tar
```

```
patchlist:
```

```
AMZ007
```

```
AMZ008
```

```
HDD016
```

```
/swd/mg9k/SCIA08BV_GZ.tar
```

```
patchlist:
```

```
AMZ008
```

Please compare the patchlists above against the Nortel web page.

NE# 8: time to download is 1 hour

time to upgrade is 1.5 hours

time to patch is 27 minutes

#### 1.6.2.4 CLI - Interactive Mode precheck Option

Issuing the *mg9kuptool -precheck* command or selecting this option from the interactive list will bring up the following dialog:

- Enter the node number or node number list for the precheck request:  
<the displayed default is the list of all NEs in the plan>

#### 1.6.2.5 CLI - Interactive Mode download Option

Issuing the *mg9kuptool -download* command or selecting this option from the interactive list will bring up the following dialog:

- Enter the node number or node number list for the download request:  
<the displayed default is the list of all NEs in the plan>

#### 1.6.2.6 CLI - Interactive Mode upgrade Option

Issuing the *mg9kuptool -upgrade* command or selecting this option from the interactive list will bring up the following dialog:

This process will affect DSL traffic and should be performed during a maintenance window only.

- Enter the node number or node number list for the upgrade request:

<the displayed default is the list of all NEs in the plan>

### 1.6.2.7 CLI - Interactive Mode postcheck Option

Issuing the *mg9kuptool -postcheck* command or selecting this option from the interactive list will bring up the following dialog:

- Enter the node number or node number list for the postcheck request:

<the displayed default is the list of all NEs in the plan>

### 1.6.2.8 CLI - Interactive Mode abort Option

Issuing the *mg9kuptool -abort* command or selecting this option from the interactive list will bring up the following dialog:

- Enter the node number or node number list for the abort request:

<the displayed default is the list of all NEs in the plan>

### 1.6.2.9 CLI - Interactive Mode query Option

Issuing the *mg9kuptool -query* command or selecting this option from the interactive list will bring up the following dialog:

- Enter the node number or node number list for the query request:

<the displayed default is the list of all NEs in the plan>

## 1.6.3 Customer Logs

Customer logs will be created each time the *mg9kuptool* is executed. A new NT standard log number will be defined as follows:

- MGEM714

### 1.6.3.1 Format

Here is an example of the new MGEM 714 log:

- Aug 18 15:07:28 apex-unit0 MGEM: 714 Executing mg9kuptool command precheck

### 1.6.3.2 Field descriptions

| Field            | Description                       | Example         |
|------------------|-----------------------------------|-----------------|
| Date/Time        | Date and time stamp of the log    | Aug 18 15:07:28 |
| Host Name        | Host machine name                 | apex-unit0      |
| Application Name | The application producing the log | MGEM            |
| Log Number       | The log number                    | 714             |



| Field    | Description            | Example                                     |
|----------|------------------------|---------------------------------------------|
| Log Text | The action being taken | Executing<br>mg9kuptool<br>command precheck |

## 1.7 Glossary

| Term | Description                       |
|------|-----------------------------------|
| CLI  | Command Line Interface            |
| CLUI | Command Line User Interface       |
| EM   | Element Manager                   |
| GUI  | Graphical User Interface          |
| IEMS | Integrated Element Manager System |
| MG9K | Media Gateway 9000                |
| MR   | Maintenance Release               |
| NE   | Network Element                   |
| NPM  | Network Patch Manager             |
| SDM  | Succession Data Manger            |





# SN08 Feature Deltas

***Product = MG 9000***

## **A00007140B--Upgrade Manager Phase 1 - GWC and SC parts** ***Functional Description***

### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

### **1.2 Description**

As of SN08, Succession CallServer subnetwork upgrades have been performed using a purely manual process which has required a significant amount of human power to orchestrate. Also, the upgrade technician has been forced to navigate hundreds of pages of documentation in order to successfully plan and complete the end-to-end system upgrade. As a result, Succession CallServer subnetwork upgrades have been extremely difficult to manage and have been a constant source of concern/dissatisfaction with Nortel customers.

The SN08 Succession Upgrade Manager delivers:

- a robust SC upgrade tool.
- a robust GWC upgrade tool.
- a robust MG9K upgrade tool. (This FN covers only the GWC and SC upgrade tools. The MG9K is in another document.)

The SC and GWC upgrade tools serve as the underlying per-network element tools for the end architecture. The intent for SN08 is to focus as much effort as required to make these underlying tools as robust and complete as possible.

As part of the SN08 Succession upgrade tools, the SC and GWC upgrade tools both provide a pure CLI for the customer or upper-level coordinator to invoke upgrade functionalities. In addition, an interactive CLUI is also provided to customers for easy use of the tool. The following content will give a detailed description on SC and GWC.

### 1.2.1 Internally used options

SC and GWC upgrade tools are designed to work with the upper level MOP automation tool. So there are some internally used options which will not appear in the customer documentation.

## 1.3 Deployment

Basically the GWC and SC upgrade tools will be packaged within the GWC and SC element manager servers.

### 1.3.1 SC upgrade tool

The tool will be part of the NTsam21em package, when the SAM21EM is configured and running properly, the SC upgrade tool is ready to use.

In the SSPFS running environment, the SC upgrade tool is located in:

- `/opt/nortel/sam21em/bin/scuptool.sh` -- Program entry
- `/opt/nortel/sam21em/classes` -- Jar files

### 1.3.2 GWC upgrade tool

The GWC uptool will be part of the NTsesm package, and it is located in:

- `/opt/nortel/NTsesm/gwcuptool` -- Base directory
- `/opt/nortel/NTsesm/gwcuptool/bin` -- All scripts
- `/opt/nortel/NTsesm/gwcuptool/jars` -- Jar files
- `/opt/nortel/NTsesm/gwcuptool/bin/gwcuptool.sh` -- Program entry

If you want to use the GWC upgrade tool the following applications must be configured and running properly:

- SAM21EM is running.
- SESM Service is running.
- NPM/PSE is configured properly.

### 1.3.3 Running restriction

Users must belong to one of these groups “mgcmte, mgcadm, emsmte, emsadm”, who have permission to run the upgrade tools.

## 1.4 GWC Upgrade Tool

In SN08, GWC will provide a basic CLI interface and an interactive CLUI that is based on the basic CLI interface.

The GWC upgrade tool provides the basic functions that GWC upgrading needs. They are:

- Start the GWC upgrade manager server prior to client launching.
- Configure the upgrade options before the actual upgrade.

- Prepare the necessary steps for getting the tool and system ready prior to the actual upgrade.
- Pre-check the relevant EM and configured GWC states including alarms.
- Upgrade the configured GWC with configured options.
- Post-check the upgraded GWC states including alarms.
- Query the GWC upgrade states in progress.
- Query the GWC information and list them by profile types.
- Query the configurations currently used.
- Stop the upgrade manager server.
- The help facility provided with the functions.

All these functions are provided by a shell named ***gwcuptool.sh***. The end user should run the corresponding commands in an order which is given in the appendices. The order ensures you encounter, as little as possible, any warnings and errors. The order is mandatory.

#### 1.4.1 Restriction for GWC upgrade

Because the GWC upgrade tool needs SESM, SAM21EM, and NPM to execute the real device operations, while the GWC upgrade is in progress, the following functions will be disabled to prevent any unexpected problems:

- All provisioning actions in SESM.
- All (CS2k/V5.2/Trunk/Line) Data Integrity Audits.
- GWC auto imaging in GWCEM.
- GWC auto patching in NPM.

When the upgrade is finished, provisioning functions will be enabled automatically by the GWC upgrade tool.

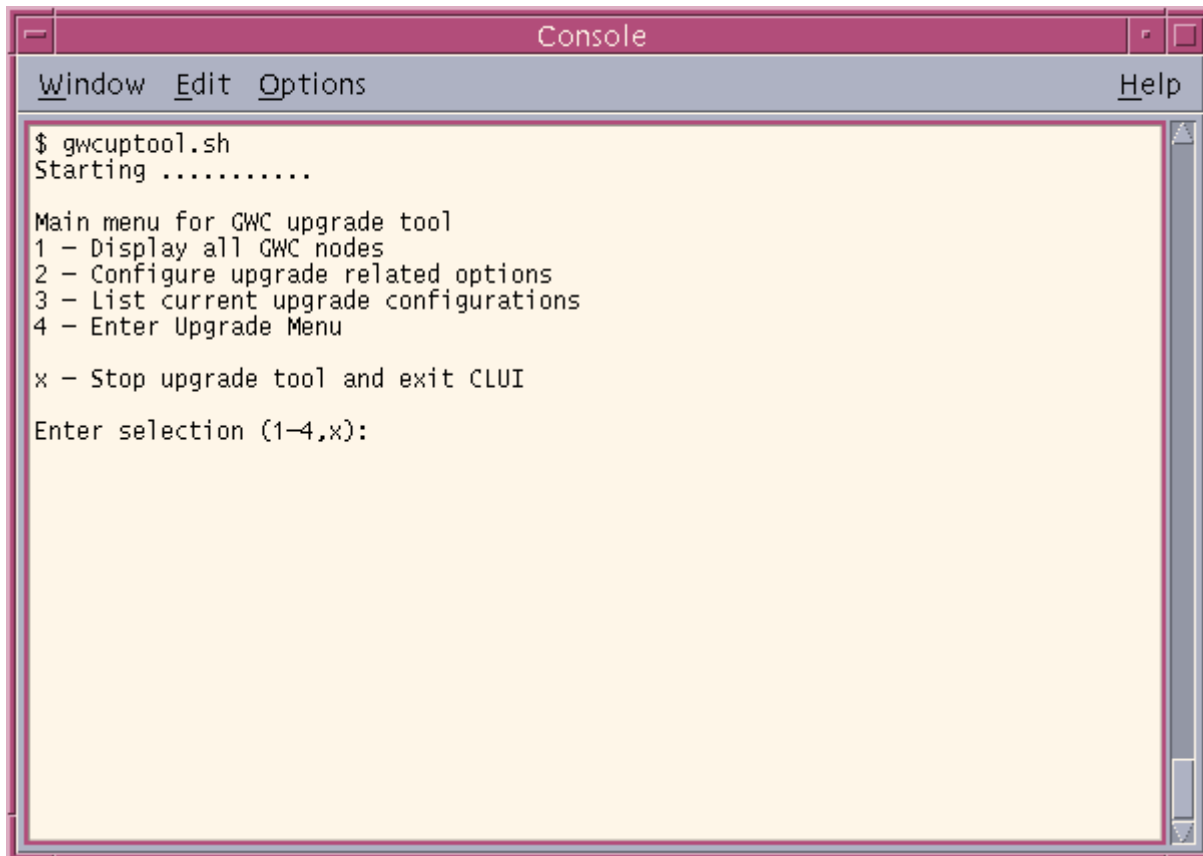
Before using this tool, the end user must make sure that PSE in the same SSPFS is configured properly.

When the user/password is required, the end user must make sure that the login user belongs to one of these groups “mgcmte, mgcadm, emsmte, emsadm”. Otherwise, the operation is denied.

#### 1.4.2 Interactive CLUI

The interactive CLUI is a shell that wraps basic CLI. It provides a “restricted” tool to achieve the upgrade goal.

Issue “gwcuptool.sh” to launch the GWC upgrade tool CLUI. The main menu is as follows:



```
$ gwcuptool.sh
Starting .....

Main menu for GWC upgrade tool
1 - Display all GWC nodes
2 - Configure upgrade related options
3 - List current upgrade configurations
4 - Enter Upgrade Menu

x - Stop upgrade tool and exit CLUI

Enter selection (1-4,x):
```

There are a total of five selections in the main menu. There are:

**1 Display all GWC nodes**

This selection queries all GWC nodes information, including name, ip and state.

**2 Configure upgrade related options**

This selection configures upgrade options manually. CLUI will prompt the end user to input necessary information step by step. These options are effective in the whole upgrade process.

**3 List current upgrade configurations**

This selection lists all options currently used.

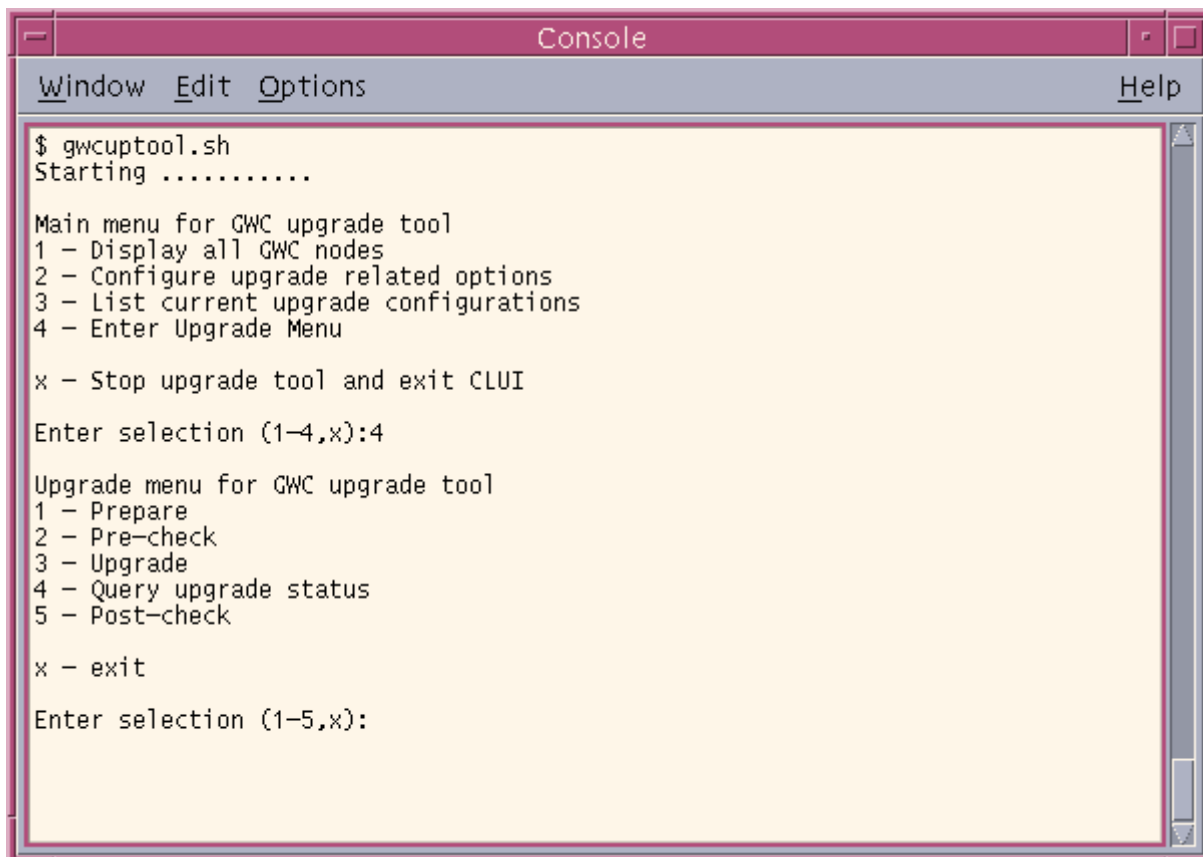
**4 Enter upgrade menu**

This selection enters the upgrade submenu.

**5 Stop upgrade tool and exit CLUI**

This selection stops the GWC upgrade tool and exits CLUI.

When selection 4 is selected, the end user will enter the upgrade submenu to do the real upgrade process. The following figure illustrates the upgrade submenu:



```
Console
Window Edit Options Help
$ gwcuptool.sh
Starting .....

Main menu for GWC upgrade tool
1 - Display all GWC nodes
2 - Configure upgrade related options
3 - List current upgrade configurations
4 - Enter Upgrade Menu

x - Stop upgrade tool and exit CLUI

Enter selection (1-4,x):4

Upgrade menu for GWC upgrade tool
1 - Prepare
2 - Pre-check
3 - Upgrade
4 - Query upgrade status
5 - Post-check

x - exit

Enter selection (1-5,x):
```

There are a total of six selections in the upgrade submenu. All these selections are based on the options configured in the main menu.

- **Prepare**

This selection is the preparation prior to the actual upgrade.

- **Pre-check**

This selection does the pre-check prior to the actual upgrade.

- **Upgrade**

This selection does the real upgrade.

- **Query upgrade status**

This selection queries the upgrade status.

- **Post-check**

This selection does the post-check after the actual upgrade.

- **exit**

This selection exits the upgrade submenu and enters the main menu.

### 1.4.3 Basic CLI

Corresponding functions to the above are achieved using the `gwcuptool.sh` command. The details are as follows.

#### 1.4.3.1 Start GWC upgrade manager server prior to client launching.

```
gwcuptool.sh -start [-gwcem ip:port] [-sam21em ip:port] [-sid sid]
```

Command description:

Start the GWC upgrade tool server, in order to do the following actions:

- 1 Request the end user to input a user name/password if not applying the session ID in the command.
- 2 Connect to GWCEM / SAM21EM through CORBA.
- 3 Check whether this user has permission to perform the upgrade operations.

Options:

[1] -gwcem

**Requirement:** Internally used options.

**Description:** Provides CORBA server ip and the port GWCEM server registered.

**Default:** localhost:2001

[2] -sam21em

**Requirement:** Internally used options.

**Description:** Provides CORBA server ip and the port SAM21EM server registered.

**Default:** localhost:2001

[3] -sid

**Requirement:** Internally used options.

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
gwcuptool.sh -start
```

If the end user only issues “`gwcuptool.sh -start`”, only the user who belongs to one of “`mgcmte`, `mgcadm`, `emsmte`, `emssadm`” groups, can run the tool.



### 1.4.3.2 Configure upgrade options before actual upgrade.

```
gwcuptool.sh -config [-n <GWC list>] [-o [value]] ...
```

Command description:

Configure the upgrade options. These options are useful to upgrade, pre-check, post-check and query commands.

Note:

- 1 All configurations' default value will be stored in a property file on the upgrade manager server machine. We do not support customers who modify it themselves.
- 2 When only “gwcuptool.sh -config -list” is issued, the upgrade manager server will return all current configurations. Its functionality is query configuration.
- 3 If the end user only issues “gwcuptool.sh -config”, the shell will prompt the end user to input necessary information step by step.
- 4 When the second configuration command is issued, all prior configurations will be replaced.

The options are as follows:

[1] -pa load\_directory\_name

**Requirement:** Optional

**Description:** Specify the load file path in SDM/CBM. If no directory name is applied, the default directory '/swd/gwc/' will be used.

**Default:** “/swd/gwc/”

**Example:**

```
-pa /swd/gwc/
```

[2] -f new\_load\_file\_name

**Requirement:** Mandatory

**Description:** Target load file name. The user must specify a load file name here. Otherwise, the config function will return an error message.

**Default:** "".

**Example:**

```
-f gn080ak.imag
```

[3] -l new\_load\_name

**Requirement:** Optional

**Description:** Target the load name of the given GWC load file. The new load name will be used to query the patch list from NPM. If the file name does not contain the GWC load name, the end user MUST specify a valid GWC load name here.

**Default:** new load file name except “.imag”

**Example:**

```
-l GN080AK
```

```
[4] -o old_load_name
```

**Requirement:** Optional

**Description:** The load upgrade from. If the end user ignores it, the upgrade manager server will bypass the old load checking. By default users do not need to specify the old load name, and all selected GWC nodes will be upgraded automatically.

**Default:** "".

**Example:**

```
-o GN070BK
```

```
[5] -m <single | bulk | mix>
```

**Requirement:** Optional

**Description:** Upgrade mode

- Single: all GWC nodes will be upgraded one by one ordered by the GWC profile type and GWC ID.
- Bulk: All GWC nodes within the same service group (e.g. TRUNK, LINE) will be upgraded at the same time. If patching is needed, the first selected “seed” GWC node which is used to create the soak image will use single mode and the others that do not need patching will use bulk mode.
- Mix: In the same GWC profile group (e.g. TRUNK GWCs, Line GWCs), one GWC node will be upgraded first. (Purpose: the end user can do verification on the specified type of GWC.) After it is upgraded successfully, all other GWC nodes within the same profile group will be upgraded at the same time.

See “Appendix 3: Upgrade mode examples in GWC upgrade tool” on page 2200.

**Default:** bulk.

**Example:**

```
-m bulk
```

```
[6] -p [0,1,2,3,4,5,6]
```

**Requirement:** Optional

**Description:** Upgrade pause points. If the end user does not provide this option, no pause points are done during upgrading.

The following shows what the number means:

- For the first GWC node within the same GWC group:
  - 1 - before lock the first upgrade unit of the “seed” node.
  - 2 - after patch applied to the “seed” unit.
  - 3 - before warm-swact.

- 4 - after “seed” node upgraded.
- 5 - pause on all the above conditions.

- For bulk upgrade GWC nodes with the same GWC profile type:  
6, before warm-swact.

**Default:** 0, without any pause points.

**Example:**

```
-p '1,3,4'
```

The example option means the upgrade will pause on conditions 1,3, 4.

```
[7] -d [VRB | MAJ | MNR | CRT ]
```

**Requirement:** Optional

**Description:** Define logging level for the upgrade log file.

VER: Logging verbose information.

MAJ: Logging major information.

MNR: Logging minor information.

CRT: Logging critical information.

**Default:** MAJ.

**Example:**

```
-d MNR
```

```
[8] -s
```

**Requirement:** Optional. Internally used by the designer.

**Description:** Skip patching because the given load is soaked. Do not apply patches on the new GWC load.

**Example:**

```
-s
```

```
[9] -n <GWC list>
```

**Description:** Define the GWC list that should be upgraded. It will be the default GWC list for pre-check, upgrade, post-check and query commands.

**Default:** all

**Example:**

```
-n 'GWC-1,GWC-2,GWC-3,GWC-5'
```

```
[10] -t <mins>
```

**Description:** Define a time limitation for doing the upgrade. If the upgrade cannot complete all nodes within the given time slot, the un-upgraded GWC nodes will be kept there. The upgrade will finish. If “0” is specified as the time limitation, the limitation check will be disabled.

**Default:** 0

**Example:**

```
-t 180
```

Note: The time begins when the “gwcuptool.sh -up” command is executed. A second “gwcuptool.sh -up” command does not reset the time slot.

[11] -np <max parallel number>

**Requirement:** Optional. Internally used by the designer.

**Description:** Max parallel number during the bulk upgrade.

**Default:** 32

Example:

-np 16

[12] -a [CRT | MAJ] -an [number]

**Requirement:** Optional.

**Description:** The allowed highest alarm level during the upgrade, and the allowed max alarm number during the upgrade. It is a dynamic alarm checking values. If the current alarm state has higher priority than is defined here, the upgrade program will be paused and the end user is notified of this.

For examples, if we specify “-a MAJ -an 2” in config step:

- If there are 3 MAJ alarms raised in the EM Server for this node, the upgrade tool will be paused
- If there is 1 MAJ alarm raised in the EM Servers for this node, the upgrade tool will ignore it and continue the upgrade process.
- If there is 1 CRT alarm raised in the EM Server for this node, the upgrade tool will be paused too because the CRT has high priority than the MAJ alarms.

**Default:** MAJ 2

Example:

-a CRT -an 2

[13] -sid sid

**Requirement:** Optional, internally used by the MOP automation tool,

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide valid session ID to avoid re-login. The end user need not input this option. This option is not a part of the configuration

**Default:** 0

Example:

```
gwcuptool.sh -config -f gn080ak.imag -sid
312308CDA87F5C7ECD3185F639892BC2
```

An example of a whole command format:

```
gwcuptool.sh -config -f gn080ak.imag -o GN070BV -m bulk -p '1,3,4' -d CRT -n 'GWC-1'
-t 120 -a CRT -an 4 -sid 312308CDA87F5C7ECD3185F639892BC2
```

### 1.4.3.3 Prepare necessary steps for getting the tool and system ready prior to the actual upgrade.

```
gwcuptool.sh -prep [-sid sid]
```

Command description:

Shows the end user the necessary preparations that include upgrade steps and order, notes and warnings.

The following actions should be checked in the prepare command:

- 1 Check the load available in SDM/CBM.
- 2 Get the patch list from NPM, display the patch list to the end user, and ask the end user to confirm:
  - The name is based on the load name specified in the “-config” step, by default the load file name will be used as the load name.
  - The GWC Upgrade tool will use the load name to query the list of patches that NPM knows about.
  - The list of patches will be presented to the user.
  - Prompt the user to tell them that they need to go to the Nortel web site and verify that the list they have is the list that they should have. Also make them type “Y”/”yes” to confirm that they have verified this before we allow the preparation to succeed.
- 3 Display the upgrade plan for the GWC.
- 4 Calculate the estimated time of the upgrade.

Options:

[1] -sid sid

**Requirement:** Optional, internally used by the MOP automation tool.

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option. This option is not part of the configuration

**Default:** 0

**Example:**

```
gwcuptool.sh -prep -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.4 Pre-check relevant EM and configured GWC states including alarms.

```
gwcuptool.sh -precheck [-n <GWC List>] [-sid sid]
```

Command description:

Pre-check the necessary conditions before the upgrade.

If there is no given GWC list, the configured GWC list will be used instead. Perform the following actions:

- 1 GWCEM, SAM21EM and NPM server status.
- 2 Load is available on the load server. (Get from SAM21EM server.)
- 3 Alarm status.
- 4 Hardware level health check. If the node has two physical units, check both of them are in service.
- 5 Software level health check. The inactive unit is in hot-standby.

[1] -n <GWC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** GWC nodes that should be upgraded. If there is no given GWC list, the configured GWC list will be used instead.

[2] -sid sid

**Requirement:** Optional, internally used by the MOP automation tool,

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
gwcuptool -precheck -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.5 Upgrade configured GWC with configured options.

```
gwcuptool.sh -up [-n <GWC list>] [-sid sid]
```

Command description:

Does the real upgrade work? Still perform the pre-check / post-check using this command. During the upgrade the client side will display the logs sent from the server side. The client side may need to answer some questions or do some confirmation for different conditions. If the end user enabled break points, this tool will work in interactive mode.

When the “seed” GWC node’s inactive unit is patched, the GWC upgrade tool will invoke the function provided by NPM to query the patch applying status. The status is displayed to the end user.

[1] -n <GWC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** GWC nodes that should be upgraded. If there is no GWC list, the configured GWC list will be used instead.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
gwcuptool.sh -up -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.6 Post-check upgraded GWC states including alarms.

```
gwcuptool.sh -postcheck [ -n <GWC list> ] [-sid sid]
```

Command description:

Do the post-check for the given GWC nodes.

If there is no GWC list, the configured GWC list will be used instead.  
The following status will be checked:

- Application status from GWCEM.
- Alarm state
- Query the patch applied status from NPM

[1] -n <GWC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** GWC nodes which should be upgraded. If there is no GWC list, the configured GWC list will be used instead.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
gwcuptool.sh -postcheck -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.7 Query upgrade states in progress.

```
gwcuptool.sh -query [ -n <GWC list> ] [-sid sid]
```

Command description:

Query the status of the GWC units and upgrade status.

The status includes two parts. If there is no upgrading GWC, no part A status exists.

If there is no GWC list, the configured GWC list will be used instead.

- Upgrade status report.

Report includes following items:

- GWC-ID: e.g. GWC-3
- Current upgrade step: e.g. SWACT (7 / 12)
- Spent time: e.g. 10 minutes
- Time left: e.g. about 13 minutes.

- B. Unit status report

Report items.

- GWC Unit name: GWCUnit IP
- GWC type and profile.
- GWC load information. Upgraded or not.
- Status from GWCEM
- Status from SAM21EM

[1] -n <GWC List>

**Requirement:** Optional

**Description:** Only the specified GWC node status will be shown.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool.

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
gwcuptool.sh -query -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.8 Query GWC information and list them by profile types.

```
gwcuptool.sh -query -n all [-sid sid]
```

Command description:

Query all GWC information including name, ip and state.



This command reuses “gwcuptool.sh -query” interface, it can list all GWCs’ information and show them by profile types.

Example:

```
gwcuptool.sh -query -n all -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.9 Query configurations currently used.

```
gwcuptool.sh -config -list [-sid sid]
```

Command description:

Query current configurations. It reuses the “gwcuptool.sh -config” interface.

Example:

```
gwcuptool.sh -config -list -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.10 Stop upgrade manager server.

```
gwcuptool.sh -stop [-sid sid]
```

Command description:

Stop upgrade server.

Options:

[1] -sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

Example:

```
gwcuptool.sh -stop -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.4.3.11 Help facilities of the functions.

```
gwcuptool.sh -start -h  
gwcuptool.sh -config -h  
gwcuptool.sh -prep -h  
gwcuptool.sh -precheck -h  
gwcuptool.sh -up -h  
gwcuptool.sh -postcheck -h
```

```
gwcuptool.sh -query -h
```

```
gwcuptool.sh -stop -h
```

Command description:

Shows the end user the help facilities of the functions. It includes function description, option meaning and usage.

How to use the above separate commands to achieve a complete upgrade task. Appendix 1 gives you an example.

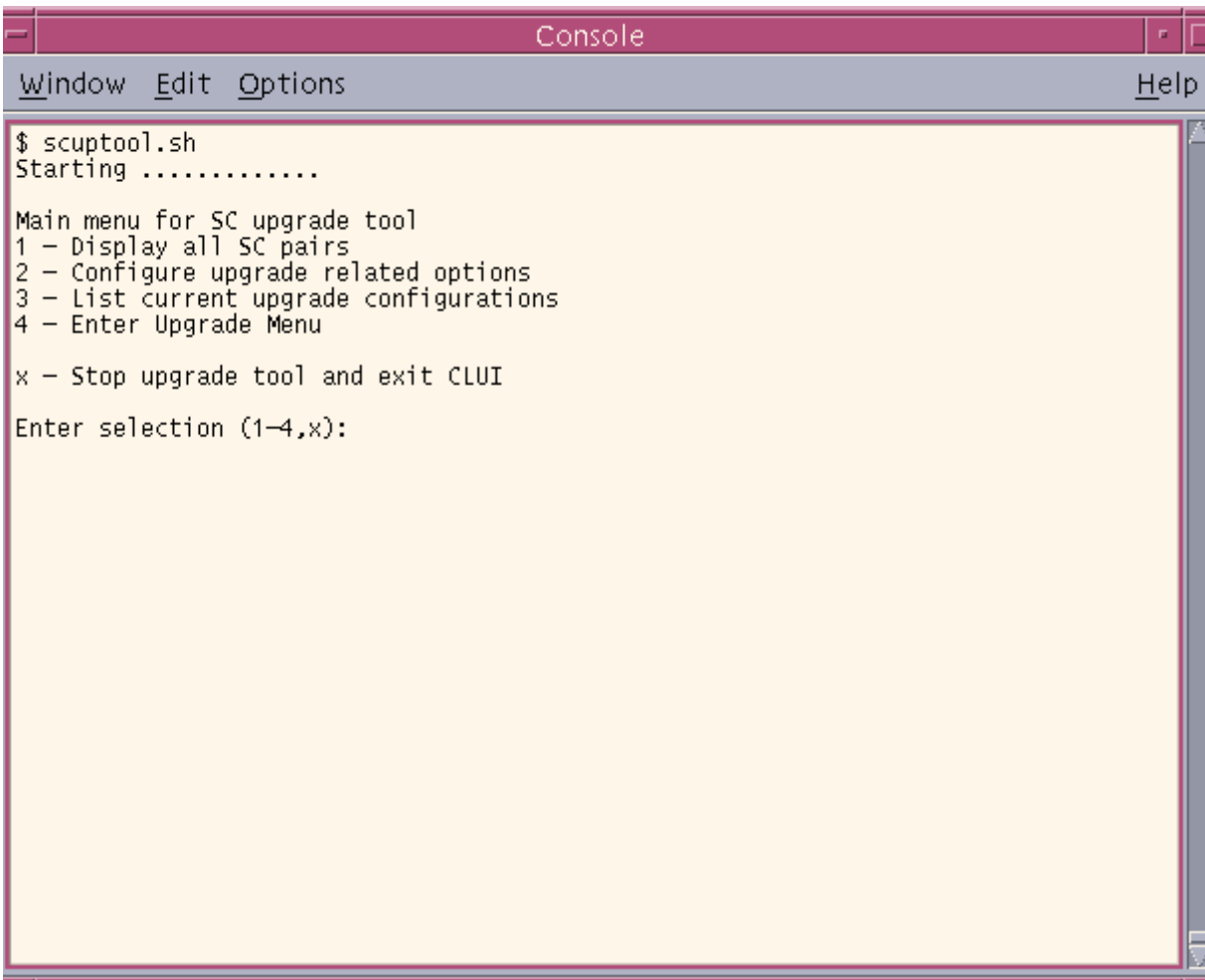
## 1.5 SC Upgrade Tool

In SN08, SC will provide a basic CLI interface and an interactive CLUI that is based on the basic CLI interface.

### 1.5.1 Interactive CLUI

The interactive CLUI is a shell that wraps basic CLI. It provides a “restricted” tool to achieve the upgrade goal.

Issue “scuptool.sh” to launch the SC upgrade tool CLUI. The main menu is as follows:



```
$ scuptool.sh
Starting .....

Main menu for SC upgrade tool
1 - Display all SC pairs
2 - Configure upgrade related options
3 - List current upgrade configurations
4 - Enter Upgrade Menu

x - Stop upgrade tool and exit CLUI
Enter selection (1-4,x):
```

There are a total of five selections in main menu. There are:

**1** Display all SC pairs

This selection queries all SC nodes information, including name, ip and state.

**2** Configure upgrade related options

This selection configures upgrade options manually. CLUI will prompt the end user to input the necessary information step by step. These options are effective during the whole upgrade process.

**3** List current upgrade configurations

This selection lists all options currently used.

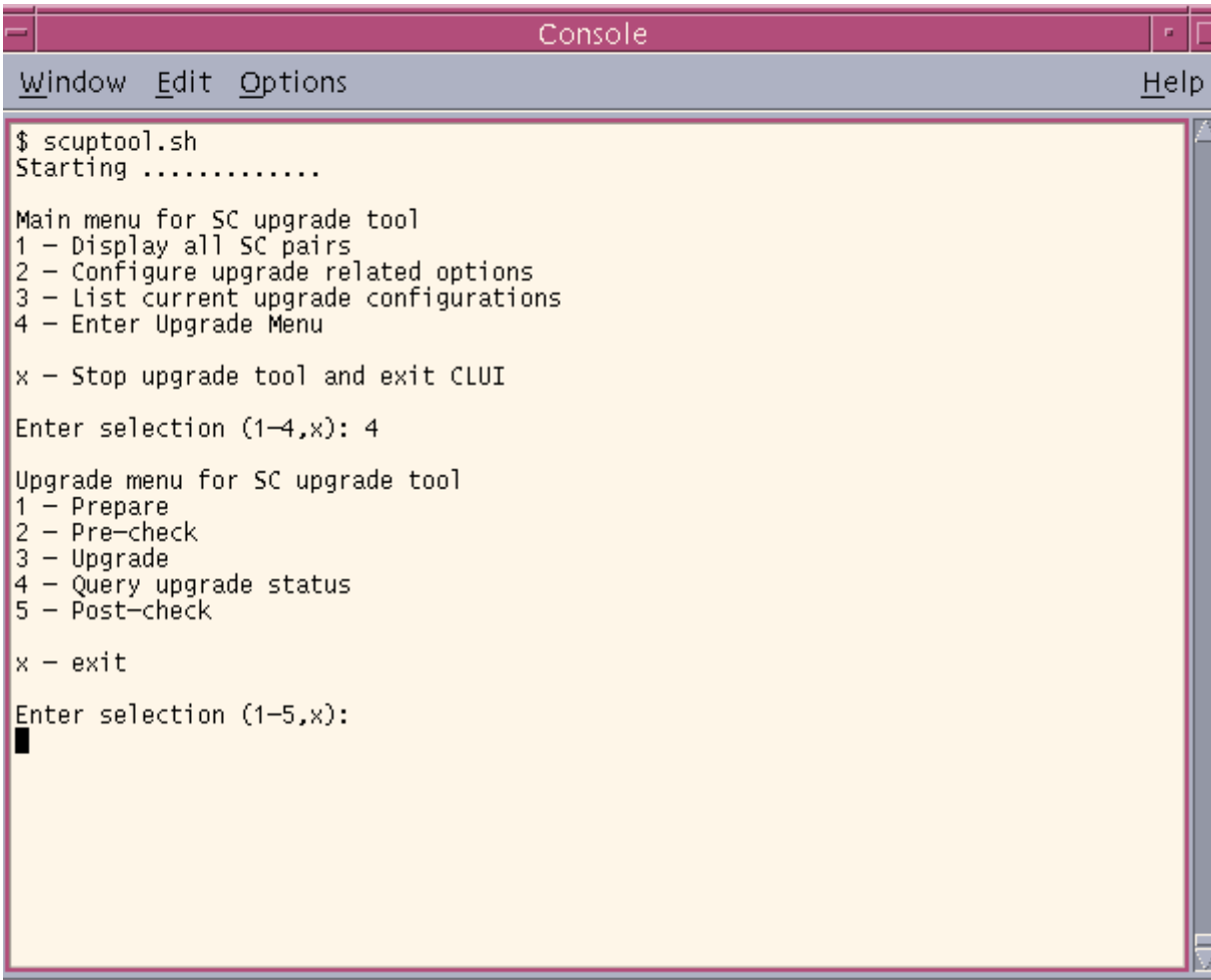
**4** Enter the upgrade menu

This selection enters the upgrade submenu.

## 5 Stop upgrade tool and exit CLUI

This selection stops the SC upgrade server and exits CLUI.

When selection 4 is selected, the end user enters the upgrade submenu to do the real upgrade process. The follow figure is the upgrade submenu:



```
Console
Window Edit Options Help
$ sulptool.sh
Starting .....

Main menu for SC upgrade tool
1 - Display all SC pairs
2 - Configure upgrade related options
3 - List current upgrade configurations
4 - Enter Upgrade Menu

x - Stop upgrade tool and exit CLUI
Enter selection (1-4,x): 4

Upgrade menu for SC upgrade tool
1 - Prepare
2 - Pre-check
3 - Upgrade
4 - Query upgrade status
5 - Post-check

x - exit
Enter selection (1-5,x):
```

There are a total of six selections in the upgrade submenu. All these selections are based on the options configured in the main menu.

- **Prepare**

This selection does the preparation prior to the actual upgrade.

- **Pre-check**

This selection does the pre-check prior to the actual upgrade.

- **Upgrade**

This selection does the real upgrade.

- **Query upgrade status**

This selection queries the upgrade status.

- **Post-check**

This selection does the post-check after the actual upgrade.

- **exit**

This selection exits the upgrade submenu and enters the main menu.

### 1.5.2 Basic CLI

The basic CLI provides the basic functions that the SC upgrading needs. They are:

- Start SC upgrade manager server prior to launching the client.
- Configure the upgrade options before the actual upgrade.
- Prepare the necessary steps for getting the tools and system ready prior to the actual upgrade.
- Pre-check relevant EM and configured SC states including the alarms.
- Upgrade configured SC with configured options.
- Post-check upgraded SC states including alarms.
- Query SC upgrade states in progress.
- Query SC information and list them.
- Query configurations currently used.
- Stop the upgrade manager server.
- The help facilities of the functions.

All these functions are provided by a shell named *scuptool.sh*. Although the end user can use every function in any order, we recommend that you should run the corresponding commands in an order which is given in the appendices. The order ensures you encounter, as little as possible, any warnings and errors. The order is mandatory

Corresponding functions to the above are achieved using the *gwcuptool.sh* command. The details are as follows.

#### 1.5.2.1 Start the SC upgrade manager server prior to client launching.

```
scuptool.sh -start [-sam21em ip:port] [-sid sid]
```

Command description:

Start the SC upgrade tool server, it does the following:

- 1 Request the end user to input a user name/password if not applying the session ID in the command.
- 2 Connect to SAM21EM through CORBA;
- 3 Check whether this user has permission to perform the upgrade operations.

Options:

[1] -sam21em

**Requirement:** Internally used options.

**Description:** Provides the CORBA server ip and port SAM21EM server registered.

**Default:** localhost:2001

[2] -sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

Example:

```
scuptool.sh -start -sam21em localhost:2001 -sid  
312308CDA87F5C7ECD3185F639892BC2
```

If the end user only issues “scuptool.sh -start”, only the user who belongs to one of “mgcmte, mgcadm, emsmte, emsadm” groups, can run the tool.

### 1.5.2.2 Configure the upgrade options before the actual upgrade.

```
scuptool.sh -config [-n <SC list>] [-o [value]] ...
```

Command description:

Configure upgrade options. These options are useful to upgrade, pre-check, post-check and query.

Note:

- 1 All configurations' default value will be stored in a property file on the upgrade manager server machine.
- 2 When only “scuptool.sh -config -list” is issued, the upgrade manager server will return all current configurations.

- 3 If the end user only issues “scuptool.sh -config”, shell will prompt the end user to input necessary information step by step.
- 4 When the second configuration command is issued, all prior configurations will be replaced.

The following are detailed options.

[1] -pa load\_directory\_name

**Requirement:** Optional

**Description:** Specify the load file path in SDM/CBM. If no directory name is applied, the default directory '/swd/sam21/' will be used.

**Default:** “/swd/sam21/”

**Example:**

-pa “/swd/sam21/”

[2] -f new\_load\_file\_name

**Description:** Target load file name. This option is mandatory.

**Default:** “”.

**Example:**

-f “11.0.0.047231351”

[3] -o old\_load\_name

**Requirement:** Optional

**Description:** The load upgrade from. If the end user ignores it, the upgrade manager server will bypass old load checking. By default the user does not need to specify the old load name, and all the selected SC pairs will be upgraded automatically.

**Default:** “”.

**Example:**

-o “10.0.0.047231351”

[4] -m <single | bulk >

**Description:** Upgrade mode (Optional)

single: all SC pairs will be upgraded one by one as ordered by the SC ID.

bulk: All other SC pairs will be upgraded at the same time.

**Default:** bulk.

**Example:**

-m bulk

[5] -p [0,1,2,3,4,5]

**Description:** Upgrade pause points. (Optional). If the end user does not provide this option, no pause points are done during upgrading.

The following list shows what the number means:

- For the first SC pair:
  - 1, before lock the first upgrade unit of “seed” pair.
  - 2, before warm-swact.

- 3, after “seed” pair upgraded.
- 4, pause on all above conditions.

- For bulk upgrade SC pairs:
  - 5, before warm-swact.

**Default:** 0, without any pause points.

**Example:**

```
-p '1,2,3'
```

The example option means the upgrade will pause on conditions 1,2,3.

```
[6] -d [VRB | MAJ | MNR | CRT ]
```

**Requirement:** Optional

**Description:** Define logging level for the upgrade log file.

VER: Logging verbose information.

MAJ: Logging major information.

MNR: Logging minor information.

CRT: Logging critical information.

**Default:** MAJ.

**Example:**

```
-d MNR
```

```
[7] -n <SC list>
```

**Description:** Provides a SC list for pre-check, upgrade, post-check and query.

**Default:** all

**Example:**

```
-n 'SC1,SC2,SC3,SC5'
```

```
[8] -t <mins>
```

**Description:** Define a time limitation for doing the upgrade. If the upgrade cannot complete all pairs within the given time slot, the un-upgraded SC pairs will be kept there. The upgrade will finish. If “0” is specified as the time limitation, the limitation check will be disabled

**Default:** 0

**Example:**

```
-t 180
```

Note: The time begins when “scuptool.sh -up” command is executed. A second “scuptool.sh -up” command does not reset the time slot.

```
[9] -np <max parallel number>
```

**Requirement:** Optional. Internally used by the designer.

**Description:** Max parallel number during the bulk upgrade.

**Default:** 8

**Example:**

```
-np 8
```

```
[10] -a [CRT | MAJ] -an [number]
```



**Requirement:** Optional.

**Description:** The allowed highest alarm level during the upgrade, and the allowed max alarm number during the upgrade. It is a dynamic alarm checking values. If the current alarm state has higher priority than is defined here, the upgrade program will be paused and the end user is notified of this.

For examples, if we specify “-a MAJ -an 2” in config step:

- If there are 3 MAJ alarms raised in the EM Server for this pair, the upgrade tool will be paused.
- If there is 1 MAJ alarm raised in the EM Servers for this pair, the upgrade tool will ignore it and continue the upgrade process.
- If there is 1 CRT alarm raised in the EM Server for this pair, the upgrade tool will be paused too because CRT has high priority than the MAJ alarms.

**Default:** MAJ 2

**Example:**

```
-a CRT -an 2
```

```
[11] -sid sid
```

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -config -f 11.0.0.047231351 -sid  
312308CDA87F5C7ECD3185F639892BC2
```

Note: This option is not a part of configuration.

A whole command format likes:

```
scuptool.sh -config -f 11.0.0.047231351 -o 10.0.0.047231351 -m bulk -p '1,3' -d CRT -  
n 'SC1' -t 120 -np 16 -a CRT -an 4 -sid 312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.3 Prepare the necessary steps for getting the tool and system ready prior to the actual upgrade.

```
scuptool.sh -prep [-sid sid]
```

Command description:

Shows the end user the necessary preparations that include upgrade steps and order, notes and warnings.

The following actions should be checked in prepare command:

- 1 Check the load available in SDM/CBM.
- 2 Make an upgrade plan for the SC and calculate the estimated time of the upgrade.

Options:

[1] -sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -prep -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.5.2.4 Pre-check relevant EM and configured SC states including alarms.

```
scuptool.sh -precheck -n <SC list>] [-sid sid]
```

Command description:

Pre-check the necessary conditions before upgrade.

If there is no SC list, the configured SC list will be used instead.

Perform the following actions:

- 1 SAM21EM server status
- 2 Load is available on the load server.
- 3 Alarm status.
- 4 Hardware level health check. If the pair has two physical units, check both of them are in service.
- 5 Whether the inactive unit is in hot-standby.

[1] -n <SC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** SC pairs which should be upgraded. If there is no given SC list, the configured SC list will be used instead.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -precheck -sid  
312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.5 Upgrade configured SC with configured options.

```
scuptool.sh -up [ -n <SC list>] [-sid sid]
```

Command description:

The command does the real upgrade work. You still perform the pre-check / post-check in this command. During the upgrade, the client side will display the logs sent from the server side. Also, the end user may need to answer some question or do some confirmation for different conditions. If the end user enabled break points, this tool will work in interactive mode.

If there is no SC list, the configured SC list will be used instead.

Note: Must prompt the end user to do the pre-check before upgrading. The pre-checked SC list is stored in the server side. If there is no pre-checked SC, the server will refuse upgrading.

[1] -n <SC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** SC pairs which should be upgraded. If there is no given SC list, the configured SC list will be used instead.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -up -sid  
312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.6 Post-check upgraded SC states including alarms.

```
scuptool.sh -postcheck [ -n <SC list>] [-sid sid]
```

Command description:

Do the post-check for the given SC pairs.

If there is no SC list, the configured SC list will be used instead.

The following status will be checked:

- Hardware status from SAM21EM.

- Alarm state

[1] -n <SC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** SC pairs which should be upgraded. If there is no given SC list, the configured SC list will be used instead.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -postcheck -sid  
312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.7 Query upgrade states in progress.

```
scuptool.sh -query [ -n <SC list> ] [-sid sid]
```

Command description:

Query the status of SC pairs and the upgrade status.

The status includes two parts. If there is no upgrading SC, then no part A status exists.

If there is no SC list, the configured SC list will be used instead.

- Upgrade status report.

The report includes the following items:

- SC-ID: e.g. SC3
- Current upgrade step: e.g. SWACT.
- Spent time: e.g. 4 minutes
- Time left: e.g. about 5 minutes.

- B. Unit status report

The report items:

- SC Unit name: SC Unit IP
- SC load information. Upgraded or not.
- Status from SAM21EM

[1] -n <SC List>

**Requirement:** Internally used by the MOP automation tool

**Description:** SC pairs which should be upgraded. If there is no given SC list, the configured SC list will be used instead.

[2] -sid sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -query -sid  
312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.8 Query SC information and list them.

```
scuptool.sh -query -n all [-sid sid]
```

Command description:

Used to query all SC information including name, ip and state.

This command reuses the “scuptool.sh -query” interface, it can list all SCs’ information.

**Example:**

```
scuptool.sh -query -n all -sid  
312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.9 Query configurations currently used.

```
scuptool.sh -config -list [-sid sid]
```

Command description:

Queries current configurations. It reuses the “scuptool.sh -config” interface.

**Example:**

```
scuptool.sh -config -list -sid  
312308CDA87F5C7ECD3185F639892BC2
```

### 1.5.2.10 Stop upgrade manager server.

```
scuptool.sh -stop [-sid sid]
```

Command description:

Stop upgrade server.

Options:

[1] -sid

**Requirement:** Internally used by the MOP automation tool

**Description:** Provides session ID upgrade manager uses. The upper-level upgrade manager can provide a valid session ID to avoid re-login. The end user need not input this option.

**Default:** 0

**Example:**

```
scuptool.sh -stop -sid  
312308CDA87F5C7ECD3185F639892BC2
```

#### 1.5.2.10.1 Help of the functions.

```
scuptool.sh -start -h  
scuptool.sh -config -h  
scuptool.sh -prep -h  
scuptool.sh -precheck -h  
scuptool.sh -up -h  
scuptool.sh -postcheck -h  
scuptool.sh -query -h  
scuptool.sh -stop -h
```

Command description:

Shows the end user the help facilities of the functions. It includes function description, option meaning and usage.

Appendix 2 gives you an example of how you use these separate commands to achieve a complete upgrade task.

## 1.6 Hardware Requirements or Dependencies

No new hardware or hardware dependencies are introduced.

## 1.7 Software Requirements or Dependencies

No new customer software or firmware dependencies are introduced in this feature.

## 1.8 Limitations and restrictions

The limitations and restrictions work on both the GWC and SC upgrade manager except for the items specified.

- 1 For Upgrade Manager Phase I, the upgrade tools must be running in the same SSPFS box with GWCEM/SESM and SAM21EM.
- 2 This version will not support multiple users. But the end user can upgrade GWC nodes or SC pairs in parallel.
- 3 This version does not support automatically downgrade. The end user must downgrade NE manually.
- 4 Both the GWC and SC upgrade server only provide support for a full node upgrade. They do not allow a single card/unit to be upgraded.

## 1.9 Interactions

No interactions between this feature and existing features.

## Appendix 1: An example of how to use gwcuptool.sh to complete GWC upgrade in an office.

For SN08, the GWC upgrade order is:

- 1 Audio
- 2 BICC (UA-AAL1 solutions only)
- 3 VRDN
- 4 Session Server (SN08 to SN08 upgrades only)
- 5 SIP-T/APG/RA
- 6 APG/RA
- 7 SIP-T/APG
- 8 APG
- 9 SIP-T
- 10 Trunk
- 11 H.323 (new in SN06.2)
- 12 Proxy [RTP MP])
- 13 V5.2 Trunk
- 14 Lines (includes CICM)

Assumption:

- |         |                      |
|---------|----------------------|
| 1 Audio | GWC-1, GWC-3, GWC-5  |
| 2 BICC  | GWC-7, GWC-9, GWC-11 |

|    |                       |                        |
|----|-----------------------|------------------------|
| 3  | VRDN                  | GWC-13, GWC-15, GWC-17 |
| 4  | SIP-T/APG/RA          | GWC-19, GWC-21, GWC-23 |
| 5  | APG/RA                | GWC-25, GWC-27, GWC-29 |
| 6  | SIP-T/APG             | GWC-31, GWC-33, GWC-35 |
| 7  | APG                   | GWC-37, GWC-28, GWC-39 |
| 8  | SIP-T                 | GWC-32, GWC-34, GWC-36 |
| 9  | Trunk                 | GWC-26, GWC-28, GWC-30 |
| 10 | H.323 (new in SN06.2) | GWC-20, GWC-22, GWC-24 |
| 11 | Proxy [RTP MP])       | GWC-14, GWC-16, GWC-18 |
| 12 | V5.2 Trunk            | GWC-8, GWC-10, GWC-12  |
| 13 | Lines (includes CICM) | GWC-2, GWC-4, GWC-6    |

**Note:** You also can get the information by using the “gwcuptool.sh query -n all” command.

**Step 1: Create a soak image on GWC-1. (Which GWC is selected is determined by yourself.)**

Create the SSH communication channel.

```
ssh
```

//start um server by inputting the following command:

```
gwcuptool.sh -start
```

//If this fails, upgrade-man checks the CORBA naming service and EM server state.

///Retry after checking.

//configure all options for upgrading the first GWC and creating the soak image:

```
gwcuptool.sh -config -pa "/swd/gwc/" -f pn080ak.imag  
-m single -p 5 -d VRB -n "GWC-1" -t 120 -a CRT -an 4
```

//If this fails, check retry or abort.

//print what upgrade-man needs to prepare:

```
gwcuptool.sh -prep
```

//Pre-check configured GWC;

```
gwcuptool.sh -precheck
```

//If this fails, check and retry or abort.



```
//Upgrade configured GWC:
gwcuptool.sh -up
//If this fails, check and retry or abort.

//Post-check configured GWC:
gwcuptool.sh -postcheck
//If this fails, check and retry or abort.

//Stop um server:
gwcuptool.sh -stop
//If this fails, check and retry or abort.
```

**Step 2: Using the soak image to upgrade other GWCs.**

Create the SSH communication channel.

```
ssh

//start um server.
gwcuptool.sh -start
//If this fails, check and retry or abort.

//Query available GWC. Shell will print out name, ip etc.:
gwcuptool.sh -query -n all

//Configure all options for upgrading. Pause points are removed for bulk
//upgrading. Upgrade-man can select the GWC list for configuration by above
//one command:
gwcuptool.sh -config -pa "/swd/gwc/" -f pn080ak.imag
-m bulk -d VRB -n 'GWC-7,GWC-9,GWC-11' -t 120 -a CRT
-an 4
//If this fails, check and retry or abort.

//Print what upgrade-man needs to prepare:
gwcuptool.sh -prep

//Pre-check configured GWC:
gwcuptool.sh -precheck
//If this fails, check and retry or abort.

//Upgrade configured GWC:
gwcuptool.sh -up
//If this fails, check and retry or abort.
```

//Upgrade-man can query the upgrading state until the upgrade completes:

```
gwcuptool.sh -query
```

//If this fails, check and retry or abort.

//Post-check configured GWC:

```
gwcuptool.sh -postcheck
```

//If this fails, check and retry or abort.

//Stop um server:

```
gwcuptool.sh -stop
```

//If this fails, check and retry or abort.

## Appendix 2: An example of how to use scuptool.sh to complete SC upgrade in an office.

Assumption: There are a total of 8 SC pairs in an office. They are from SC1 to SC8.

### Step 1: Upgrade one SC. Pause at all pause points to make upgrade-man has chance to verify.

Create the SSH communication channel:

```
ssh
```

//start um server by inputting the following command:

```
scuptool.sh -start
```

//If this fails, upgrade-man checks the CORBA naming service and EM server state. Retry after checking.

//configure all options for upgrading the first SC:

```
scuptool.sh -config -pa "/swd/sam21/" -f  
11.0.0.0.2222 -m single -p 4 -d VRB -n SC1 -t 120 -a  
CRT -an 4
```

//If this fails, check, retry or abort.

//print what upgrade-man needs to prepare:

```
scuptool.sh -prep
```

//Pre-check configured SC:

```
scuptool.sh -precheck
```

//If this fails, check and retry or abort.

//Upgrade configured SC:

```
scuptool.sh -up
```

```
//If this fails, check and retry or abort.
```

```
//Post-check configured SC:
```

```
scuptool.sh -postcheck
```

```
//If this fails, check and retry or abort.
```

```
//Stop um server:
```

```
scuptool.sh -stop
```

```
//If this fails, check and retry or abort.
```

## **Step 2: Bulk upgrading other SCs. No pause point.**

Create the SSH communication channel:

```
ssh
```

```
//start um server:
```

```
scuptool.sh -start
```

```
//If this fails, check and retry or abort.
```

```
//Query SC information:
```

```
scuptool.sh -query -n all
```

```
//Configure all options for upgrading:
```

```
scuptool.sh -config -pa "/swd/sam21/" -f  
11.0.0.0.2222 -m bulk -d VRB -n 'SC1,SC2,SC3' -t 120  
-a CRT -an 4
```

```
//If this fails, check and retry or abort.
```

```
//Print what upgrade-man needs to prepare:
```

```
scuptool.sh -prep
```

```
//Pre-check configured SC:
```

```
scuptool.sh -precheck
```

```
//If this fails, check and retry or abort.
```

```
//Upgrade configured SC:
```

```
scuptool.sh -up
```

```
//If this fails, check and retry or abort.
```

```
//Upgrade-man can query upgrading state until upgrade completes:
```

```
scuptool.sh -query
```

```
//If this fails, check and retry or abort.
```

```
//Post-check configured SC:  
  
scuptool.sh -postcheck  
//If this fails, check and retry or abort.  
  
//Stop um server:  
  
scuptool.sh -stop  
//If this fails, check and retry or abort.
```

### Appendix 3: Upgrade mode examples in GWC upgrade tool

Here is an example where we can explain the GWC upgrade mode much more clearly.

In the customer office, there are the following GWCs:

Audio GWC: GWC-1

Trunk GWC: GWC-12, GWC-13, GWC-14

Line GWC: GWC-5, GWC-6, GWC-7, GWC-8, GWC-9, GWC-10

Based on the “Upgrading the Gateway Controller, NN10196-461”, we need to upgrade the Audio GWC first, then the Trunk GWCs, and the Line GWCs last.

#### **In the single mode: running with “gwcupptool.sh -config -f NewLoadFileName -m single”**

GWCs will be upgraded one by one, and obey the service type order. So the upgrade order will be:

- 1 GWC-1 (Audit GWC. apply patch; create soak image for other GWCs)
- 2 GWC-12 (Trunk GWC)
- 3 GWC-13 (Trunk GWC)
- 4 GWC-14 (Trunk GWC)
- 5 GWC-5 (Line GWC)
- 6 GWC-6 (Line GWC)
- 7 GWC-7 (Line GWC)
- 8 GWC-8 (Line GWC)
- 9 GWC-9 (Line GWC)
- 10 GWC-10 (Line GWC)

#### **In the bulk mode: running with “gwcupptool.sh -config -f NewLoadFileName -m bulk”**

All GWCs within the same service type will be upgraded at the same time. the upgrade order will be:

- 1 GWC-1 (Audit GWC. apply patch; create soak image for other GWCs)
- 2 GWC-12, GWC-13, GWC-14 (Trunk GWC)
- 3 GWC-5, GWC-6, GWC-7, GWC-8, GWC-9, GWC-10 (Line GWC)

**In mix mode: running with “gwcuptool.sh -config -f NewLoadFileName -m mix”**

The first GWC node within the same service type group will be upgraded first, then all other GWCs in the same group will be upgraded in parallel at the same time. The upgrade order will be:

- 1 GWC-1 (Audit GWC, apply patch, create the soak image for other GWCs)
- 2 GWC-12 (Trunk GWC)
- 3 GWC-13, GWC-14 (Trunk GWC)
- 4 GWC-5 (Line GWC)
- 5 GWC-6, GWC-7, GWC-8, GWC-9, GWC-10 (Line GWC)

## 1.10 Glossary

| Term     | Explanation                                    |
|----------|------------------------------------------------|
| CS2M     | CS2000 Management Components                   |
| SESM     | Succession Element Sub-element Manager         |
| SAM21 EM | CS2000 SAM21 Manager                           |
| NPM      | Network Patch Manager                          |
| SSPFS    | Succession Server Platform Foundation Software |
| CLUI     | Command line user interface                    |
| CLI      | Command line interface.                        |
| SDM      | SuperNode Data Manager                         |

***Product = MG 9000***

**A00007213--MG9000 5/30 minutes OMs**

## ***Functional Description***

### **1.1 Applicable Solution(s)**

UA-IP

### **1.2 Description**

This feature consists of following deliverable.

1. This feature allows the user to configure Sample interval and Summary intervals on SN08 MG9K from MG9KEM. This configuration is supported through a new configuration GUI "Configure Collection Interval", which will be introduced under the submenu option MG9KEM Subnet view ->Performance. All the MG9Ks in a Subnet are configured with same intervals.

In SN08, user is allowed to select following combinations of Sample and Summary intervals from GUI.

- Sample and Summary intervals of 5 and 30 minutes respectively.
- Sample interval of 15 minutes and no Summary interval.

In the new configuration GUI, Sample and Summary intervals are specified in terms of minutes.

Example: For the Sample and Summary intervals of 5 and 30 minutes, user has to select the value "5/30 minutes" in the GUI. For the 15 minutes Sample interval, user has to select the value "15 minutes" in the GUI.

2. Whenever Collection intervals are changed, Performance browser and OM Collector behave as follows.
  - OM Collector will start collecting OMs at new collection intervals, starting from next collection interval.
  - After Collection interval is changed, if User tries to collect performance data, Performance browser will collect OMs at new Sample collection interval.

Refer to the limitation mentioned in section 2.5.

3. Following changes are done in Performance browser.
  - The intervals shown in Performance browser are based on the Sample interval. That means, intervals shown in the fields "From" and "To" of Performance browser are based on Sample interval.

Note that, Only Sample intervals are shown on Performance browser. 96 intervals are shown irrespective of sample interval value.

4. OM Collector generates CSV files named with appropriate tag to indicate the collection interval of the OM data, which is stored in CSV file. To be inline with the tag used today for 15 minutes interval, following tags will be used for new intervals in SN08.

For 5 minutes interval: 5\_MIN\_TRAFFIC

For 30 minutes interval: 30\_MIN\_TRAFFIC

CSV filename convention:

<NEType>.<NodeName>.OMs.<ReportName>.<Year>.<Month>.<Day>\_<Hour>.<Minute>\_<TimeZone>.<fileextension>

Example CSV file names:

- MG9000.CO18.OMs.5\_MIN\_TRAFFIC.2003.06.06\_13.15\_EDT.csv
  - MG9000.CO18.OMs.15\_MIN\_TRAFFIC.2003.06.06\_13.15\_EDT.csv
  - MG9000.CO18.OMs.30\_MIN\_TRAFFIC.2003.06.06\_13.15\_EDT.csv
5. Once CSV file is generated successfully, OM Collector sends CORBA notification with following information.
    - Source IP address (IP address of the EM workstation, where CSV file is available. In a HA system, this is the Virtual IP address).
    - CSV filename with complete path
    - NE IP address (IP address of the NE for which the CSV file is generated)
  6. When OMs are not available, reason for the same would be available in the SFTP response. When OMs are not available, OM Collector will raise a minor alarm. OM Collector will try to extract the reason from SFTP response and will put the same in appropriate field/s of the alarm. OM Collector also logs these alarms in Customer log. OM Collector will clear the alarm when OMs are available again.
  7. OM Collector is integrated with MG9KEM as detailed below
    - Configuration of OM Collector will be integrated with that of MG9KEM server.
    - OM Collector will be started and stopped along with MG9KEM server.

Even though OM Collector is brought inside MG9KEM, OM Collector is retained as a separate JAR and is delivered as a separate package.

### 1.3 Hardware Requirements or Dependencies

None

### 1.4 Software Requirements or Dependencies

This feature depends on A00007107 (MG9K feature to support 5/30 minutes).  
This feature requires A00007107 at least by the time of its Integration testing.

With reference to the requirement #5 mentioned in [1], this feature sends a notification. The IEMS feature A00007388 (MG9K Performance integration) uses this notification. Hence, IEMS feature A00007388 depends on the delivery of A00007213.

### 1.5 Limitations and restrictions

When MG9KEM changes Collection interval, any data collected by OM Collector and/or Performance browser till the end of current collection interval after MG9KEM changes collection intervals, may not be accurate. Following paragraphs explain the reason for this.

#### Example #1:

Let us consider that, MG9KEM changes the collection intervals say from 15 to 5/30 minutes, at 9:06 AM. In this scenario, MG9KEM and OM Collector will switch over starting from next collection interval time as explained below.

- OM Collector will collect new Sample interval (i.e, 5 min in this example) starting from 9:10 AM and Summary interval starting from 9:30 AM.
- Performance browser will changeover immediately. i.e, it will show Collection time period in terms of new Sample collection interval.

However, MG9K changes over to new collection interval at end of current collection interval (i.e., at 9:15 AM in the scenario explained above). Also, MG9K flushes its history performance data at 9:15 AM.

Because of this behavior difference between MG9K and MG9KEM PM components (i.e., performance browser and OM Collector), any data collected by OM Collector and/or Performance browser till and including 9:15 AM, may not be accurate.

#### Example #2:

Let us consider that, MG9KEM changes the collection intervals say from 5/30 to 15 minutes, at 9:06 AM. In this scenario, MG9KEM and OM Collector will switch over starting from next collection interval time as explained below.

- OM Collector will collect new Sample interval (i.e, 15 min in this example) starting from 9:15 AM.



- Performance browser will changeover immediately. i.e, it will show Collection time period in terms of new Sample collection interval.

However, MG9K changes over to new collection interval at end of current collection interval (i.e., at 9:10 AM in the scenario explained above). Also, MG9K flushes its history performance data at 9:10 AM.

Because of this behavior difference between MG9K and MG9KEM PM components (i.e., performance browser and OM Collector), any data collected by OM Collector and/or Performance browser till and including 9:15 AM, may not be accurate.

## 1.6 Interactions

This feature interacts with the SN07 feature, A00003531 (MG9KEM - Frame location enhancements) as follows;

- The SN07 feature A00003531 replaces Internal frame number by Office frame number in the CSV files for 15 minutes interval. This capability is utilized in SN08 for the new intervals 5 and 30 minutes also.
- This feature uses the capability introduced by A00003531 to either enable or disable OM data collection for a particular MG9K.

## 1.7 Glossary

| Term                            | Description                                                                                                                                                                                                                                                                                                              |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collection interval or interval | Time interval for which MG9K either periodically or upon request from application such as OMC, generates performance data.                                                                                                                                                                                               |
| Collection time period          | This is the time period shown in Performance browser. User is allowed to select one or more collection intervals from this time period and can request to collect history data for those many number of past intervals. Based on the Sample collection interval, Collection intervals are shown within this time period. |
| EM                              | Element Manager                                                                                                                                                                                                                                                                                                          |
| Internal (logical) frame number | Frame number, which is unique within a MG9K                                                                                                                                                                                                                                                                              |
| MG9K                            | Media Gateway 9000                                                                                                                                                                                                                                                                                                       |

| Term                           | Description                                                                                                                                               |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| MIB                            | Management Information Block.<br><br>RFC-driven MIBs are standard MIBs defined in RFC. Enterprise MIB is one written by Nortel.                           |
| Office (External) frame number | Frame number, which is unique within an office                                                                                                            |
| OM                             | Operational Measurement                                                                                                                                   |
| OMC                            | OM Collector                                                                                                                                              |
| Performance Browser            | It is a component of MG9K EM. It collects performance data (both previous and current) from MG9K through SNMP interface and shows them in tabular format. |
| PV                             | Product Verification                                                                                                                                      |
| Sample Interval                | The interval which the MG collects and stores OM information in its MIBs. Interval to be 5 or 15 minutes                                                  |
| Summary Interval               | An aggregation of sample intervals calculated at the MG. This interval is expected to be 30 (6x5) or 1.                                                   |

## 1.8 Recommended Reading/References

[1] A00007213\_5\_30\_MINUTE\_OM\_DID.fm Version 1.0

[2] A00007107\_OMs\_5\_30.doc Version 1.0

## 2: Fault Management for A00007213

### 2.1 Fault management strategy

This feature uses the existing MG9KEM Fault management framework to raise and clear alarms.

### 2.2 Fault management tools and utilities

NA

## 2.3 Logs

### 2.3.1 Log Title/Log ID: OMC300

#### 2.3.1.1 Formats

MSH10\_I06BR \*\*\* OMC300 JUN20 15:29:20 4642 TBL OMDataCollectionFailed  
Location: 1-RM9K  
Notification Id:1000  
State: not acknowledged  
Category: Communication Alarm  
Cause: Communications Subsystem Failure  
Time: Jun 20 15:29:20 2003  
Component Id: MG9k EM Comm Network  
Specific Problem: OM data collection failed  
Description:  
Site Flr RPos Bay\_id  
FFFF FF FFF FFFF FFF

#### 2.3.1.2 Explanation

Description: Log report OMC300 indicates that OM Collector failed to collect OM file from MG9K during a particular collection interval.

### 2.3.1.3 Field descriptions

Table 1: Field descriptions

| Field            | Value             | Description                                                                                           |
|------------------|-------------------|-------------------------------------------------------------------------------------------------------|
| event type       | TBL               | Describes event type                                                                                  |
| event id         | string            | Log name. In this case, it is OMC300                                                                  |
| Location         | NE Number-NE Name | Gives a complete location of the originator                                                           |
| Notification Id  | Alarm if          |                                                                                                       |
| State            | string            | Indicates state of alarm. Can be one of {not acknowledged, acknowledged, cleared}                     |
| Category         | string            | Indicates type of fault. In this case it is "Communication Alarm"                                     |
| Cause            | string            | Cause of failure: In this case it is "Communications Subsystem Failure"                               |
| Time             |                   | Date/Time indicating when the condition occurred                                                      |
| Component Id     | string            | Indicates the type of equipment having the fault.                                                     |
| Specific Problem | string            | Indicates the specific problem that caused the fault                                                  |
| Description      | string            | Provides specific text for the fault.<br><br>In this case, it consists of Frame location information. |

### 2.3.1.4 Action

Check the following

- whether MG9K is traffic overloaded.

### 2.3.1.5 Associated Operational Measurements or Performance Measurements

None

### 2.3.1.6 Additional information

Following is a list of reasons for the generation of the log report OMC300.

- MG9K is traffic overloaded
- Disk may be full. Hence, the OM Collector is not able to store the downloaded OM file.
- Gateway user id and password mentioned may be wrong
- OM file details mentioned in the SFTP request may be wrong

## 2.3.2 Log Title/Log ID: OMC300

### 2.3.2.1 Formats

MSH10\_I06BE OMC300 APR23 08:50:10 5176 INFO OM Collection failed  
Alarm Cleared

Location: 1-RM9K (Act)

Description: OM collection failed alarm cleared.

### 2.3.2.2 Explanation

Description: Log report OMC300 indicates that OM Collector could restart collecting OM file from MG9K, for which it had problem.

### 2.3.2.3 Field descriptions

Table 2: Field descriptions

| Field       | Value             | Description                                 |
|-------------|-------------------|---------------------------------------------|
| event type  | INFO              | Describes event type                        |
| event id    | string            | Log name. In this case, it is OMC300        |
| Location    | NE Number-NE Name | Gives a complete location of the originator |
| Description | string            | Provides specific text for the fault        |

### 2.3.2.4 Action

This log report requires no action.

### 2.3.2.5 Associated Operational Measurements or Performance Measurements

None

### 2.3.2.6 Additional information

None

## 2.4 Alarms

### 2.4.1 Integrated Element Manager GUI Fields

Table 3: IEMS Alarm GUI Field descriptions

| Field           | Value                                        |
|-----------------|----------------------------------------------|
| Severity        | Minor                                        |
| Category        | Communication Alarm                          |
| LogName         | OMC                                          |
| LogNumber       | 300                                          |
| EventType       | TBL                                          |
| EventLabel      | TBD                                          |
| ProbableCause   | Communications Subsystem Failure             |
| SpecificProblem | OM data collection failed                    |
| BodyText        | Site Flr RPos Bay_id<br>FFFF FF FFF FFFF FFF |

### 2.4.2 SNMP Northbound Alarm Event (Non-legacy logs only)

NA (Alarm raised for this feature are EM specific)

### 2.4.3 Explanation

Description: OM Collector could not collect OM file for a particular NE for a particular collection interval. Severity: Minor

### 2.4.4 Action

Check the following

- whether MG9K is traffic overloaded.

### 2.4.5 Corresponding Clear Log

Log Title: **OMC300**

#### 2.4.5.1 Format

MSH10\_I06BE OMC300 APR23 08:50:10 5176 INFO OM Collection  
failed Alarm Cleared  
Location: 1-RM9K (Act)  
Notification Id: 1000  
State: Cleared

Description: OM collection failed alarm cleared.

#### **2.4.5.2 NTSTD**

MSH10\_I06BE OMC300 APR23 08:50:10 5176 INFO

Location: 1-RM9K

Notification Id: 1000

State: Cleared

Time: APR23 08:50:10 2004

#### **2.4.5.3 SCC2**

19 OMC 300 5176 INFO

Location: 1-RM9K

Notification Id: 1000

State: Cleared

Time: APR23 08:50:10 2004

#### **2.4.5.4 Syslog**

Feb 24 19:19:43 wnc0s0pf IEMS:

\_V2\_~I=~H=wnc0s0pf~A=IEMS~S=0618~~ OMC300 NONE INFO ^M

Location: 47.166.56.10^M Notification Id: 13^M State: Cleared^M

Time: Jan 24 19:19:49 2004

#### **2.4.5.5 SNMP**

NA (since, these alarm are originated from EM)

### **2.5 Related documentation**

[1] A00007213 FN

## **3: Configuration for A00007213**

### **3.1 Hardware and Software Requirements**

None

### **3.2 Initial Configuration**

NA

### **3.3 Office/Subnet parameters (OP/SP) (CM & SESM)**

NA

## 3.4 Upgrade Considerations

### 3.4.1 Element Management Upgrade

#### 3.4.1.1 Element Management Upgrade from SN07 to SN08

Here are the steps to upgrade MG9K Manager software from SN07 to SN08.

1. Stop SN07 OM Collector (Refer to note #1 in this section).
2. Uninstall SN07 OM Collector package
3. Install SN08 EM package (Note that, user is not allowed to install SN08 EM server package if SN07.x OMC package exists)
4. Install SN08 OMC.
5. Start SN08 MG9KEM

All the MG9Ks in a subnet are configured with same collection intervals. SN07 MG9K support 15 minutes Collection interval. Hence, Collection interval is not allowed to be set to anything other than 15 minutes until all MG9Ks are upgraded to SN08.

Note #1: SN07 OMC keeps CSV files in /data/oms/1. If SN08OMC is also configured to keep CSV files in /data/oms/1, then we will have problem if SN07 OMC is also left running, since both would try to write CSV file into the same directory. To avoid this problem, step #1 shall be performed before step #5.

#### 3.4.2.2 Element Management Upgrade from SN06.x to SN08

Here are the steps to upgrade MG9K Manager software from SN06/SN06.2 to SN08.

1. Start SN08 MG9KEM
2. Consider one SN06.x NE at a time. Before performing step #3, delete the NE from SN06.2 OMC (Refer to note #1 and #2)
3. When the NE is upgraded to SN08 software, enable OM collection for SN06.2 NEs in SN08 MG9KEM.
4. Repeat step #2 and #3 for each NE.

Note #1: The reason for performing step #2 after step #1 is as follows. After step #1, older NEs would be upgraded to SN08. If there are more older NEs, then this would take relatively more time. If we remove all the NEs from SN06.x OMC immediately after step #1, then we would lose OM data for the period wherein older NEs are upgraded to SN08.

Note #2: The reason for performing step #2 before step #3 is as follows. SN08 NE support SFTP and SN06.2 OMC supports only FTP. If NE still exists in



SN06.2 OMC even after NE is upgraded to SN08 (i.e, step #3), then data collection would fail.

### 3.4.2 Downgrade impact

#### 3.4.2.1 Element Management Upgrade from SN08 to SN07/SN06.x

When collection interval is 5/30 minutes, if a NE is downgraded to older release, then disable OM collection for the downgraded NE. With this, OMC does not collect data for the downgraded NE. The reason is that, downgraded NE can not collect at 5/30 minutes.

## 3.5 Data schema (DS) (CM, MIBS, RDB)

### 3.5.1 New/modified tables, MIBs, or Database Schema

Table 4 New or modified tables

| Table/MIB name       | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|----------------------|--------------------------|------------------------------------|
| OFFICE_WIDE_DEFAULTS | Changed                  | Unchanged                          |

### 3.5.2 Table/MIB/Remote Database Schema information

#### 3.5.2.1 Name: OFFICE\_WIDE\_DEFAULTS

Office wide defaults Database table.

##### 3.5.2.1.1 Functional description

One more entry is made in this existing database table to store Collection intervals.

##### Impact on existing functionality of enabling/disabling of OM collection:

When OM Collection is enabled or disabled for a NE through GUI, the database variable OMCSTATUS in the database table NODE\_ATTRIBUTES will be set to enabled.

While a pre SN08 NE is discovered, current collection interval (which is configured at EM) will be checked. If it is 5/30 minutes, the database variable OMCSTATUS will be set to disabled. In turn, OM collection will be disabled from next collection cycle.

##### Impact on discovery of NE:

While a SN08 NE is discovered, current collection interval (which is configured at EM) will be pushed to the NE. In case the push fails, discovery would still continue. The mismatch will be rectified when NE is audited next time.

### 3.5.2.1.2 Usage sequence and implications (CM Only)

None

### 3.5.2.1.3 Size

**Table 5 Table size**

| Abbreviated table name | Minimum tuples             | Maximum tuples                          | Information on memory                 |
|------------------------|----------------------------|-----------------------------------------|---------------------------------------|
| OFFICE_WIDE_DEFAULTS   | Same as current table size | One more entry than current table size. | Memory requirement is less than 1 KB. |

### 3.5.2.1.4 Fields/OIDs

The following table lists fields/OIDs for OFFICE\_WIDE\_DEFAULTS

**Table 6 Table field descriptions**

| Field          | New or Changed | Subfield or refinement | Entry                                    | Explanation and action |
|----------------|----------------|------------------------|------------------------------------------|------------------------|
| DFLT_NAME      | Changed        | NA                     | New value "Collection_Interval" is added |                        |
| DFLT_SUBSYSTEM | Changed        | NA                     | OMC                                      |                        |
| DFLT_VALUE     | Changed        | NA                     | Default value is "15 Minutes"            |                        |

### 3.5.2.1.5 Datafill example

None

### 3.5.2.1.6 Table release history update

One more entry is made in the table OFFICE\_WIDE\_DEFAULTS, to store the Collection intervals. This entry is made either during major release upgrade or during SN08 MR upgrade.

### 3.5.2.1.7 Supplementary information

The Collection interval value stored in the table OFFICE\_WIDE\_DEFAULTS is applicable for all the NEs present in the subnet.

### 3.5.2.1.8 Translation verification and other tools

None

### 3.6 Service Orders (SO) (CM & SESM)

NA

### 3.7 Software optionality control (SOC)

NA

### 3.8 Element Management

#### 3.8.1 New/modified GUIs

Table 7 New or modified GUIs

| GUI name                       | NEW, CHANGED, or DELETED |
|--------------------------------|--------------------------|
| Configure Collection Interval  | New                      |
| Performance Statistics Browser | Changed                  |

#### 3.8.2 GUI information

##### 3.8.2.1 GUI name: Configure Collection Interval

###### 3.8.2.1.1 Functional description

This new GUI is introduced under the submenu option MG9KEM Subnet view ->Performance. This GUI allows users to configure Sample and Summary intervals uniformly for all SN08 MG9Ks in a Subnet. If there are no MG9Ks in a subnet, the configured collection interval will just be stored in database.

Sample and Summary intervals are specified in terms of minutes. In SN08, the user is allowed to select following combinations of Sample and Summary intervals.

- Sample interval of 5 minutes and Summary interval of 30 minutes. This is shown as “5/30 minutes” in the GUI.
- Sample interval of 15 minutes and no Summary interval. This is shown as “15 minutes” in the GUI.

If there are mix of pre SN08 and SN08 MG9Ks in the subnet, then only the “15 minutes” is shown in the GUI.

If Collection intervals are not configured from the GUI “Configure Collection Interval”, they will have the default value “15 minutes”.

###### Impact on existing functionality of enabling/disabling of OM collection:

OM collection can be enabled for a MG9K through the “OMCollection” check box provided in the existing GUIs, “MG900 Provisioning”, “NE Properties”.

Refer to A00003531 CN for more details. In association with this existing capability of enabling OM collection, the GUI “Configure Collection Interval” affects OM collection as follows.

- When OMC is running, if OM collection is enabled for a MG9K, OMC will start collecting OM data at the Collection intervals.
- If collection interval is 5/30 minutes, the OMC checkbox is disabled for pre-SN08 NEs.

Impact on working of OMC and Performance Browser:

Whenever Collection intervals are changed, Performance browser and OM Collector behave as follows.

- OM Collector will start collecting OMs at new collection intervals, starting from next collection interval.
- After Collection interval is changed, if User tries to collect performance data, Performance browser will collect OMs at new Sample collection interval.

### 3.8.2.1.2 GUI usage and implications

None

### 3.8.2.1.3 GUI size

**Table 8 New or modified GUIs**

| Abbreviated GUI name          | Minimum instances | Maximum instances | Information on memory |
|-------------------------------|-------------------|-------------------|-----------------------|
| Configure Collection Interval | 1                 | 1                 | TBD                   |

### 3.8.2.1.4 GUI fields

The following table lists fields for GUI “Configure Collection Interval”.

**Table 9 GUI field descriptions**

| Field               | New or Changed | Subfield | Entry                                                                              | Explanation and action                                                                                                                                                                                                                                                                                                    | Associated MIB entry                                                                                                                                                          |
|---------------------|----------------|----------|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collection Interval | New            | None     | <ul style="list-style-type: none"> <li>5/30 minutes</li> <li>15 minutes</li> </ul> | <ul style="list-style-type: none"> <li>A value “5/30 minutes” specifies Sample and summary collection intervals of 5 and 30 minutes respectively.</li> <li>A value “15 minutes” specifies Sample and summary collection intervals of 15 minutes and none respectively.</li> <li>Default value is “15 minutes”.</li> </ul> | <p><u>MIB name:</u><br/>NORTEL-UEMG-BASE.mib</p> <p><u>Table name:</u> None</p> <p><u>Attributes:</u><br/>nnUemgOMStandardInterval and<br/>nnUemgOMExtendedIntervalMulti.</p> |

**3.8.2.1.5 Usage example**

The following example shows the GUI “Configure Collection Intervals“, when the value “5/30 minutes” is selected.

**3.8.2.1.6 GUI release history update**

A new GUI “Configure Collection Interval” is introduced in order to configure Sample and Summary intervals uniformly for all the MG9Ks in a Subnet.

### 3.8.2.1.7 Context sensitive launching information

None

### 3.8.2.1.8 Supplementary information

When MG9KEM changes Collection interval, any data collected by OM Collector and/or Performance browser till the end of current collection interval after MG9KEM changes collection intervals, may not be accurate. Following paragraphs explains the reason for this.

Example #1:

Let us consider that, MG9KEM changes the collection intervals say from 15 to 5/30 minutes, at 9:06 AM. In this scenario, MG9KEM and OM Collector will switch over starting from next collection interval time as explained below.

- OM Collector will collect new Sample interval (i.e, 5 min in this example) starting from 9:10 AM and Summary interval starting from 9:30 AM.

- Performance browser will changeover immediately. i.e, it will show Collection time period in terms of new Sample collection interval.

However, MG9K changes over to new collection interval at end of current collection interval (i.e., at 9:15 AM in the scenario explained above). Also, MG9K flushes its history performance data at 9:15 AM.

Because of this behavior difference between MG9K and MG9KEM PM components (i.e., performance browser and OM Collector), any data collected by OM Collector and/or Performance browser till and including 9:15 AM, may not be accurate.

Example #2:

Let us consider that, MG9KEM changes the collection intervals say from 5/30 to 15 minutes, at 9:06 AM. In this scenario, MG9KEM and OM Collector will switch over starting from next collection interval time as explained below.

- OM Collector will collect new Sample interval (i.e, 15 min in this example) starting from 9:15 AM.

- Performance browser will changeover immediately. i.e, it will show Collection time period in terms of new Sample collection interval.

However, MG9K changes over to new collection interval at end of current collection interval (i.e., at 9:10 AM in the scenario explained above). Also, MG9K flushes its history performance data at 9:10 AM.

Because of this behavior difference between MG9K and MG9KEM PM components (i.e., performance browser and OM Collector), any data collected

by OM Collector and/or Performance browser till and including 9:15 AM, may not be accurate.

### 3.8.2.2 GUI name: Performance Statistics Browser

#### 3.8.2.2.1 Functional description

Two date range fields “From” and “To” are shown on Performance browser. Today, these two fields show date either in steps of 15 minutes or in steps of 1 day. Apart from 15 minutes and 1 day, in SN08, these two fields show date in steps of 5 minutes also.

#### 3.8.2.2.2 GUI usage and implications

None

#### 3.8.2.2.3 GUI size

**Table 10 New or modified GUIs**

| Abbreviated GUI name           | Minimum instances | Maximum instances       | Information on memory |
|--------------------------------|-------------------|-------------------------|-----------------------|
| Performance Statistics Browser | 1                 | One per GUI workstation | No change             |

#### 3.8.2.2.4 GUI fields

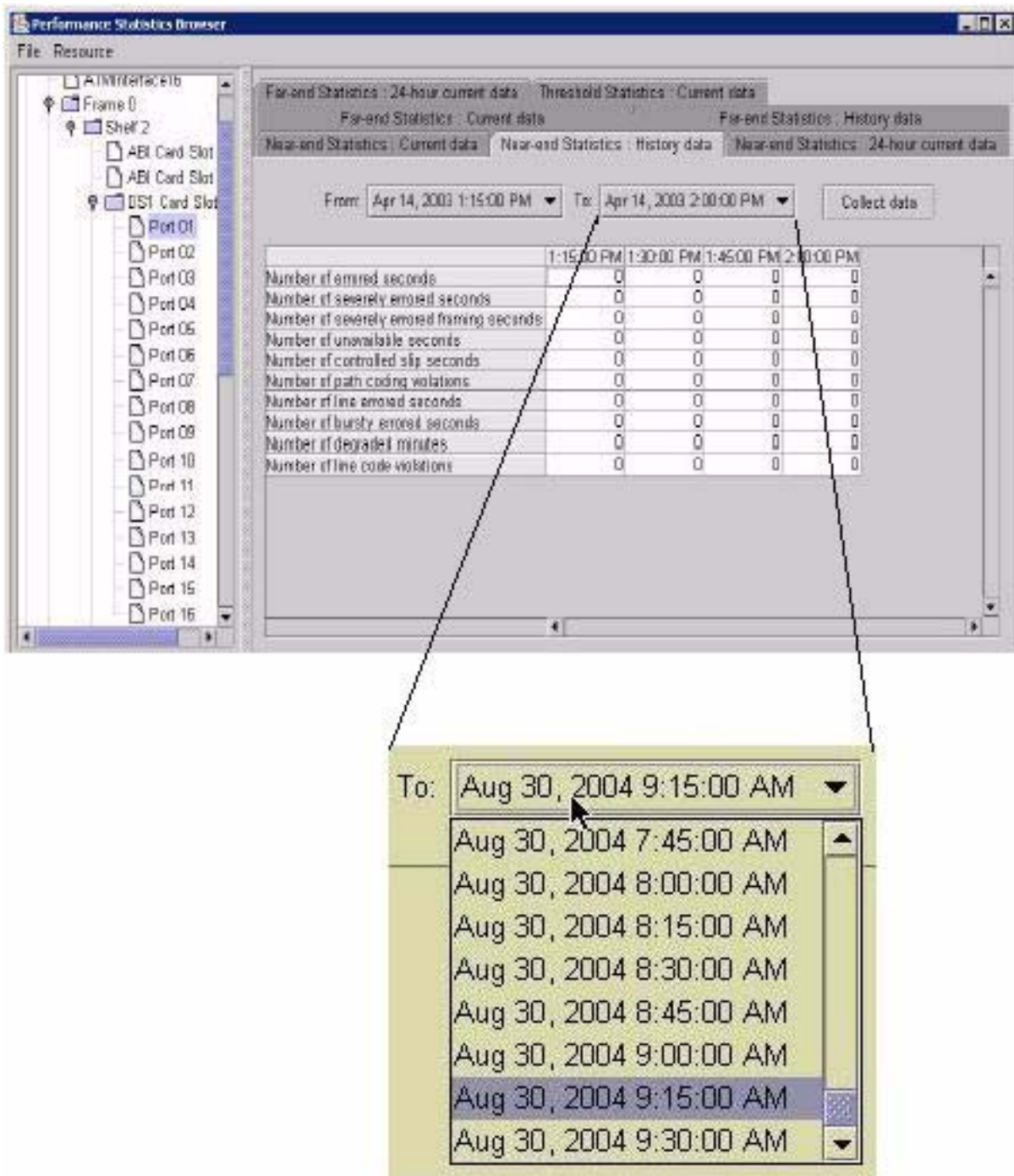
The following table lists fields for GUI “Configure Collection Intervals”.

**Table 11 GUI field descriptions**

| Field | New or Changed | Subfield | Entry                                    | Explanation and action                                                                                           | Associated MIB entry |
|-------|----------------|----------|------------------------------------------|------------------------------------------------------------------------------------------------------------------|----------------------|
| From  | Changed        | NA       | Data ranges are based on Sample interval | Date range shown corresponds to last 96 sample intervals. Size of each interval is equal to the Sample interval. | None                 |
| To    | Changed        | NA       | Data ranges are based on Sample interval | Date range shown corresponds to 96 sample intervals. Size of each interval is equal to the Sample interval.      | None                 |

#### 3.8.2.2.5 Usage example

The following example shows the GUI “Configure Collection Interval“, when the value “15 minutes” is selected.



### 3.8.2.2.6 GUI release history update

The date range fields present in Performance browser are based on the sample interval.



**3.8.2.2.7 Context sensitive launching information**

None

**3.8.2.2.8 Supplementary information**

None

**3.8.3 CLUI Interface**

NA

**3.9 User interface changes**

NA

**3.10 OSSGate Interface Changes**

None

**3.11 Security**

NA

**3.11.1 Authentication**

The new GUI “**Configure Collection Interval**” has an authorization level of “**emsrw**”.

**3.12 Configuration Walkthrough**

None

**3.13 Reference**

[1] A00007213 FN

[2] A00007107 FN

[3] A00003531 CN

**4: Performance Management for A00007213****4.1 Performance management strategy**

In SN08, OM Collector is integrated with MG9KEM server. So, OM Collector is started, stopped and configured along with MG9KEM server.

Today, there is considerable latency between the time OM data is generated at GW and the time it is available at north-bound interfaces of MG9KEM. In order to reduce this latency, OM Collector sends a CORBA notification when it generates CSV files. It also sends a CORBA notification when it fails to generate CSV files. Note that, these notification are raised one per MG9K per collection interval.

OM Collector raise a minor alarm when it fail to collect OM file from MG9K and clears the alarm when it could again collect OM file from MG9K. Note that these alarms are generated one per MG9K per collection interval.

## 4.2 Performance management tools and utilities

Following are the two configurations which are related to OM data.

- Enabling/disabling OM collection for a MG9K: OM collection can be enabled for a MG9K through a check box provided in the existing GUIs, “MG900 Provisioning”, “NE Properties”. OM collector collects OM data for a MG9K, if OM collection is enabled. Refer to A00003531 CN for more details.
- Configuration of Collection intervals: This is done through the GUI “Configure Collection Interval”.

When OMC is running, if OM collection is enabled for a MG9K, OMC will start collecting OM data at the Collection intervals.

### Impact of “Configuration of Collection Interval”:

Whenever Collection intervals are changed, Performance browser and OM Collector behave as follows.

- OM Collector will start collecting OMs at new collection intervals, starting from next collection interval.
- After Collection interval is changed, if User tries to collect performance data, Performance browser will collect OMs at new Sample collection interval.

When MG9KEM changes Collection interval, any data collected by OM Collector and/or Performance browser till the end of current collection interval after MG9KEM changes collection intervals, may not be accurate. Refer to section 12.4.2.1.8 in A00007213 CN for more details.

### 4.2.1 OM Collector configuration scripts

OM Collector is integrated with MG9KEM server. So, OM Collector is started, stopped and configured along with MG9KEM server. Following is CLUI changes;

- The scripts which were present under the directory /opt/nortel/omcltr\_07/bin/ are no more available in SN08. Instead, user need to use the scripts available under the directory /opt/nortel/mg9ksrv\_08/bin for the same purpose.
- Directory for CSV file is configurable. It can be configured through one of the scripts, “/opt/nortel/mg9ksrv\_08/bin/mg9kconfig.sh”,

“/opt/nortel/mg9ksrv\_08/bin/mg9kserver config”. Note that, the default CSV collection directory /data/oms/1 is registered for rotation. However, OMC does not do this registration. If CSV collection directory is configured to directory other than /data/oms/1, User of OMC has to register the CSV collection directory for rotation. In SN08, this capability is intended to be used for designer testing.

## **4.3 Performance Measurements (PM), Operational Measurements (OM), and stats**

### **4.3.1 PM, OM, and stats format**

In SN08, following information elements are changed,

- Collection Interval: Periodic collection interval may be configured to a combination of Sample and Summary intervals. In SN08, “5/30 Minutes” and “15 Minutes” are supported.
- OSS delivery (and interface) or Local only: OM Collector sends appropriate CORBA notification whenever it succeeds or fails to generate CSV file
- OSS Collection Interval: As and when CSV file is generated, OM Collector sends a CORBA notification. OSS can use appropriate mechanism to collect CSV file as and when it receives this notification.
- File Name: Directory wherein CSV are generated, are configurable in SN08.

### **4.3.2 Performance File (CSV, SSV, XML) Format**

There is no change in SN08.

### **4.3.3 OM Group template (applies only to DMS)**

NA





# SN08 Feature Deltas

***Product = MG 9000***

## **A00007263--LCI for Gigabit Ethernet**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

This feature will make the necessary modifications to the LCI software to support the new Gigabit Ethernet Network Interface for MG9K.

The LCI modifications (without affecting the existing functionalities of the SCO/SCI cards) for the new SCG (Super Core GigabitEthernet) card are as follows:

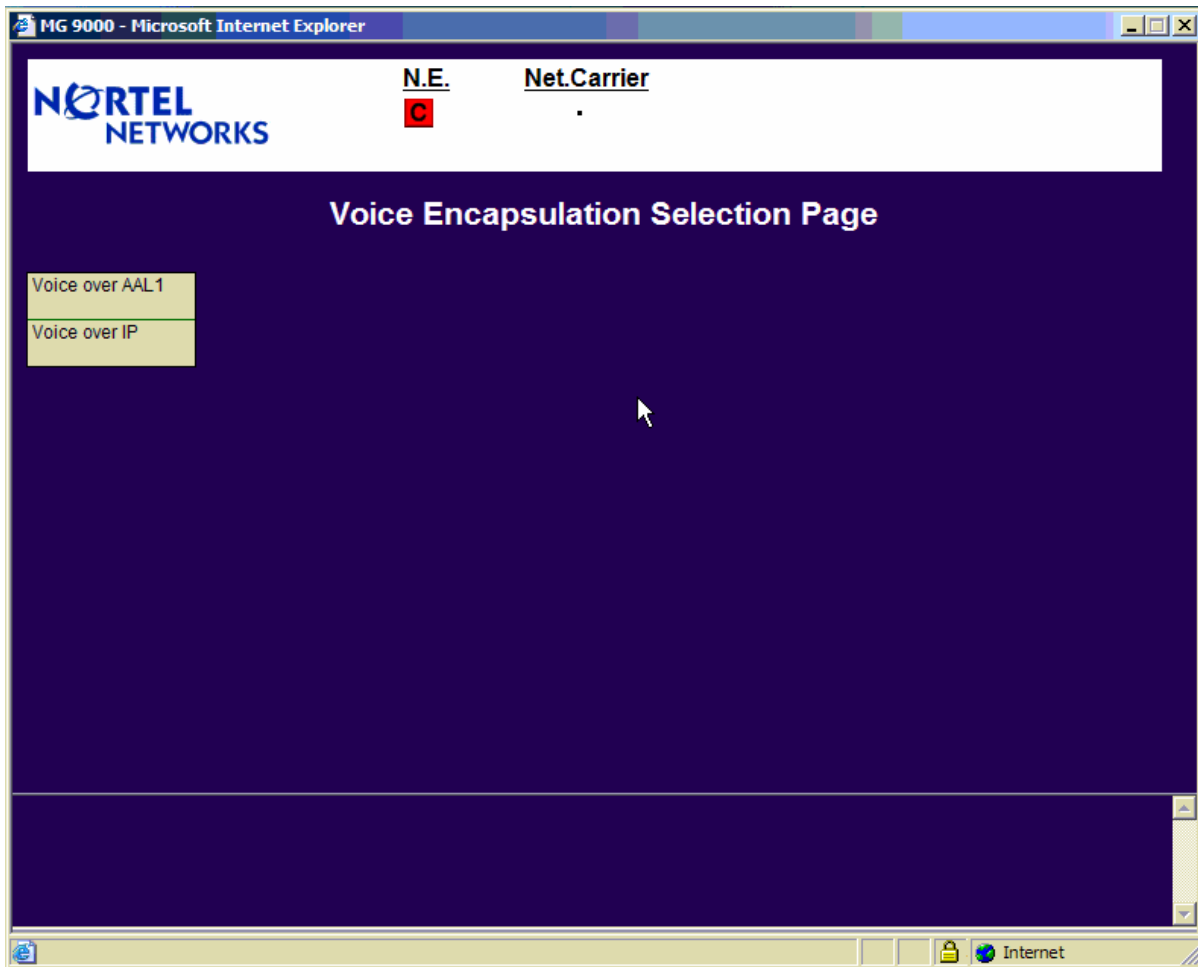
- 1** Card maintenance of the SCG card – which would be same as the existing SCO/SCI cards' Card-Maintenance
- 2** Carrier maintenance – where the new GigE link can be:
  - Provisioned – also includes the ability to request for auto-negotiation
  - Controlled – the admin and config state of the links can be controlled
  - Status can be viewed – the alarm(s) on the links will be displayed
  - Perform OOS (Out of Service) test and monitor Link-Integrity
  - Have Link Protection – to be able to set the working (preferred) and non-working (non-preferred) links and also enable/disable link-reversion

- 3 Connection side changes -- VLAN – to be able to provision (set the VLAN ids.), shape (set the peak rate) and also prioritize the different types of VLANs (OAMP, Bearer, Call-Control and for the fixed IP addresses of the SCG cards) from the connections button on the LCI.
- 4 Miscellaneous –
  - Dynamic updating of the alarm severities at the N.E and Net.Carrier links on LCI.
  - Update the following terms as applicable to GigE:
    - ‘Carrier’ will be changed to ‘Link’
    - ‘APS’ will be changed to ‘Protection’
    - ‘Net.Carrier’ will be changed to ‘Net.Link’

**Note:** The following sub-sections explain the above modifications. Most of them contain screen-shots that are self-explanatory. Texts are added to explain the screens wherever necessary. They are not in any particular order.

### 1.2.1 Solution type selection

Since the SCO/SCI had support for both VoAAL1 and VoIP, the solution type selection was required when we login to LCI. Now, for SCG, it goes directly into VoIP as this is the only solution type supported on SCG cards. So the following screen will not appear in LCI for SCG cards.

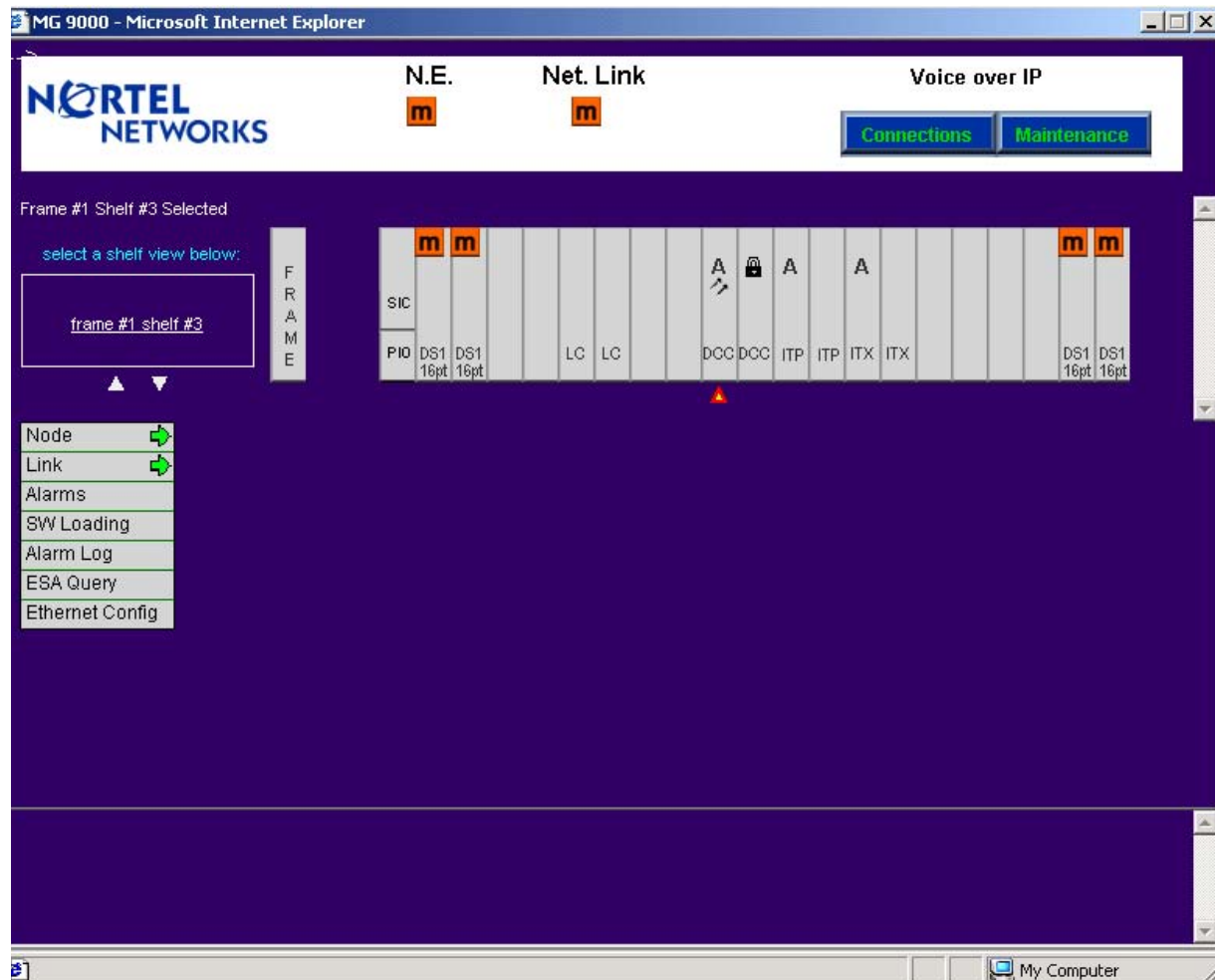


### 1.2.2 Change the terms

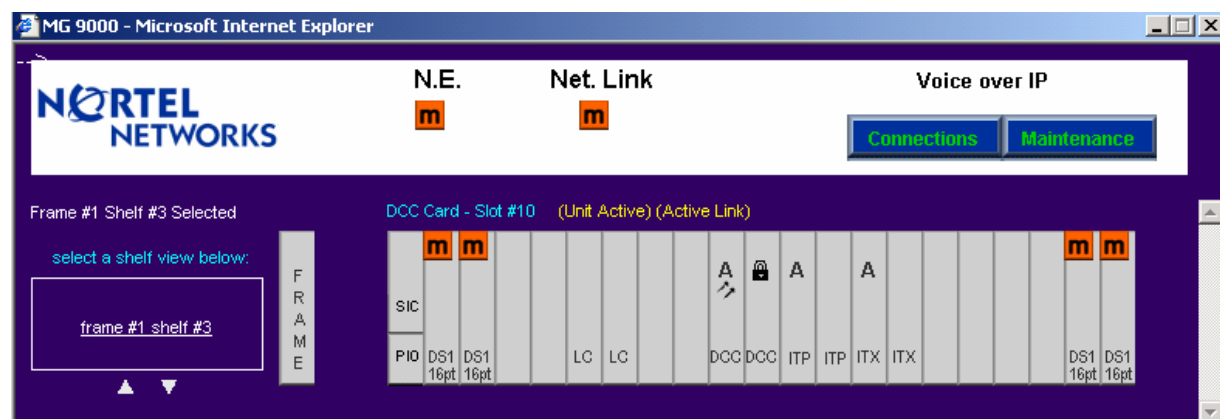
The term 'Net. Carrier' applies to SONET & SDH for SCO/SCI cards. But for SCG cards, this will be changed to 'Net. Link' as shown in the screen below:



The menu items when you click on the DCC card will contain 'Link' instead of 'Carrier' as shown in the screen below:

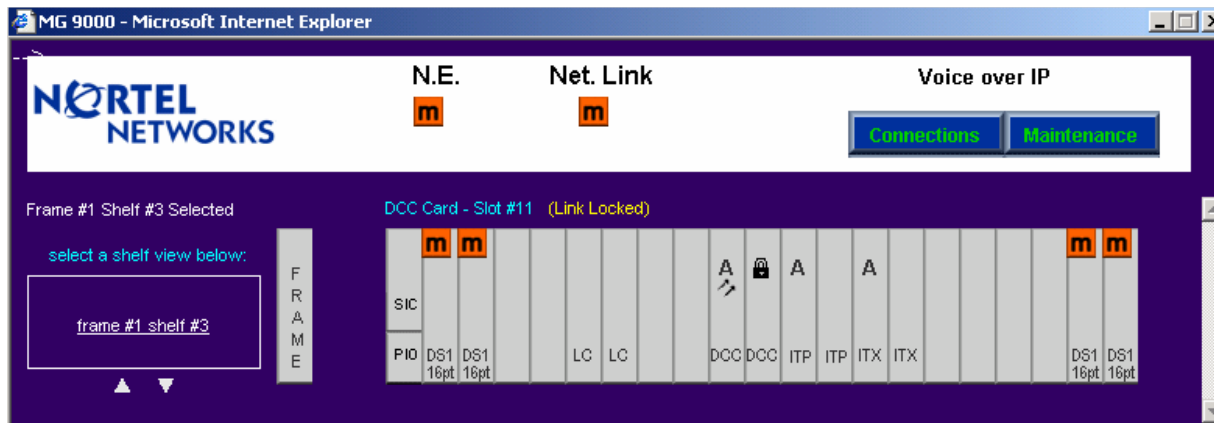


When the mouse is moved over the DCC card, the text that displays the information in yellow displays 'Active Link' instead of 'Active Carm.' as shown in the screen below.

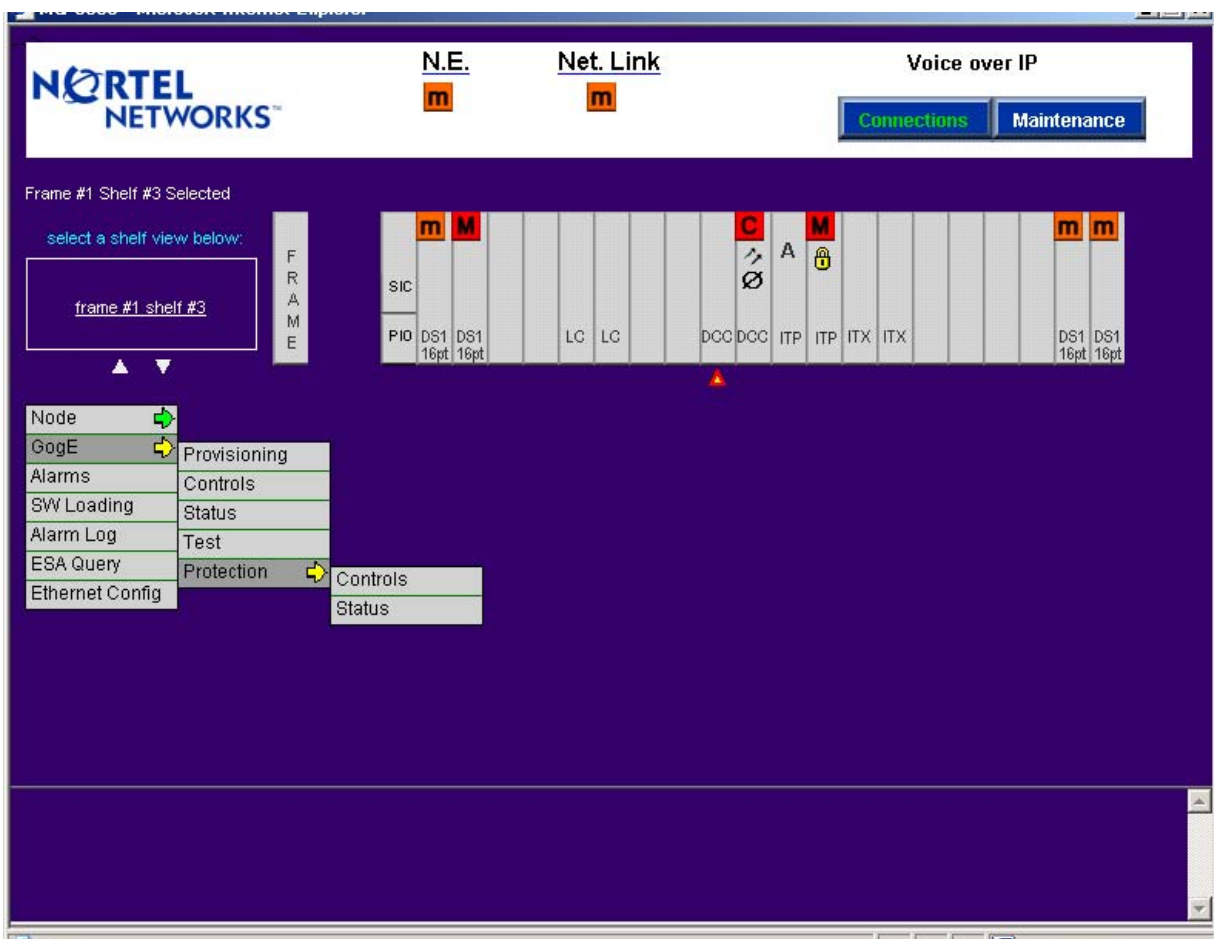




When the link is locked a lock symbol is displayed on the DCC card and when the mouse is pointed on the card, the text 'Link locked' is displayed instead of 'Carm. Locked' as shown in the screen below:



The sub-menu option 'APS' under 'Carrier' on the DCC card will be changed to 'Protection' as shown in the screen below:



### 1.2.3 GigE Provisioning

The GigE provisioning screen will be as shown below. More details on each of the fields will be provided in the DSUM document.

MG 9000 - Microsoft Internet Explorer

Nortel Networks

N.E. Net. Link Voice over IP

Connections Maintenance

Frame #1 Shelf #3 Selected

select a shelf view below:

frame #1 shelf #3

FRAME

SIC

PIO DS1 16pt DS1 16pt LC LC DCC DCC ITP ITP ITX ITX DS1 16pt DS1 16pt

GigE Provisioning for Slot #10

Select Port No. ▾

| Auto-negotiation | Duplex | Speed | Flow Control | Pause Tx | Pause Rx | Pause Rx override | Pause Control | MTU size | Auto-neg Status | Tx RFI | Rx RFI |
|------------------|--------|-------|--------------|----------|----------|-------------------|---------------|----------|-----------------|--------|--------|
|                  |        |       |              |          |          |                   |               |          |                 |        |        |

Local Adv. Values

| Duplex | Speed | Flow Control |
|--------|-------|--------------|
|        |       |              |

Partner Adv. Values

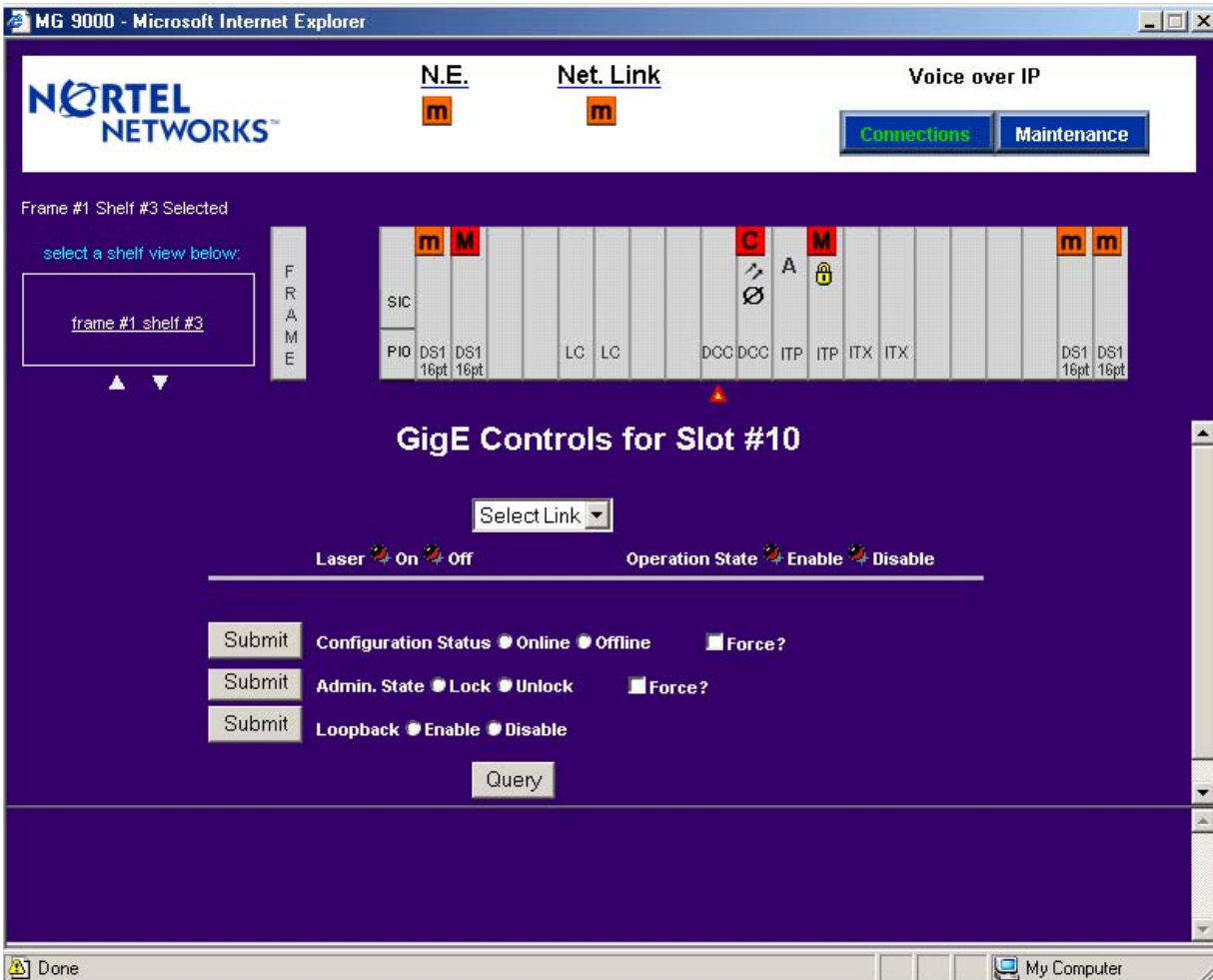
| Auto Signaling | Duplex | Speed | Flow Control |
|----------------|--------|-------|--------------|
|                |        |       |              |

Request Auto-Negotiation

Submit Query

Done My Computer

## 1.2.4 GigE Controls



## 1.2.5 GigE Status

This page lists the alarms for GigE Links as shown below:

MG 9000 - Microsoft Internet Explorer

NORTEL NETWORKS™

N.E. Net. Link Voice over IP

Connections Maintenance

Frame #1 Shelf #3 Selected

select a shelf view below:

frame #1 shelf #3

querying status...

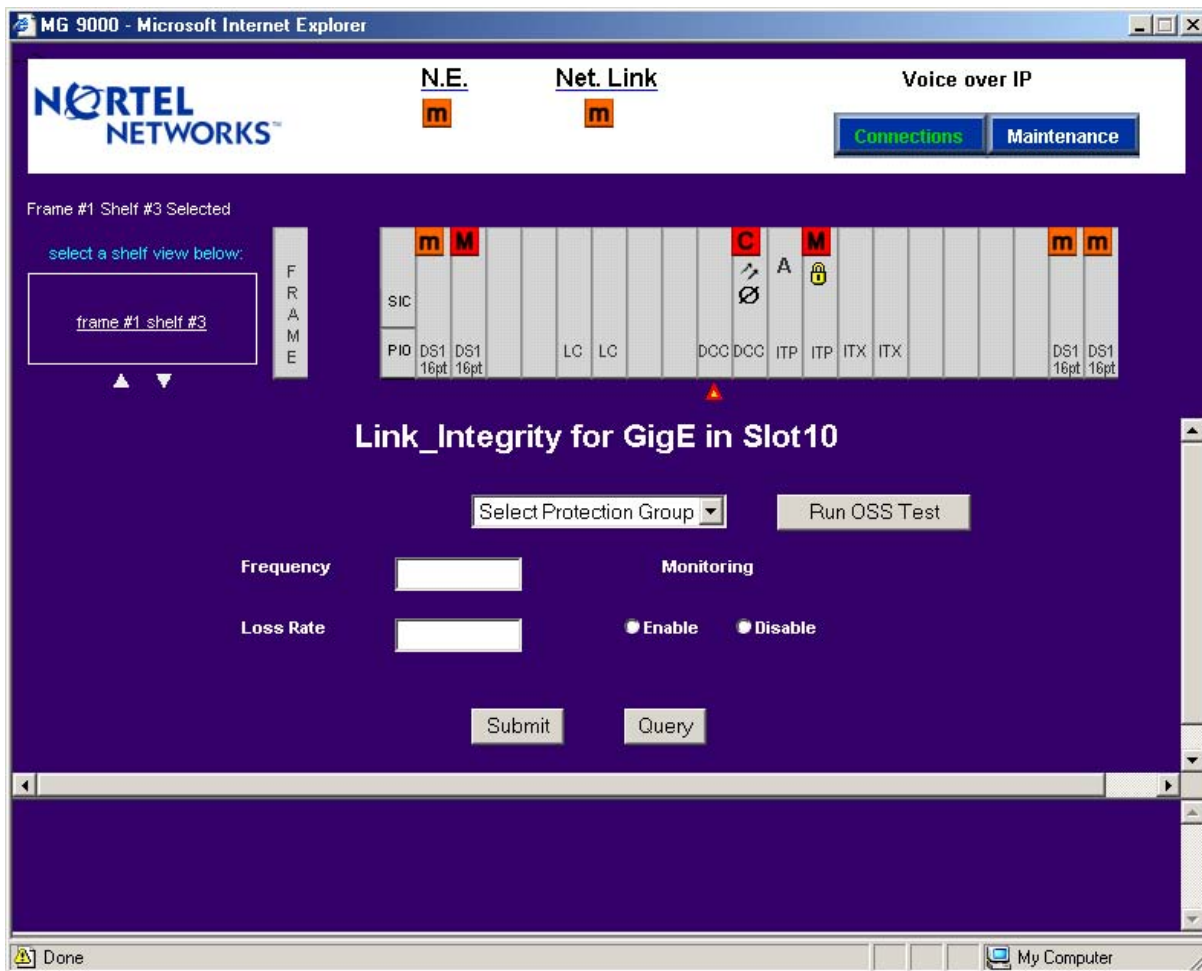
### GigE Status for Slot #10

| GigE#  | Oper State | Admin State | Loopback | LOS | RFI | TX | AUTONE | RxER | LINT | OPT | OPR | GARP | LKINT | TEM | POW | RxSD | TBC |
|--------|------------|-------------|----------|-----|-----|----|--------|------|------|-----|-----|------|-------|-----|-----|------|-----|
| GIGE 0 | Up         | Unlocked    | NoLpbk   | ■   | ▲   |    | ■      |      | ■    | ▲   |     | ■    |       | ■   | ▲   |      | ■   |
| GIGE 1 | Up         | Unlocked    | NoLpbk   | ■   | ▲   |    | ■      |      | ■    | ▲   |     | ■    |       | ■   | ▲   |      | ■   |
| GIGE 2 | Up         | Unlocked    | NoLpbk   | ■   | ▲   |    | ■      |      | ■    | ▲   |     | ■    |       | ■   | ▲   |      | ■   |
| GIGE 3 | Up         | Unlocked    | NoLpbk   | ■   | ▲   |    | ■      |      | ■    | ▲   |     | ■    |       | ■   | ▲   |      | ■   |

Done My Computer

### 1.2.6 2.2.6GigE Test

The GigE Test page that is used for running the OOS test as well as to monitor link-integrity looks as below:



First the user needs to select the Protection-Group (which would have been configured in the protection-controls page).

Then, for the selected protection group the following can be done:

- Run the OOS test by clicking on the “Run OOS Test” button. After the test, the result will be displayed to the user.
- Setting the frequency, loss-rate and the Monitoring enable/disable by clicking on the SUBMIT button.
- Read the values previously set for the fields Frequency, Loss-rate and Monitoring Enabled/Disabled by clicking on the QUERY button. Note that this will not be able to get the result of the OOS Test.

### 1.2.7 GigE Protection

The GigE Protection contains 2 sub-menus - Controls and Status.

The Controls screen looks as below:

MG 9000 - Microsoft Internet Explorer

NORTEL NETWORKS™

N.E. Net. Link Voice over IP

Connections Maintenance

Frame #1 Shelf #3 Selected

select a shelf view below:

frame #1 shelf #3

FRAME

| SIC | PID | DS1 16pt | DS1 16pt | LC | LC | DCC | DCC | ITP | ITP | ITX | ITX | DS1 16pt | DS1 16pt |
|-----|-----|----------|----------|----|----|-----|-----|-----|-----|-----|-----|----------|----------|
|     |     | m        | M        |    |    | C   | A   | M   |     |     |     | m        | m        |
|     |     |          |          |    |    |     |     |     |     |     |     |          |          |

Link\_Protection control for GigE in Slot10

Group No.

Group Type

Working link

Protection link

Link reversion ☐ Enable ☐ Disable

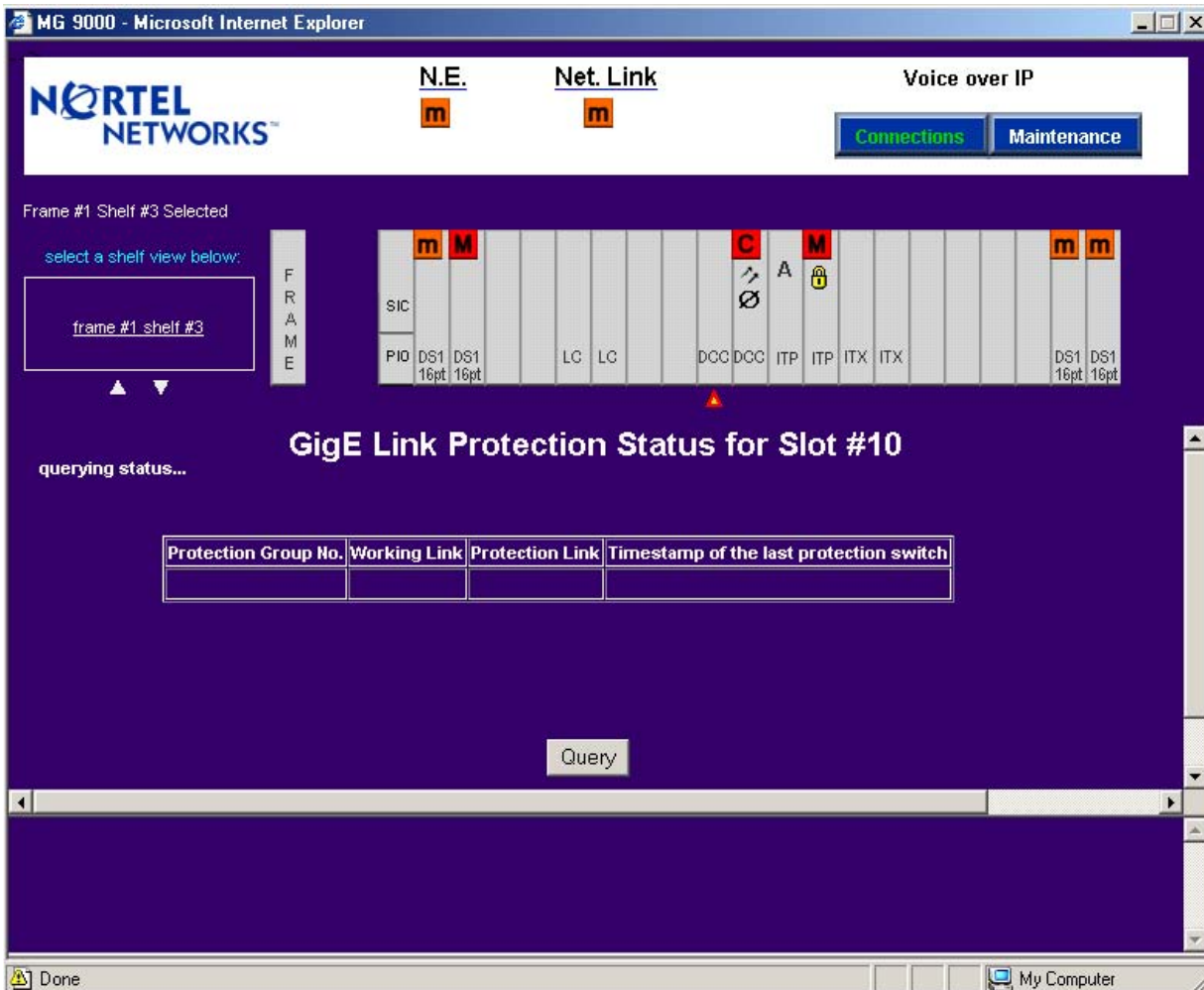
Wait To Restore

Submit Query

Done My Computer

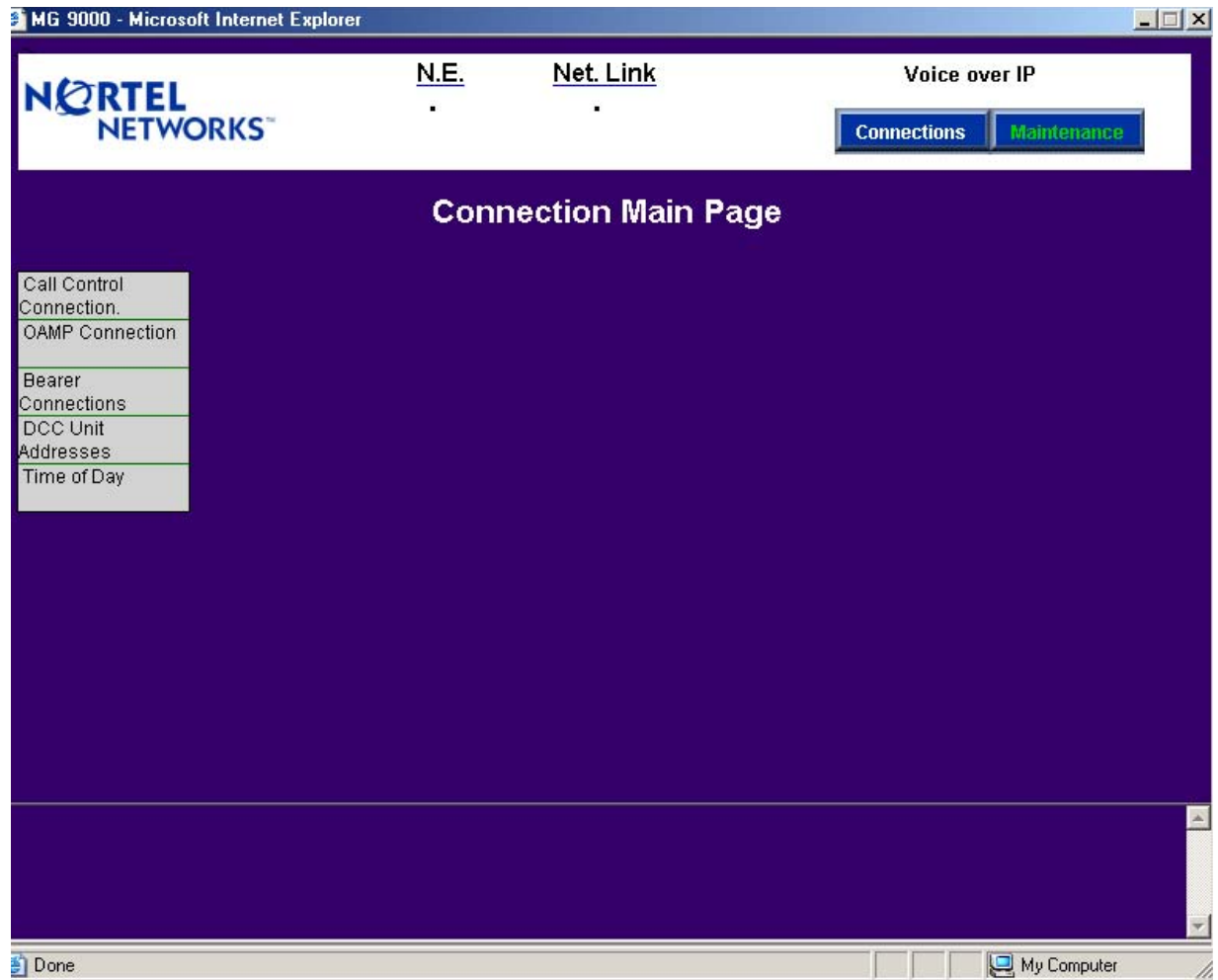


The Status screen looks as below:



### 1.2.8 VLAN

The Connections menu will be changed to the following options as shown in the screen below:





The Call Control screen will look as below:

The screenshot shows a web browser window titled "MG 9000 - Microsoft Internet Explorer". The page has a blue header with the Nortel Networks logo on the left. In the center of the header are the labels "N.E." and "Net. Link", each followed by a period. On the right of the header is the text "Voice over IP" and two buttons: "Connections" and "Maintenance". The main content area has a blue background and is titled "Call Control Connection". It contains a form with the following fields and labels:

|                            |                      |                |                      |
|----------------------------|----------------------|----------------|----------------------|
| Default Gateway (optional) | <input type="text"/> | VLAN ID        | <input type="text"/> |
| Heartbeat Ping IP          | <input type="text"/> | VLAN Peak rate | <input type="text"/> |
| Call Control IP            | <input type="text"/> | VLAN Priority  | <input type="text"/> |
| Subnet Mask                | <input type="text"/> |                |                      |

Below the form are two buttons: "Submit" and "Query". The browser's status bar at the bottom shows "Done" and "My Computer".

The OAMP Connection screen will look as below:

MG 9000 - Microsoft Internet Explorer

**NORTEL NETWORKS™**

[N.E.](#)   [Net. Link](#)

Voice over IP

[Connections](#)   [Maintenance](#)

### OAMP Connection

|                                       |                      |                                    |                      |
|---------------------------------------|----------------------|------------------------------------|----------------------|
| Default Gateway (optional)            | <input type="text"/> | VLAN ID                            | <input type="text"/> |
| Heartbeat Ping IP                     | <input type="text"/> | VLAN Peak rate                     | <input type="text"/> |
| Active OAMP IP                        | <input type="text"/> | VLAN Priority                      | <input type="text"/> |
| Inactive OAMP IP                      | <input type="text"/> |                                    |                      |
| IP Address of MG 9000 Element Manager | <input type="text"/> | IP Port of MG 9000 Element Manager | <input type="text"/> |
| OM Collector Server IP (optional)     | <input type="text"/> |                                    |                      |
| Subnet Mask                           | <input type="text"/> |                                    |                      |

[Submit](#)   [Query](#)

Done   My Computer

The Bearer Connection screen will look as below:

The screenshot shows a web browser window titled "MG 9000 - Microsoft Internet Explorer". The page header includes the Nortel Networks logo, navigation links for "N.E." and "Net. Link", and a "Voice over IP" section with "Connections" and "Maintenance" buttons. The main content area, titled "Bearer Connection", contains a form with the following fields:

|                            |                      |                |                      |
|----------------------------|----------------------|----------------|----------------------|
| Default Gateway (optional) | <input type="text"/> | VLAN ID        | <input type="text"/> |
| Heartbeat Ping IP          | <input type="text"/> | VLAN Peak rate | <input type="text"/> |
| Bearer IP                  | <input type="text"/> | VLAN Priority  | <input type="text"/> |
| Subnet Mask                | <input type="text"/> |                |                      |

At the bottom of the form are "Submit" and "Query" buttons. The browser's status bar at the bottom shows "Done" and "My Computer".

The DCC Unit Addresses screen will look as below:

The screenshot shows a web browser window titled "MG 9000 - Microsoft Internet Explorer". The page has a dark blue header with the Nortel Networks logo on the left. In the center of the header are two links: "N.E." and "Net. Link", each with a small orange square icon below it. On the right of the header is the text "Voice over IP" above two buttons: "Connections" and "Maintenance". The main content area has a dark blue background with the title "DCC Unit Addresses" in white. Below the title, there are two columns of input fields. The left column contains: "Slot10 IP Address", "Slot10 Subnet Mask", "Slot11 IP Address", and "Slot11 Subnet Mask". The right column contains: "VLAN ID", "VLAN Peak rate", and "VLAN Priority" (which is a dropdown menu). At the bottom of the form area are two buttons: "Submit" and "Query". The browser's status bar at the bottom shows "Done" on the left and "My Computer" on the right.

### 1.3 Hardware Requirements or Dependencies

There will be a new SCG card that replaces the SCO/SCI cards on the DCC slots of the MG9K to provide GigE network interface.

The existing standard LCI setup holds true to support this feature – Windows-based-PC or Sun-workstation to connect to the SCG card on the MG9K

### 1.4 Software Requirements or Dependencies

Currently supported browsers will be supported for this feature too: Netscape 7+ on Win2K, Internet Explorer 5.5+, Netscape 4.7+ on Solaris/HPUX

### 1.5 Limitations and restrictions

No new limitations/restrictions will be imposed on LCI as a result of this feature.

## 1.6 Interactions

LCI subsystem will interact with other gateway subsystems as it currently does in the existing architecture. The LCI client to server interaction will also be the same way as it currently exists.

## 1.7 Glossary

AAL1 – ATM Adaptation Layer

ABI – Access Bridge Interface

APS – Automatic Protection Switching

ATM – Asynchronous Transfer Mode

BDP – Business Decision Point

BITS – Building Integrated Timing Supply

CAF - Content Access Form

ClockSync – Clock Synchronization

DCC – Data Control Card

DID – Design Intent Document

DS1 – Digital Signal level 1

GigE – Gigabit Ethernet

HAL – Hardware Abstraction Layer

ICAF –Integrated CAF

IMA – Inverse Multiplexing over ATM

IP – Internet Protocol

ITP – Internet Telephony Processor

ITX – Internet Telephony Extender

LAN – Local Area Network

LCI – Local Craft Interface

MG9K – Media Gateway 9000

MTU – Max Transfer Unit

OAMP – Operation, Administration, Maintenance, Performance

PING – IP Tool/Utility used to find out if a network host is alive or not

POR – Plan of Record

Ref/Sig – Reference/Signal

RFI – Remote Fault Indicator

Rx - Receiver

SC – Super Core

SCG – Super Core GigE

SCI – Super Core IMA

SCO – Super Core OC3

SN08 – Succession Networks Release 08

SSU – Synchronization Supply Unit

TRACEROUTE – IP Tool/Utility used to print the route a packet takes to the network host

Tx - Transmission

VLAN – Virtual LAN

VOIP – Voice over IP



# SN08 Feature Deltas

***Product = MG 9000***

## **A00007293--VLAN for Gigabit Ethernet**

### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

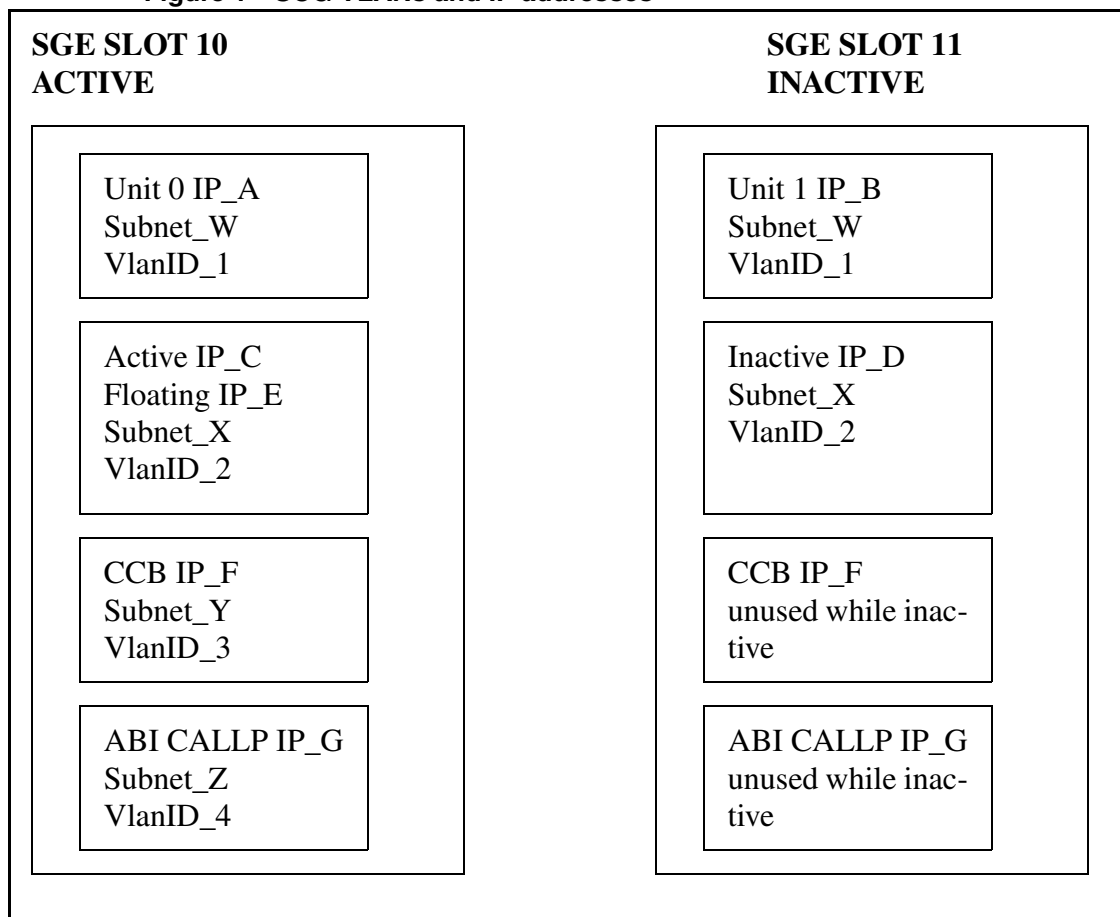
#### **1.2 Description**

On a GigE MG9K, VLANs are used to aggregate similar IP traffic. There are four VLANs configured on the MG9K via the LCI. The four VLANs are OAM, CallControl, Bearer, and Unit. The OAM VLAN is used for SNMP, loading, ssh, etc. The CallControl VLAN is used by ITPs and ABIs for H.248 and XPM messaging. The Bearer VLAN carries all ITP and ABI bearer traffic. The Unit VLAN is used to perform GigE link integrity tests to the edge router and the mate SCG card.

In addition there are five new IP addresses required on a GigE MG9K. They are

- two static unit addresses that are assigned to a SCG card
- one floating SCG Call Control address used for ARP
- one floating SCG Bearer address used for ARP
- one floating inactive OAM address.

The figure below illustrates the relationship of the VLANs and IP addresses described above.

**Figure 1 SCG VLANs and IP addresses****1.3 Hardware Requirements or Dependencies**

Not Applicable.

**1.4 Software Requirements or Dependencies**

Not Applicable.

**1.5 Limitations and restrictions**

Not Applicable.

**1.6 Interactions**

Not Applicable.

**1.7 Glossary**

| Term     | Description    |
|----------|----------------|
| New term | Definition     |
| SCG      | Supercore GigE |

**2: Configuration for A00007293**



## 2.1 Data schema (DS) (CM, MIBS, RDB)

### 2.1.1 New/modified tables, MIBs, or Database Schema

Table 1 New or modified tables

| Table/MIB name   | NEW/CHANGED/ or DELETED/ | Table Control (NEW/ OLD/UNCHANGED) |
|------------------|--------------------------|------------------------------------|
| nnGLinkVlanTable | NEW                      | n/a                                |

### 2.1.2 Table/MIB/Remote Database Schema information

#### 2.1.2.1 Name: nnGLinkVlanTable

##### 2.1.2.1.1 Functional description

MIB table nnGLinkVlanTable is used to create, modify, and delete VLANs on the MG9K. There is one entry for each VLAN. The table is indexed by a unique VLAN ID defined by the user.

##### 2.1.2.1.2 Fields/OIDs

The following table lists fields/OIDs for an entry in the nnGLinkVlanTable.

Table 4: VLAN Entry

| Field           | Type             | Description                                             |
|-----------------|------------------|---------------------------------------------------------|
| nnGLinkVlanId   | INTEGER          | Index into the VLAN table.                              |
| nnGLinkVlanName | SnmpAdmin-String | 20 character string                                     |
| nnGLinkVlanType | INTEGER          | byPort or byIpSubnet; in SN08 all VLANs are byIpSubnet. |

| Field                          | Type                  | Description                                                                                               |
|--------------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------|
| nnGLinkVLanPortMember1         | InterfaceIndex-OrZero | IfIndex of a port associated with this VLAN. A value of 0 indicates no port association with this member. |
| nnGLinkVLanPortMember2         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPortMember3         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPortMember4         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPortMember5         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPortMember6         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPortMember7         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPortMember8         | InterfaceIndex-OrZero |                                                                                                           |
| nnGLinkVLanPrimarySubnetAddr   | IpAddress             | The SCG IP address for this VLAN.                                                                         |
| nnGLinkVLanPrimarySubnetMask   | IpAddress             | Corresponding primary subnet mask for the primary IP address.                                             |
| nnGLinkVLanSecondarySubnetAddr | IpAddress             | This is provided for extensibility purposes.                                                              |
| nnGLinkVLanSecondarySubnetMask | IpAddress             | This is provided for extensibility purposes.                                                              |
| nnGLinkVLanUserPriority        | INTEGER               | Specified VLAN priority as defined in 802.1 Q; range is 0 - 7.                                            |
| nnGLinkVLanPeakRate            | Unsigned32            | Peak rate at which the packets on this VLAN will be sent to the destination port.                         |
| nnGLinkVLanRowStatus           | RowStatus             |                                                                                                           |

### 3: Performance for A00007293

### 3.1 Performance management strategy

The MG9K Element Manager provides access to per VLAN statistics. The statistics may be queried for their current value or on a historical basis. This data may be used to identify high traffic periods or used for troubleshooting purposes to verify packet transmission/reception during a specific time period.

### 3.2 Performance management tools and utilities

Access to the OMs is provided using the Performance Statistics Browser on the MG9K EM.

### 3.3 Performance Measurements (PM), Operational Measurements (OM), and stats

New OMs available on a per VLAN basis are listed below. These may be obtained from the SMON MIB table smonVlanIdStatsTable.

- smonVlanIdStatsTotalPkts - total incoming packets
- smonVlanIdStatsTotalHCPkts - total outgoing packets
- smonVlanIdStatsTotalOctets - total incoming octets
- smonVlanIdStatsTotalHCOctets - total outgoing octets

#### 3.3.1 PM, OM, and stats format

**Table 5: VLAN OMs**

| Field                        | Syntax    | Unit        |
|------------------------------|-----------|-------------|
| smonVlanIdStatsTotalPkts     | Counter32 | Total Count |
| smonVlanIdStatsTotalHCPkts   | Counter32 | Total Count |
| smonVlanIdStatsTotalOctets   | Counter32 | Total Count |
| smonVlanIdStatsTotalHCOctets | Counter32 | Total Count |

## ***Product = MG 9000***

### **A00007415--MG9K EM Internodal ESA**

#### ***Functional Description***

#### **1.1 Applicable Solution(s)**

UA-IP

#### **1.2 Description**

Inter Nodal ESA will provide the ability to make calls while in ESA between MG9K nodes. In doing so, the Telco's will also be provided the ability to provision a "Community of Interest" which defines which MG9K nodes can make ESA calls between one another. A community must have access to a LAN Switch (i.e. Passport 15K or equivalent) in order for Inter Nodal ESA calls to complete.

If an MG9K does not have access to a LAN Switch, it will operate in the pre-SN08 manner of routing calls between VMGs within a single MG9K node. Also, although a Community of Interest is defined, each node must be in ESA for it to participate in the community. Nodes are not forced to enter ESA.

The current implementation of ESA only allows calls between Virtual Media Gateways (VMG) within the same MG9K node. This feature will expand ESA's ability to make calls between a limited number of MG9K nodes termed a "Community of Interest". However, as with previous ESA releases, calls can only be made between VMGs that are in ESA.

#### **1.3 Hardware Requirements or Dependencies**

This feature will apply to all supported hardware platforms, per SN08 succession server platform foundation software specification.

#### **1.4 Software Requirements or Dependencies**

This MG9K EM feature is dependent on the corresponding SN08 MG9K feature for internodal ESA - A00006894.

#### **1.5 Limitations and restrictions**

- Up to 32 communities of interest are supported.
- Each community can contain up to 15 nodes.
- A given node can only belong in one community.

## 1.6 Interactions

N/A

## 1.7 Applicable Customer Facing Sections

### Fault Management

Logs \_\_\_\_\_

Alarms   X  

### Configuration

Data Schema   X  

User Interface   X  

Element Manager   X  

Security \_\_\_\_\_

Service Order \_\_\_\_\_

Office Parameters \_\_\_\_\_

Accounting (Includes AMA billing) \_\_\_\_\_

Performance (Includes OMs) \_\_\_\_\_

## 1.8 Glossary

| Term | Description             |
|------|-------------------------|
| EM   | Element Manager         |
| COI  | Community of Interest   |
| ESA  | Emergency Standalone    |
| VMG  | Virtual Media Gateway   |
| PVR  | Passport Virtual Router |
| MG9K | Media Gateway 9000      |

## 2: Fault Management for A00007415

### 2.1 Fault management strategy

The standard MG9k EM Fault Management strategy will apply to the faults for MG9kEM Internodal ESA. Alarms will be displayed by the MG9K EM Alarm

Browser, logged in NT standard format to the SSPFS CUST logs, and forwarded to the northbound OSS.

## 2.2 Fault management tools and utilities

The Alarm Browser - reports alarms from registered events. When an alarm is generated, it is displayed in the Alarm Browser along with the date, time, the NE Id, the generating resource information, the severity and the probable cause. Highlighting the alarm displays the description of the alarm in the text box at the bottom of the Alarm Browser.

The Log Adaptor - generates logs from registered events. The log names and numbers are predetermined and are matched with the incoming event. A log with the corresponding name and number that contains the date, time, physical location, severity and any other pertinent information is generated and placed into a separate file.

## 2.3 Logs and Alarms

Two new alarms (ESA304 (nnEsaCoiFault) and ESA312 (EM generated)) will be added. The new alarm will be displayed at the Alarm Browser at the subnet as well as the well as the alarm browser for each corresponding network element. A log is also generated. Both are NE level alarms.

### 2.3.1 Explanation

#### 2.3.1.1 ESA304 (nnEsaCoiFault)

Title: nnEsaCoiFault

Name: ESA

Description: This log is generated by the EM in response to a trap from the MG9000 (nnEsaCoiFault). The MG9000 sends this trap when it detects communication problems to other nodes in the same community of interest.

Severity: Major

Event type: ESA community of interest

#### 2.3.1.2 ESA312 (Internodal Esa Provisioning Fault)

Title: Esa Provisioning Fault

Name: ESA

Description: This log is generated by the EM when a failure occurs whilst trying to provision internodal community of interest data for a given NE.

Severity: Major

Event type: Internodal ESA Provisioning failure

### 2.3.2 Format

The Log Delivery application for this feature generates logs in the Number 2 Switch Control Center (SCC2) format and the NT standard (STD) format explained in the PLOA\_SLOA\_LOG\_ALARMS DID.

#### 2.3.2.1 ESA304 (nnESAFault)

\*\*\*ESA304 Tue Jul 09 14:50:26 EDT 2005 TBL

NE Number: 8 NE Name: co8

State: not acknowledged

Type: Equipment

Cause: Equipment malfunction

Time: Jul 09 14:50:26:616 2005

Severity: Major

Description: Failed to ping members of community of interest

#### 2.3.2.2 ESA312 (Esa Provisioning Failure)

\*\*\*ESA312 Tue Jul 09 14:50:26 EDT 2005 TBL

NE Number: 8 NE Name: co8

State: not acknowledged

Type: Processing Error

Cause: Configuration Or Customization Error

Time: Jul 09 14:50:26:616 2005

Severity: Major

Description: Internodal ESA provisioning failure

### 2.3.3 Field descriptions

#### 2.3.3.1 ESA304 (nnEsaCoiFault)

**Table 1 Field descriptions ESA304**

| Field                 | Value                       | Description                                                                                                                                                                                               |
|-----------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| office identification | String                      | Identifies the switch that generates the log. This field is optional. The maximum length of this field is 12 characters.                                                                                  |
| alarm                 | ***, **, *, or blank        | Indicates the alarm type of the log report. ***=critical, **=major, *=minor, blank = no alarms/warning                                                                                                    |
| threshold             | + or blank                  | Indicates if a threshold is set for the log report. Plus (+) sign indicates that a threshold was set; if a blank, a threshold was not set.                                                                |
| report identification | AAAA nnn                    | Identifies the log subsystem that generates the report. This field uses 2-4 alphabetical characters and the number 100-999 of the log report in this subsystem.<br><br>For this log AAAA=MGC and nnn=600. |
| day                   | String                      | Identifies the day of the week.                                                                                                                                                                           |
| mmmmdd                | January-December<br>(01-31) | Identifies the month and date the report generates.                                                                                                                                                       |
| hh:mm:ss              | 00-23<br>00-59<br>00-59     | Identifies the hour, the minute, and the second the report generates.                                                                                                                                     |
| zone                  | PST, EST, MST, CST, AST     | Identifies the time zone.                                                                                                                                                                                 |
| yyyy                  | 0000-9999                   | Year                                                                                                                                                                                                      |
| ssdd                  | 0000-9999                   | Defines a different sequence number for each log report generated.                                                                                                                                        |



**Table 1 Field descriptions ESA304**

| Field               | Value          | Description                                                                                         |
|---------------------|----------------|-----------------------------------------------------------------------------------------------------|
| event type          | TBL, INFO, etc | Trouble, Service Summary, State Change, Information, Threshold and Expert.<br><br>TBL for this log. |
| event id            | String         | The Log Title.                                                                                      |
| NE Number           | integer        | Number of the NE                                                                                    |
| NE Name             | string         | Name of the NE                                                                                      |
| Fault Type          | string         | The type of the fault:<br><br>ESA Community of Interest                                             |
| nnUemgEventTime     | DateandTime    | The Date and Time the event occurred in the following format: day mmmdd hh:mm:ss zone yyyy          |
| nnUemgAlarmSeverity | String         | Major                                                                                               |
| Description         | string         | Failed to ping members of community of interest                                                     |

### 2.3.3.2 ESA312 (Internodal ESA Provisioning Fault)

**Table 2 Field descriptions ESA304**

| Field                 | Value                | Description                                                                                                              |
|-----------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------|
| office identification | String               | Identifies the switch that generates the log. This field is optional. The maximum length of this field is 12 characters. |
| alarm                 | ***, **, *, or blank | Indicates the alarm type of the log report.<br>***=critical, **=major, *=minor, blank = no alarms/warning                |

**Table 2 Field descriptions ESA304**

| Field                 | Value                       | Description                                                                                                                                                                                                |
|-----------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| threshold             | + or blank                  | Indicates if a threshold is set for the log report. Plus (+) sign indicates that a threshold was set; if a blank, a threshold was not set.                                                                 |
| report identification | AAAA nnn                    | Identifies the log subsystem that generates the report. This field uses 2-4 alphabetical characters and the number 100-999 of the log report in this subsystem.<br><br>For this log AAAA= MGC and nnn=600. |
| day                   | String                      | Identifies the day of the week.                                                                                                                                                                            |
| mmmmdd                | January-December<br>(01-31) | Identifies the month and date the report generates.                                                                                                                                                        |
| hh:mm:ss              | 00-23<br>00-59<br>00-59     | Identifies the hour, the minute, and the second the report generates.                                                                                                                                      |
| zone                  | PST, EST, MST, CST, AST     | Identifies the time zone.                                                                                                                                                                                  |
| yyyy                  | 0000-9999                   | Year                                                                                                                                                                                                       |
| ssdd                  | 0000-9999                   | Defines a different sequence number for each log report generated.                                                                                                                                         |
| event type            | TBL, INFO, etc              | Trouble, Service Summary, State Change, Information, Threshold and Expert.<br><br>TBL for this log.                                                                                                        |
| event id              | String                      | The Log Title.                                                                                                                                                                                             |
| NE Number             | integer                     | Number of the NE                                                                                                                                                                                           |
| NE Name               | string                      | Name of the NE                                                                                                                                                                                             |

**Table 2 Field descriptions ESA304**

| Field               | Value       | Description                                                                                |
|---------------------|-------------|--------------------------------------------------------------------------------------------|
| Fault Type          | string      | The type of the fault:<br><br>Processing Error                                             |
| nnUemgEventTime     | DateandTime | The Date and Time the event occurred in the following format: day mmmdd hh:mm:ss zone yyyy |
| nnUemgAlarmSeverity | String      | Major                                                                                      |
| Description         | string      | Internodal ESA provisioning failure                                                        |

### 2.3.4 Action

ESA304 (nnEsaCoiFault):

Check failure cause in alarm or log text and perform corrective action This will typically require network route troubleshooting. The MG9000 will clear the alarm autonomously once the root cause is fixed.

ESA312 (Internodal ESA provisioning failure):

Check failure log in the alarm or log text (most common is communication failure between the MG9000 EM and the MG9000). Once the root cause is fixed the alarm can be cleared by running and audit on the affected NE, or hitting “Apply” button on the Internodal ESA configuration GUI.

### 2.3.5 Associated Operational Measurements or Performance Measurements

None.

## 3: Configuration for A00007415

### 3.1 Hardware and Software Requirements

SN08 or a later software load for both the MG9000 and the Element manager. Passport Virtual Router (PVR).

### 3.2 Initial Configuration

This document assumes that the reader is familiar with Emergency Stand-Alone (ESA). ESA allows intra-nodal calls to complete when the MG is cutoff from the call server. Prior to SN08 only intra-nodal ESA was supported. With the introduction of this feature, inter-nodal ESA is now supported as of SN08.

Internodal ESA allows groupings of MG nodes into “communities of interest” (COI). All nodes in a community can communicate with each other during ESA, allowing calls to complete inside the community during ESA.

The Passport Virtual Router must be configured before Internodal ESA will function. The Passport settings are located on the NE Properties GUI on the EM. Each node in the community must be configured with PVR settings before the community is established.

The customer should first determine how the nodes will be grouped together into communities. In addition each MG will need to be configured with a new ESA IP address. This IP address should be chosen from an available IP address from the call control subnet (the same subnet used for the VMG configuration). No “default” communities are provided so each community must be manually configured by the customer in order for inter-nodal ESA to function.

The high-level steps for adding a community of interest are as follows:

- 1 Load the MG9K, MG9KEM, and PVR with the required software.
- 2 Launch the MG9K Element Manager.
- 3 Select a node to be added to the community and configure the PVR settings from the NE Properties screen. Repeat for each node.
- 4 Select Configure Internodal ESA from the Configuration Menu.
- 5 Set the ESA IP address of the nodes that are being placed into communities.
- 6 Create a new community of interest.
- 7 Add the desired nodes to the community of interest.
- 8 Click the Apply button.
- 9 Repeat for each community of interest.

### 3.3 Upgrade Considerations

None

#### 3.3.1 Dump and Restore (CM)

#### 3.3.2 Element Management Upgrade

#### 3.3.3 Downgrade impact

Prior to SN08, intra-nodal ESA was not supported. Therefore, if an MG9K is in a community and is downgraded to SN08 from SN08 an error message will

be generated and the user will not be able to downgrade until the node is removed from its community.

### 3.4 Data schema (DS) (CM, MIBS, RDB)

#### 3.4.1 New/modified tables, MIBs, or Database Schema

| Table/MIB name        | NEW/CHANGED/ or DELETED/ | Table Control (NEW/OLD/UNCHANGED) |
|-----------------------|--------------------------|-----------------------------------|
| nnCommunityOfInterest | NEW mib                  |                                   |

#### 3.4.2 Table/MIB/Remote Database Schema information

N/A

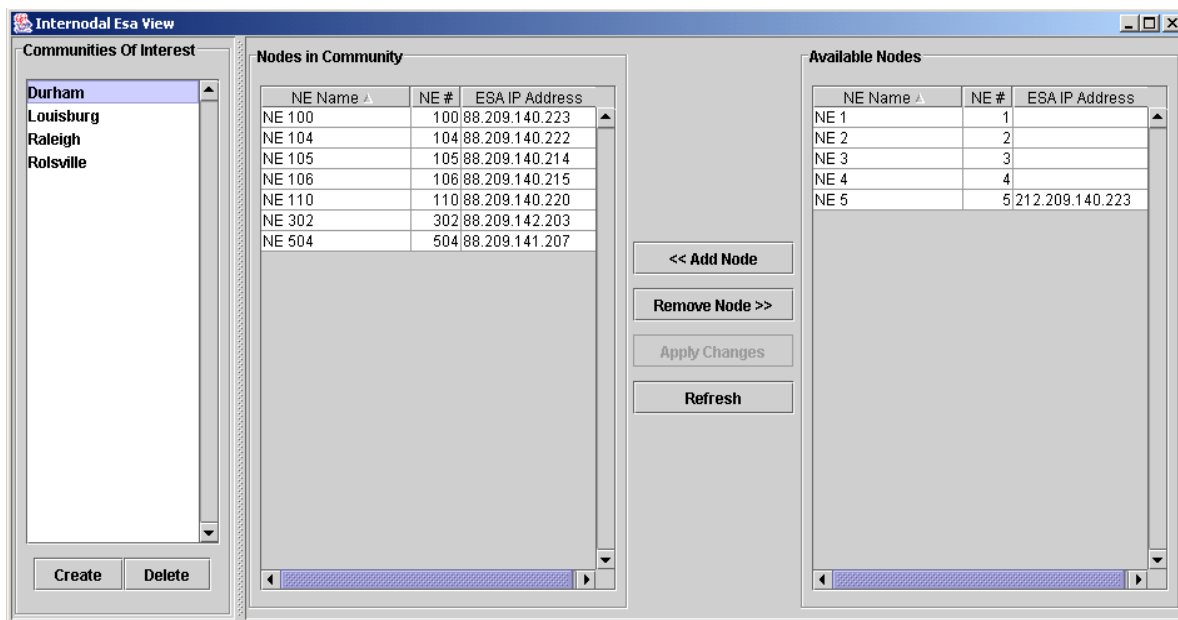
### 3.5 Element Management

#### 3.5.1 New/modified GUIs

| GUI name                     | NEW, CHANGED, or DELETED |
|------------------------------|--------------------------|
| Internodal ESA Configuration | NEW                      |

#### 3.5.2 GUI information

The new GUI will allow the customer to configure communities of interest. A screenshot is provided below for reference only - the screen is subject to change.

**Figure 1 Community Of Interest Configuration GUI**

### 3.5.2.1 GUI name: COI Configuration

#### Community of Interest Configuration

##### 3.5.2.1.1 Functional description

The purpose of the COI Configuration GUI is to allow the customer to manage Internodal ESA Communities of Interest. The GUI is accessed from the main subnet view window under the “Configuration” menu item. The GUI layout contains three main list windows:

- The Communities Of Interest list contains a list of all currently defined communities. When you click on an item in this list the “Nodes In Community” list changes. The number of communities is limited to 32.
- The “Nodes In Community” list displays all the nodes that are currently in the selected community of interest. The number of nodes in a community is limited to 15.
- The “Available Nodes” list displays all nodes that are available to be added to a community (they do not currently belong to a community). Only nodes that are ESA enabled will be displayed in this list.

The Create and Delete buttons allow the user to create and delete COI names. COI names are limited to 20 characters and can only contain the characters 'a' - 'z', 'A' - 'Z', and underscore.

The Add Node button allows the user to add nodes from the available list to the COI node list. Before a node is added the ESA IP address must be set.

The Delete Node button allows the user to remove nodes from the selected community. The currently selected node in the "Nodes In Community" list will be removed from the list and it will appear in the "Available Nodes" list.

The ESA IP Address field in the "Nodes in Community" list and "Available Nodes" list is editable. The other fields in the lists are not editable. The IP Address field must be configured before a node is added to the community. When the user presses enter or clicks in another window or button, the IP address will be validated and saved in the database. The IP address must be "well-formed" and unique in the system.

The Apply Changes button allows the user to apply changes to the Community. The button is disabled until there are changes to commit. When the user makes changes to a community the button is disabled. If the user tries to leave the GUI or click on another community name, the user will be prompted to save or discard changes.

When the user presses Apply, a status window will display the status of NEs that are being updated. The status window will scroll as NEs are successfully updated or if there are any failures. A configuration alarm will be generated if there are any configuration failures. However, if the user exits the GUI and returns to the GUI, there is no way to determine if there were any previous failures, but the alarm will continue to be displayed in the alarm manager until the configuration is successful. If there is a failure, the user can trigger an audit to re-configure the COI or the user can press the "Reconfigure" button on the GUI. The "Reconfigure" button will cause the currently selected COI data to be sent to all affected nodes.

The Refresh button allows the user to completely refresh the GUI with data from the database.

#### **3.5.2.1.2 GUI usage and implications**

The GUIs must be configured in the following sequence. This sequence is for adding a new community of interest.

- 1 Configure MG9K nodes to support ESA, configuring VMGs, etc.
- 2 Bring up the COI Configuration GUI.
- 3 Click the Create button to create a new COI name.
- 4 In the "Available Nodes" list, select a node to be added to the community.

- 5 Set the ESA IP address of the node and press enter.
- 6 Click the Add Node button.
- 7 Repeat until all desired nodes are added to the community.
- 8 Press the Apply Changes button.

A NE cannot be deleted if it is in a community of interest. An error message will be generated if the user attempts to delete an NE that is configured in a community.

### 3.5.2.1.3 GUI size

| Abbreviated GUI name | Minimum instances | Maximum instances | Information on memory    |
|----------------------|-------------------|-------------------|--------------------------|
| COI Configuration    | 0                 | 1                 | fixed memory allocation. |

### 3.5.2.1.4 GUI fields

The following table lists fields for the GUI or pull down menu <abbreviated name of GUI>.

**Table 1 GUI field descriptions**

| Field          | New or Changed | Subfield | Entry                                                                                                                                           | Explanation and action                                                                         | Associated MIB entry |
|----------------|----------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|----------------------|
| ESA IP Address | New            | no       | Valid, Unique IP Address                                                                                                                        | The initial value is blank. The field must be filled in before a node is added to a community. |                      |
| COI Name       | New            | no       | Community of Interest Name. Up to 20 characters (a-z, A-Z, and underscore). COI names not case sensitive. So "COI1" and "coi1" cannot co-exist. |                                                                                                |                      |

### 3.5.2.1.5 Usage example

The following example shows sample datafill or menu selection for the GUI Community of Interest:

See the above image.



### 3.6 Configuration Walkthrough

Before initial configuration of inter-nodal ESA begins, the MG9K nodes must be configured to support ESA (see feature A00002020 for more details on configuring intra-nodal ESA). The customer should also determine how the nodes will be grouped into communities, i.e. which nodes go into which community of interest. In addition, each MG9K that supports inter-nodal ESA will need to be configured with an ESA IP address. This IP address should be chosen from an available IP address from the call control subnet. This is the subnet of IP addresses used for VMG configuration. No “default” communities are provided so each community must be manually configured by the customer in order for intra-nodal ESA to function.

The high-level steps for adding a community of interest are as follows:

- 1 Load both the MG9K and MG9KEM with required software.
- 2 Launch the MG9K Element Manager from a web browser.
- 3 Select Configure Internodal ESA from the main menu.
- 4 Set the ESA IP address of the nodes that are being placed into communities.
- 5 Create a new community of interest.
- 6 Add desired nodes to the community of interest.
- 7 Click Apply Changes button.
- 8 Repeat for each community of interest.

When the user presses Apply a status window will display the status of NEs that are being updated. The status window will scroll as NEs are successfully updated or if there are any failures. A configuration alarm will be generated if there are any configuration failures. However, if the user exits the GUI and returns to the GUI, there is no way to determine if there were any previous failures, but the alarm will continue to be displayed in the alarm manager until the configuration is successful. If there is a failure, the user can trigger an audit to re-configure the COI or the user can press the “Reconfigure” button on the GUI. The “Reconfigure” button will cause the currently selected COI data to be sent to all affected nodes.

***Product = MG 9000***

### **A00008387--GLC-32 AB Card Support**

## ***Functional Description***

### **1.1 Applicable Solution(s)**

UA-IP, PT-AAL2

### **1.2 Description**

This feature enhances the MG9KEM to provide the following capabilities:

- GLC-32 AB card (PEC NY53AB) support

Prior to this feature, MG9KEM and MG9K gateways only support the GLC-32 AA card (PEC NY53AA). With the combination of this feature and the matching SN08 gateway feature, both GLC cards, NY53AA and NY53AB are supported in SN08.

- Allowing bulk provisioning GLC card's line service types

This feature provides the capability for the user to bulk provision all the line circuits on a GLC card to the same service type. This option is only enabled when the card is deprovisioned.

- Card replacement support for GLC and WLC cards

With the combination of this feature and the matching SN08 gateway feature, card replacement between GLC AA and GLC AB cards and WLC and GLC cards can be performed without deprovisioning the card.

### **1.3 Hardware Requirements or Dependencies**

This feature provides support for the NY53AB board with V2.1 or higher Infineon chipset.

### **1.4 Software Requirements or Dependencies**

The capabilities provided by this feature require the SN08 gateway load.

### **1.5 Limitations and restrictions**

1. SN08 gateway is required to support the NY53AB GLC card.
2. Once the NY53AB GLC card(s) are installed on a SN08 gateway, any gateway downgrade to pre-SN08 loads will render the NY53AB GLC card non-functional. The NY53AB GLC cards should be deprovisioned and removed prior to the downgrade attempt.
3. Since WLC card only supports the "potsLoopStart" line service type, when replacing a GLC card with a WLC, any EBS/pPhone or potsGroundStart lines on the GLC card MUST be decommissioned prior to the card replacement attempt; failed to do so will result in lost of service to these

lines. Once the GLC card is replaced with a WLC, all line circuits on the card will assume the line service type of “potsLoopStart”.

4. The WLC and GLC card replacement is only supported with the SN08 gateway.

## 1.1 Interactions

## 1.2 Glossary

| Term | Description      |
|------|------------------|
| GLC  | Global Line Card |
| WLC  | World Line Card  |

## *Configuration for A00008387*

### 2.1 Hardware and Software Requirements

Standard Media Gateway 9000 Element Manager (MG9000 EM) configuration.

### 2.2 Initial Configuration

Standard Media Gateway 9000 Element Manager (MG9000 EM) configuration.

### 2.3 Office/Subnet parameters (OP/SP) (CM & SESM)

N/A

### 2.4 Upgrade Considerations

#### 2.4.1 Dump and Restore (CM)

#### 2.4.2 Element Management Upgrade

#### 2.4.3 Downgrade impact

SN08 gateway is required to support the NY53AB GLC card. Once the NY53AB GLC card(s) are installed on a SN08 gateway, any gateway downgrade to pre-SN08 loads will render the NY53AB GLC card non-functional. The NY53AB GLC cards should be deprovisioned and removed prior to the downgrade attempt.

SN06.2 gateway loads do not support pPhone and potsGroundStart line service types for GLC cards. When downgrading to the SN06.2 gateway load, if pPhone and postGroundStart lines are provisioned on the GLC cards, they will have to be deprovisioned prior to the downgrade attempt.

The WLC and GLC card replacement is only supported with the SN08 gateway.

## 2.5 Data schema (DS) (CM, MIBS, RDB)

N/A

## 2.6 Service Orders (SO) (CM & SESM)

N/A

## 2.7 Software optionality control (SOC)

N/A

## 2.8 Element Management

### 2.8.1 New/modified GUIs

Table 2 New or modified GUIs

| GUI name              | NEW, CHANGED, or DELETED |
|-----------------------|--------------------------|
| LineCoefficientView   | changed                  |
| BulkProvSvceTypesView | new                      |

### 2.8.2 GUI information

#### 2.8.2.1 GUI name: LineCoefficientView

##### 2.8.2.1.1 Functional description

This is an existing view that shows the Line Coefficients available for the GLC circuits.

##### 2.8.2.1.2 GUI usage and implications

This is an existing view that shows the Line Coefficients available for the GLC circuits. This GUI is updated to display the Line Coefficient information in a table format. The usage for this GUI has not changed.

##### 2.8.2.1.3 GUI fields

**Table 3 GUI field descriptions**

| Field        | New or Changed | Subfield | Entry | Explanation and action                               | Associated MIB entry |
|--------------|----------------|----------|-------|------------------------------------------------------|----------------------|
| Name         | changed        |          |       | Name of the Coefficient                              |                      |
| Index        | changed        |          |       | Coefficient Index                                    |                      |
| PEC          | new            |          |       | GLC Card PEC (NY53AA or NY53AB)                      |                      |
| Country Info | new            |          |       | Country the coefficient is intended for              |                      |
| CRAM         | new            |          |       | cRAM info from the GLC card                          |                      |
| Vinetic Ver. | new            |          |       | Vinetic version from the GLC card                    |                      |
| Loop Info    | new            |          |       | loop status                                          |                      |
| Metering     | new            |          |       | with or without Metering                             |                      |
| Svc Type     | new            |          |       | service type the coefficient is for                  |                      |
| Default      | new            |          |       | is or is not the default coefficient for the country |                      |

**2.8.2.1.4 Usage example**

From the GLC Card View pulldown menu, select “Coefficient Table Manager...” to launch the GUI.

Here is an example of the GUI:

NE: 18 Line Coefficient Table

MG9000

| Name          | Index | PEC    | Country Info | CRAM | Vinetic Ver. | Loop Info          | Metering | Svc Type | Default |
|---------------|-------|--------|--------------|------|--------------|--------------------|----------|----------|---------|
| PPHONE_LL     | 90    | NY53AA | Global       | 0    | 0x2484       | LongLoop           | false    | pPhone   | true    |
| PPHONE_LL_LV  | 91    | NY53AA | Global       | 0    | 0x2484       | LongLoopLowVoltage | false    | pPhone   | false   |
| POTS_SL       | 1     | NY53AA | NorthAmerica | 0    | 0x2484       | ShortLoop          | false    | pots     | true    |
| POTS_LL_LV    | 13    | NY53AA | NorthAmerica | 0    | 0x2484       | LongLoopLowVoltage | false    | pots     | false   |
| POTS_LL       | 2     | NY53AA | NorthAmerica | 0    | 0x2484       | LongLoop           | false    | pots     | false   |
| POTS_SL       | 10    | NY53AA | Russia       | 0    | 0x2484       | ShortLoop          | false    | pots     | true    |
| POTS_LL       | 11    | NY53AA | Russia       | 0    | 0x2484       | LongLoop           | false    | pots     | false   |
| POTS_LL_LV    | 12    | NY53AA | Russia       | 0    | 0x2484       | LongLoopLowVoltage | false    | pots     | false   |
| POTS_SL       | 3     | NY53AA | Spain        | 0    | 0x2484       | ShortLoop          | false    | pots     | true    |
| POTS_LL       | 5     | NY53AA | Spain        | 0    | 0x2484       | LongLoop           | false    | pots     | false   |
| POTS_LL_WM_LV | 14    | NY53AA | Spain        | 0    | 0x2484       | LongLoopLowVoltage | true     | pots     | false   |
| POTS_LL_WM    | 6     | NY53AA | Spain        | 0    | 0x2484       | LongLoop           | true     | pots     | false   |
| POTS_SL_WM    | 4     | NY53AA | Spain        | 0    | 0x2484       | ShortLoop          | true     | pots     | false   |
| POTS_SL       | 7     | NY53AA | Mexico       | 0    | 0x2484       | ShortLoop          | false    | pots     | true    |
| POTS_LL       | 8     | NY53AA | Mexico       | 0    | 0x2484       | LongLoop           | false    | pots     | false   |
| POTS_LL_LV    | 9     | NY53AA | Mexico       | 0    | 0x2484       | LongLoopLowVoltage | false    | pots     | false   |
| PPHONE_LL     | 95    | NY53AB | Global       | 0    | 0x1490       | LongLoop           | false    | pPhone   | true    |
| PPHONE_LL_LV  | 96    | NY53AB | Global       | 0    | 0x1490       | LongLoopLowVoltage | false    | pPhone   | false   |
| POTS_LL       | 31    | NY53AB | NorthAmerica | 0    | 0x1490       | ShortLoop          | false    | pots     | true    |
| POTS_LL       | 32    | NY53AB | NorthAmerica | 0    | 0x1490       | LongLoop           | false    | pots     | false   |
| POTS_LL_LV    | 33    | NY53AB | NorthAmerica | 0    | 0x1490       | LongLoopLowVoltage | false    | pots     | false   |
| POTS_SL       | 50    | NY53AB | Russia       | 0    | 0x1490       | ShortLoop          | false    | pots     | true    |
| POTS_LL       | 51    | NY53AB | Russia       | 0    | 0x1490       | LongLoop           | false    | pots     | false   |
| POTS_LL_LV    | 52    | NY53AB | Russia       | 0    | 0x1490       | LongLoopLowVoltage | false    | pots     | false   |

Add Delete Refresh

### 2.8.2.1.5 GUI release history update

### 2.8.2.1.6 Context sensitive launching information

This GUI is only accessible through the GLC Card View pulldown menu.

### 2.8.2.1.7 Supplementary information

## 2.8.3 GUI information

### 2.8.3.1 GUI name: BulkProvSvceTypesView

#### 2.8.3.1.1 Functional description

This is a new view. This view can be used to bulk provision all the line circuits on a GLC card to the same service type.

#### 2.8.3.1.2 GUI usage and implications

This view can be used to bulk provision all the line circuits on a GLC card to the same service type. This GUI is only enabled when the card is deprovisioned.

#### 2.8.3.1.3 GUI fields

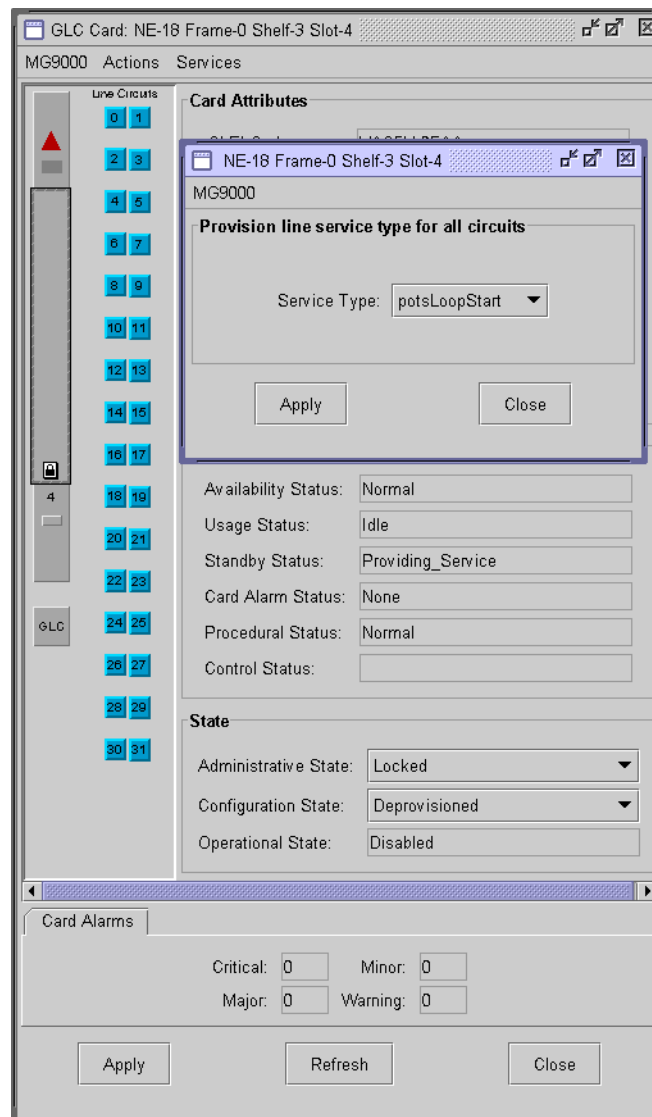
**Table 4 GUI field descriptions**

| Field        | New or Changed | Subfield | Entry | Explanation and action                                                                     | Associated MIB entry |
|--------------|----------------|----------|-------|--------------------------------------------------------------------------------------------|----------------------|
| Service Type | new            |          |       | This is a selection field, the options are:<br>potsLoopStart, pPhone<br>or potsGroundStart |                      |

**2.8.3.1.4 Usage example**

From the GLC Card View, offline and deprovision the card. Once the card is deprovisioned, select “Provision Bulk Line Service Types...” from the card’s pulldown menu to launch the GUI. Select the desired service type from the new GUI then press “Apply” to provision this service type for all the circuits on the card.

Here is an example of the GUI:



#### 2.8.3.1.5 GUI release history update

#### 2.8.3.1.6 Context sensitive launching information

This GUI is only accessible through the GLC Card View pulldown menu when the card is deprovisioned.

#### 2.8.3.1.7 Supplementary information



## 2.8.4 CLUI Interface

## 2.9 User interface changes

N/A

## 2.10 OSSGate Interface Changes

N/A

## 2.11 Security

Only users in the *emsmtc*, *emsrw* or *emsadm* groups are authorized to bulk provision the GLC card's line service types.

## 2.12 Configuration Walkthrough

# *Product = Network Patch Manager (NPM)*

## A00006901--Missing Patches

### *Functional Description*

### 1.1 Applicable Solution(s)

PT-IP, UA-IP, IAC

### 1.2 Description

This feature, Missing Patches, is a feature that addresses several items. The main purpose of this feature is to aid the customer in getting and applying patches to his office in a timely and routine fashion. This feature also address items that will aid the user/customer in maintaining data over an upgrade as well as adding some clean up mechanisms that the user/customer can implement. The following is a list of items that this feature will provide:

- The ability to perform PFRS (Patch File Receipt System) capabilities on demand from the NPM User Interfaces.
- A new PFRS GenReport (pfrsGenReport) task will be available to the user from the Network Patch Manager User Interfaces. This task will allow the user to create an INFORM list that will be automatically dropped off at the customers patch drop off box.

- A new PFRS GetPatch (pfrsGetPatch) task will be available to the user from the Network Patch Manager User Interfaces. This task will go to the customers/users patch drop off box and get the patches that have been newly downloaded and add them to the NPM database.
- A new PFRSGETPATCH\_FAIL Major alarm and log will be raised in the event that the PfrsGetPatch Task does not executed successfully. The alarm can only be cleared after a successful execution of the Pfrs-GetPatch Task.
- A new PFRSGENREPORT\_FAIL Major alarm and log will be raised in the event that the PfrsGenReport Task does not executed successfully. The alarm can only be cleared after a successful execution of the PfrsGenReport Task.
- This feature also creates two new system plans for the PFRS functions; one plan will contain the PfrsGetPatch task and the other plan will contain the PfrsGenReport task. Each plan can be scheduled through the NPM Scheduler. This allows flexibility for the customer to schedule and execute PFRS functions according to when each site needs to execute them.
- This feature provides a mechanism that can be accessed from the NPM User Interface that will allow the user to delete patches from the “patch drop off” box. If this function is set in the NPM, the NPM will delete the patches after the PFRS GetPatch function has been executed.
- An automatic audit of a device immediately after a reload. This will provide immediate information back to the user/customer about the device and if patches need to be re-applied.
- This feature adds a new alarm for R-status or released patches; REL\_GEN\_NOT\_APP. This alarm will have a priority of Major.
- The current alarm for GEN patches: GEN\_NOT\_APP will continue to have a priority of NO\_ALARM for all GEN patches.
- This feature also addresses issues with retaining information over upgrades of the NPM and this is responsible for adding the following functions to the NPM. The user will no longer have the ability to change System Defined Reports, Tasks, Sets and Alarms. Users will only be able to modify the execution time and enabled status for System Defined Plans. The user will still have the ability to view the defi-

inition of these items via a new “View” button that will be provided on the NPM GUI. The user will still have the ability to create and modify their own reports, plans, tasks, sets and alarms.

- This feature adds a new system plan to the NPM scheduler that will automatically delete reports out of the /data/npm/reports directory. The user will be able to specify the frequency that the reports are deleted through the NPM Scheduler. A default value of thirty days will be set initially in the NPM.
- This feature provides an enhancement to the NPM GUI which will improve overall usability. A process monitor will be added which will provide a visual indicator to the user that a submitted request is in progress. This monitor will be specific to each instance of the NPM GUI and will not indicate activity of multiple GUIs.
- This feature will enhance the NPM GUI Maintenance window. A new refine or filter button will be available which will allow the user to quickly determine which patch(es) are applicable to which device(s) and vice versa.
- This feature will provide the CM CLI to each NPM GUI window. This will provide clarification when the user is performing patching operations on multiple offices.

### **1.3 Hardware Requirements or Dependencies**

None.

### **1.4 Software Requirements or Dependencies**

None.

### **1.5 Limitations and restrictions**

This feature cannot be patched back to earlier releases due to NPM database changes that must occur with this feature.

### **1.6 Interactions**

None.

## 1.7 Glossary

| Term | Description                 |
|------|-----------------------------|
| NPM  | Network Patch Manager       |
| PFRS | Patch File Receipt System   |
| GUI  | Graphical User Interface    |
| CLUI | Command Line User Interface |

## 2: Fault Management for A00006901

### 2.1 Fault management strategy

This feature moves the PatchFile Receipt System access from the SSPFS TOOL into the Network Patch Manger (NPM). This feature also addresses the difference between R-status patches and V-status patches. The addition of this software into the NPM warrants the addition of three new alarms:

- REL\_GEN\_NOT\_APP
- PFRSGETPATCH
- PFRSGENREPORT

### 2.2 Fault management strategy

No additional tools are implemented by this feature. Customer alarms for this feature are generated via the existing alarm software in the Network Patch Manager.

### 2.3 ALARMS

#### 2.3.1 REL\_GEN\_NOT\_APP Alarm

- **Alarm Format:**

\*\* NPM360 SEP21 11:23:55 1100 INFO Alarm Raised

Alarm REL\_GEN\_NOT\_APP has been raised.

Alarm Description: Released patches not applied.

- **Severity:** Major
- **Cause:** A patch that has a status of R has been validated but not applied.

- **Duration:** The alarm will continue to alarm until all the R status patches have been applied.
- **Action:** Apply all R status patches.

### 2.3.2 PFRSGENREPORT Alarm

- **Alarm Format:**

\*\* NPM360 SEP21 11:23:55 1100 INFO Alarm Raised

Alarm PFRSGENREPORT has been raised.

Alarm Description: PFRS GENREPORT task has failed.

- **Severity:** Major
- **Cause:** PFRS GENREPORT failed to execute.
- **Duration:** The alarm will continue to alarm until the next successful execution of the PFRS GENREPORT task.
- **Action:** Fix the error and execute the task again.

### 2.3.3 PFRSGETPATCH

- **Alarm Format:**

\*\* NPM360 SEP21 11:23:55 1100 INFO Alarm Raised

Alarm PFRSGETPATCH has been raised.

Alarm Description: PFRS GETPATCH task has failed.

- **Severity:** Major
- **Cause:** PFRS GETPATCH failed to execute.
- **Duration:** The alarm will continue to alarm until the next successful execution of the PFRS GETPATCH task.
- **Action:** Fix the error and execute the task again.

## 2.4 Related documentation

## 3: Configuration for A00006901

## 3.1 Hardware and Software Requirements

This feature requires an SN08 Network Patch Manager (NPM) and the SN08 SSPFS platform.

## 3.2 Network Patch Manager Server

### 3.2.1 Initial Configuration

#### 3.2.1.1 Upgrade

One of the functions of this feature is to save System and User defined information in the NPM database from one release to the next starting with SN08.

Therefore, the procedure for upgrades from an SN08 NPM and beyond retains the *user* and *system* defined information for tasks, set, alarms, reports and plans over an upgrade. If the user is upgrading from a pre-SN08 to SN08 the information in the database is un-initialized as it has always been.

If the user is going from SN08 to SN08 or above, the NPM now retains system and user defined data for tasks, sets, and plans.

If the user wishes to initialize the NPM database after the SN08 (and beyond) package has been installed; the user must exit the CLI tool after the NPM configuration and re-enter the CLI tool. The user must make their way back into the NPM configuration, only this time the user will choose “CreateDB”. Once this has finished executing, the NPM database will be initialized and all user defined data will be erased.

#### 3.2.1.2 PFRS

In SN07 the configuration of PFRS was moved to the CLI tool. Although the tool offered the user the ability to set up, and execute a PFRS GENREPORT and a PFRS GETPATCH either on demand or through a scheduler, the user needed to have root access to the SSPFS platform to utilize these commands.

This feature moves this information from the CLI tool into the NPM GUI and CLUI. Access for this functionality is the same as it is for all the other NPM maintenance commands; EMSADM.

The user may now set up the PFRS drop box information via a preferences window in the NPM GUI and via a preferences command in the NPM CLUI.

The user may also execute a PFRS GENREPORT and a PFRS GETPATCH on demand though the NPM by executing either one of two NPM system pre-defined tasks; PFRSGENREPORT and PFRSGETPATCH.

Both of these tasks are available in the Maintenance GUI panel or can be executed as part of the existing runtask command in NPM CLUI.

This feature also provides new functionality for the PFRS user. The user can now decide if they would like the NPM to “clean up” or delete patches from the drop box that have been transferred to the NPM after the PFRSGETPATCH task has been executed.

#### **3.2.1.2.1 PFRS Scheduling**

These two tasks can also be scheduled through the NPM Scheduler either via a user defined plan or via the provided NPM system plans; GETPATCH and GETREPORT. Although neither of the plans are defaulted to enabled; the default execution time for GETREPORT is at 9:00 am and the default execution time for GETPATCH is 11:00 pm.

It is recommended that the GETREPORT plan be scheduled to execute before the GETPATCH plan. Both plans should be executed before the NPM System plan.

#### **3.2.1.3 Delete Reports**

Delete Reports is a new NPM system defined task. This task is used to delete reports that have been created and left in the /data/npm/reports directory. Reports that are left in this directory are created when a user schedules reports to execute through the NPM Scheduler.

#### **3.2.1.4 Automatic audit of MG9K and GWC devices after reload**

This feature changes the 20 minute audit after an MG9K or GWC device reload to be immediately. This will provide immediate information back to the user/customer about the device load and if patches need to be re-applied.

### **3.3 Network Element Patch Manager GUI/CLUI**

#### **3.3.1 New/modified GUIs**

The NPM GUI has been modified to include a new “View” button on specific NPM GUI panels and a new PatchFile Retrieval Preferences tab as part of the Preferences GUI. The following table will identify the names of each panel that has been modified as a result of this feature because of these specific items and others that will be described later in this document.

**Table 1 New or modified GUIs**

| <b>GUI name</b>                | <b>NEW, CHANGED, or DELETED</b> |
|--------------------------------|---------------------------------|
| Maintenance - Task List        | CHANGED                         |
| Maintenance - Maintenance Task | CHANGED                         |
| Reports - Report List          | CHANGED                         |
| Alarms - Alarm List            | CHANGED                         |
| Plans - Plan List              | CHANGED                         |

**Table 1 New or modified GUIs**

| GUI name                                         | NEW, CHANGED, or DELETED |
|--------------------------------------------------|--------------------------|
| Preferences - PatchFile Retrieval<br>Preferences | NEW                      |

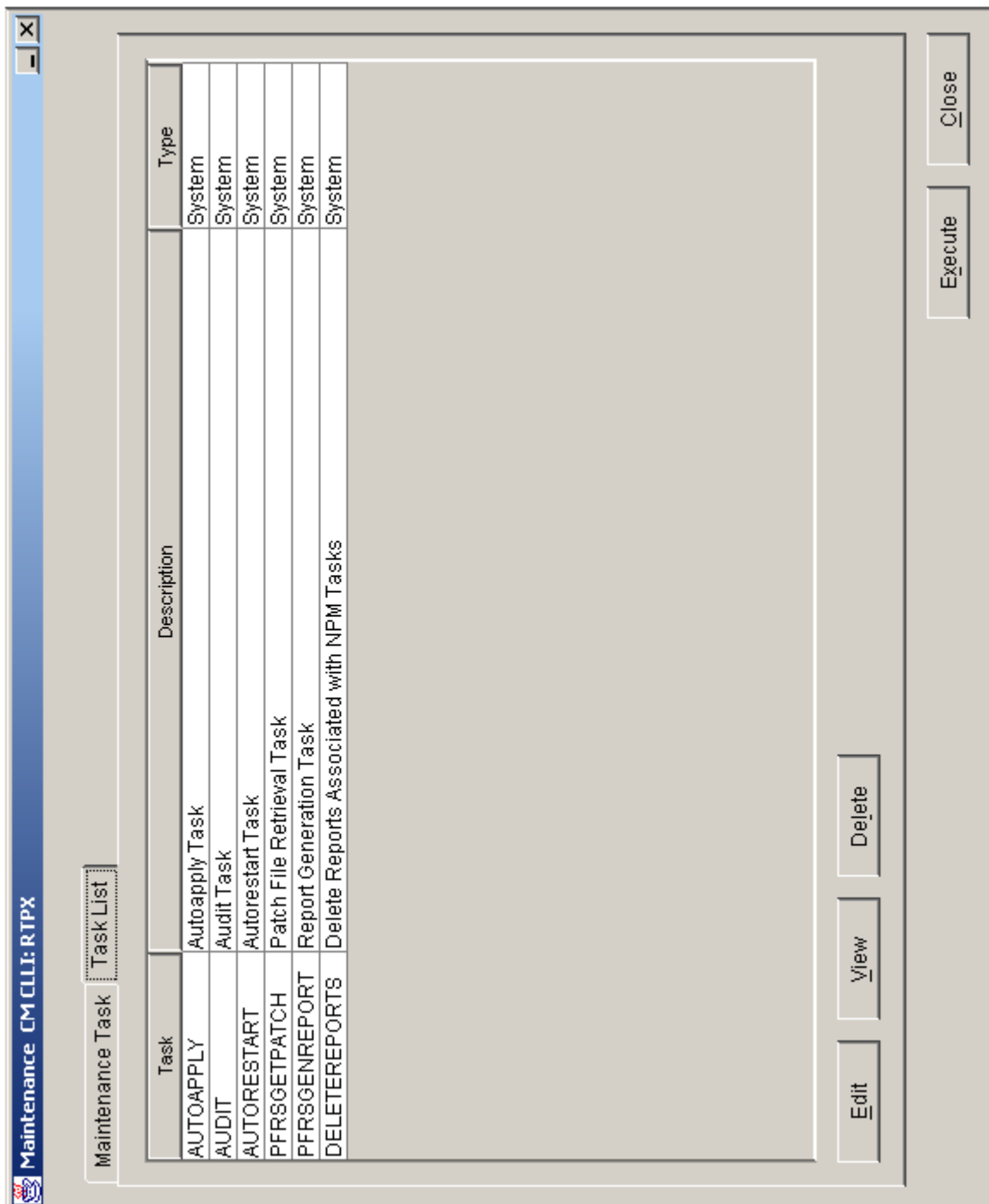
### 3.3.2 GUI information

In addition to the GUI/CLUI items that have been added as a result of the NPM Server, this feature provides the following new features specific to the NPM GUI:

- System defined information in the NPM GUI can now only be viewed and cannot be edited.
- a new refine or filter button will be available which will allow the user to quickly determine which patch(es) are applicable to which device(s) and vice versa.
- a process monitor has been added which will provide a visual indicator to the user that a submitted request is in progress. This monitor will be specific to each instance of the NPM GUI and will not indicate activity of multiple GUIs.
- the CM CLI will appear on each NPM GUI window. This will provide clarification when the user is performing patching operations on multiple offices.

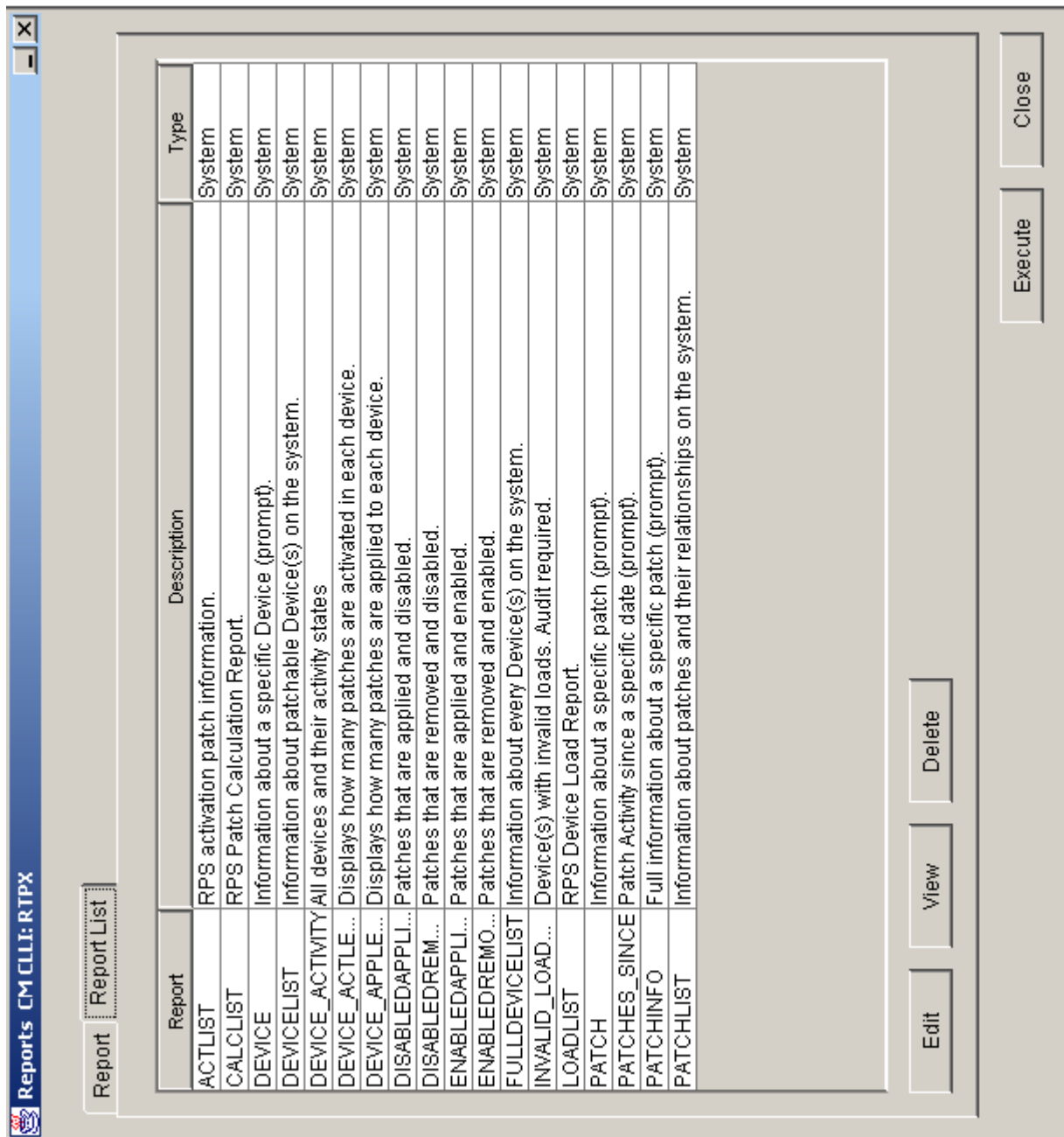


Figure 1 GUI name: Maintenance - Task List



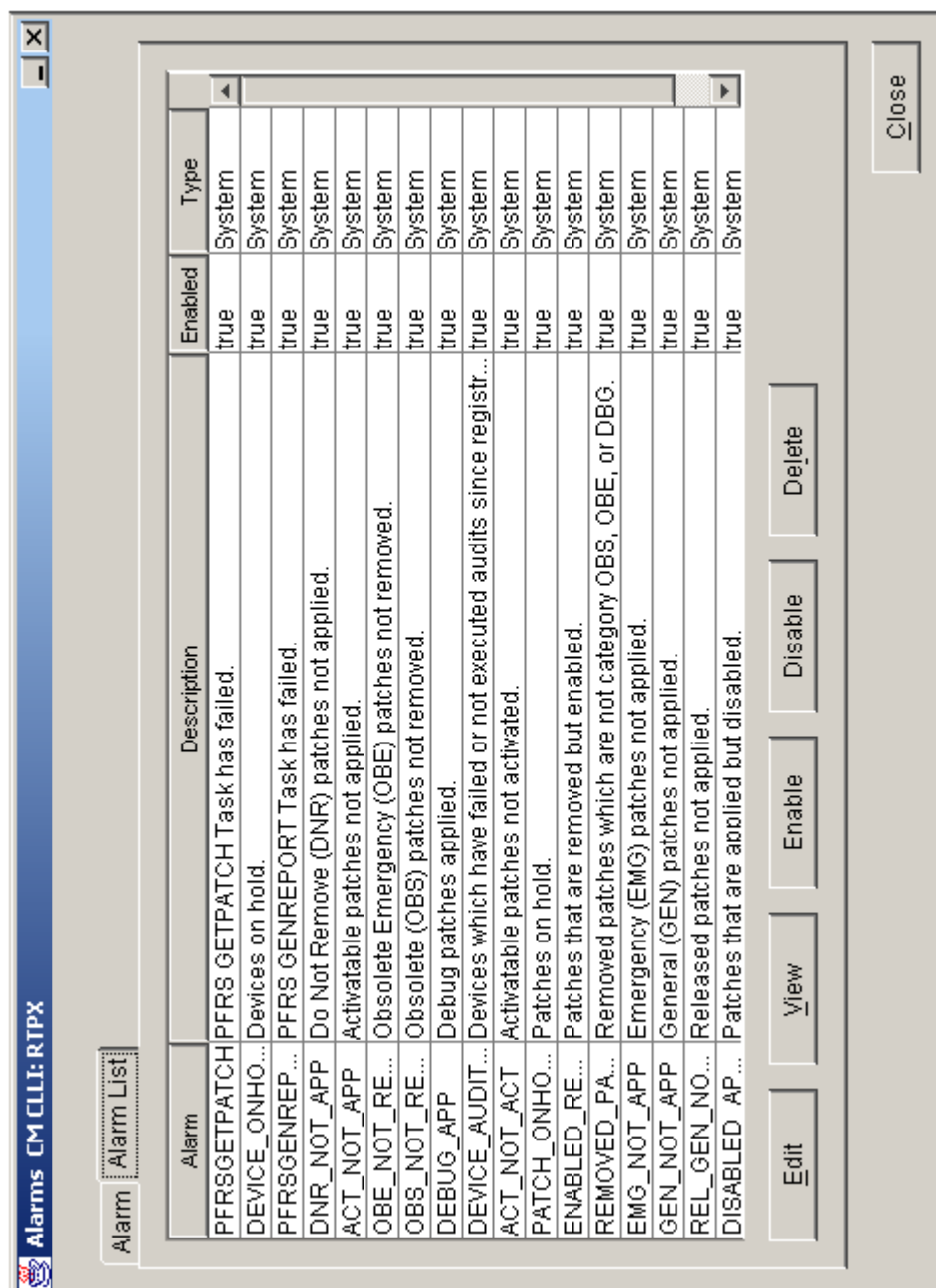
Notice the three new system defined tasks and the new “View” button on the bottom of the panel. System defined tasks can only be viewed.

Figure 2 GUI name: Reports - Reports List



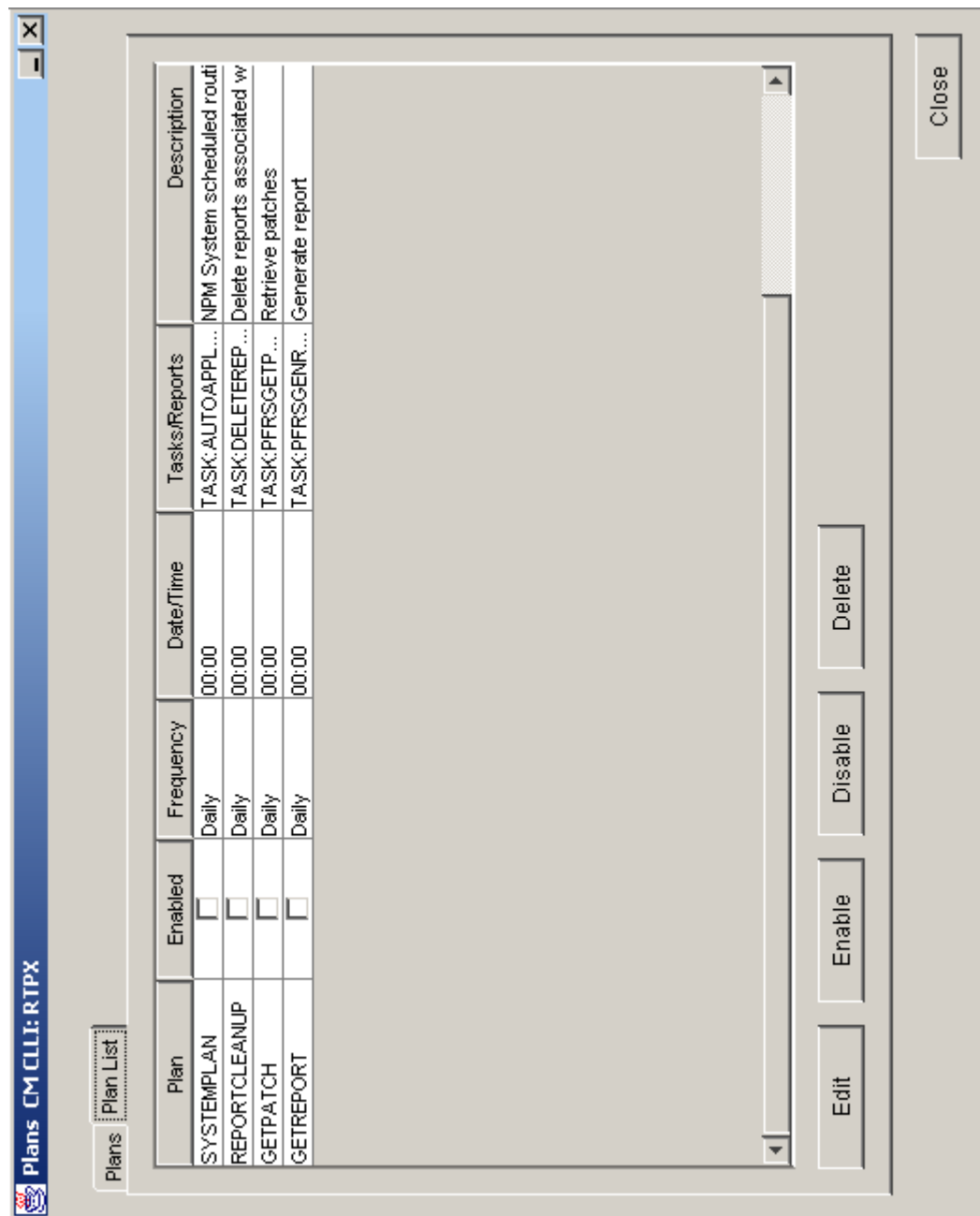
Notice the new “View” button on the bottom of the panel. System defined reports can only be viewed.

Figure 3 GUI name: Alarm - Alarm List

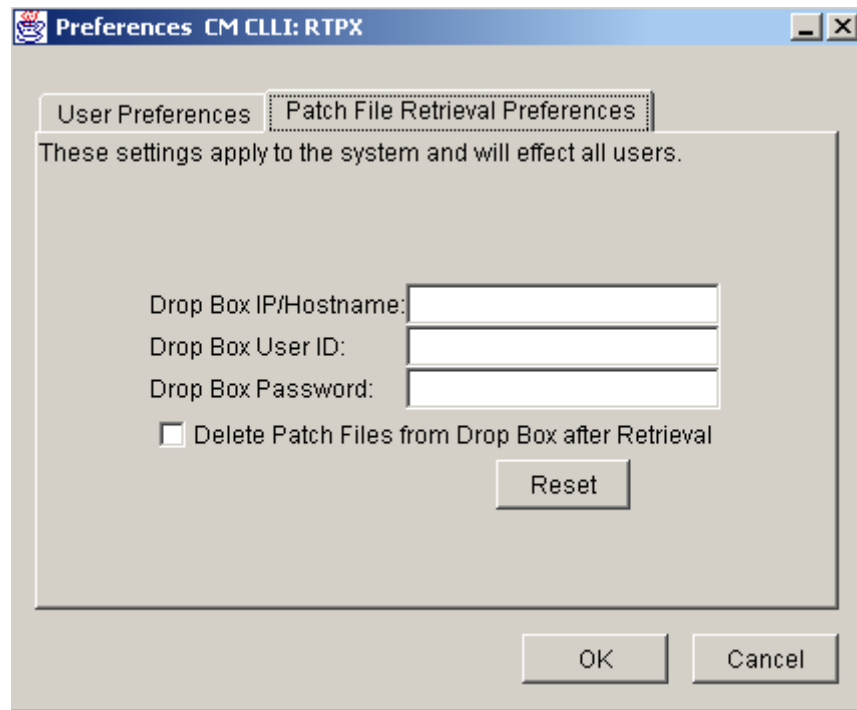


Notice the new “View” button on the bottom of the panel. System defined reports can only be viewed.

Figure 4 GUI name: Plan - Plan List



Notice the three new system defined plans that can be enabled and scheduled.

**Figure 5 GUI name: Preferences - PatchFile Retrieval Preferences**

Preferences CM CLI: RTPX

User Preferences Patch File Retrieval Preferences

These settings apply to the system and will effect all users.

Drop Box IP/Hostname:

Drop Box User ID:

Drop Box Password:

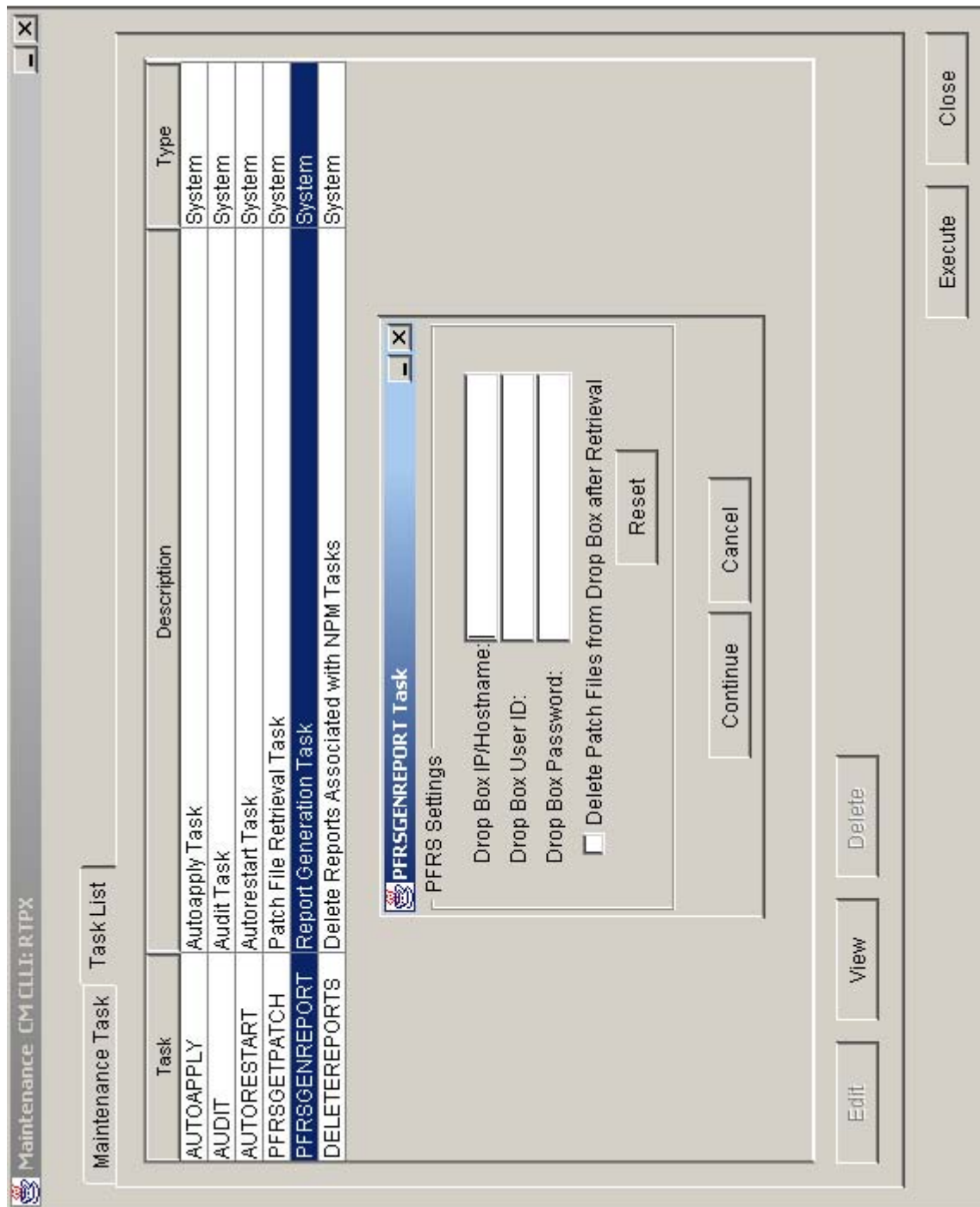
☐ Delete Patch Files from Drop Box after Retrieval

Reset

OK Cancel

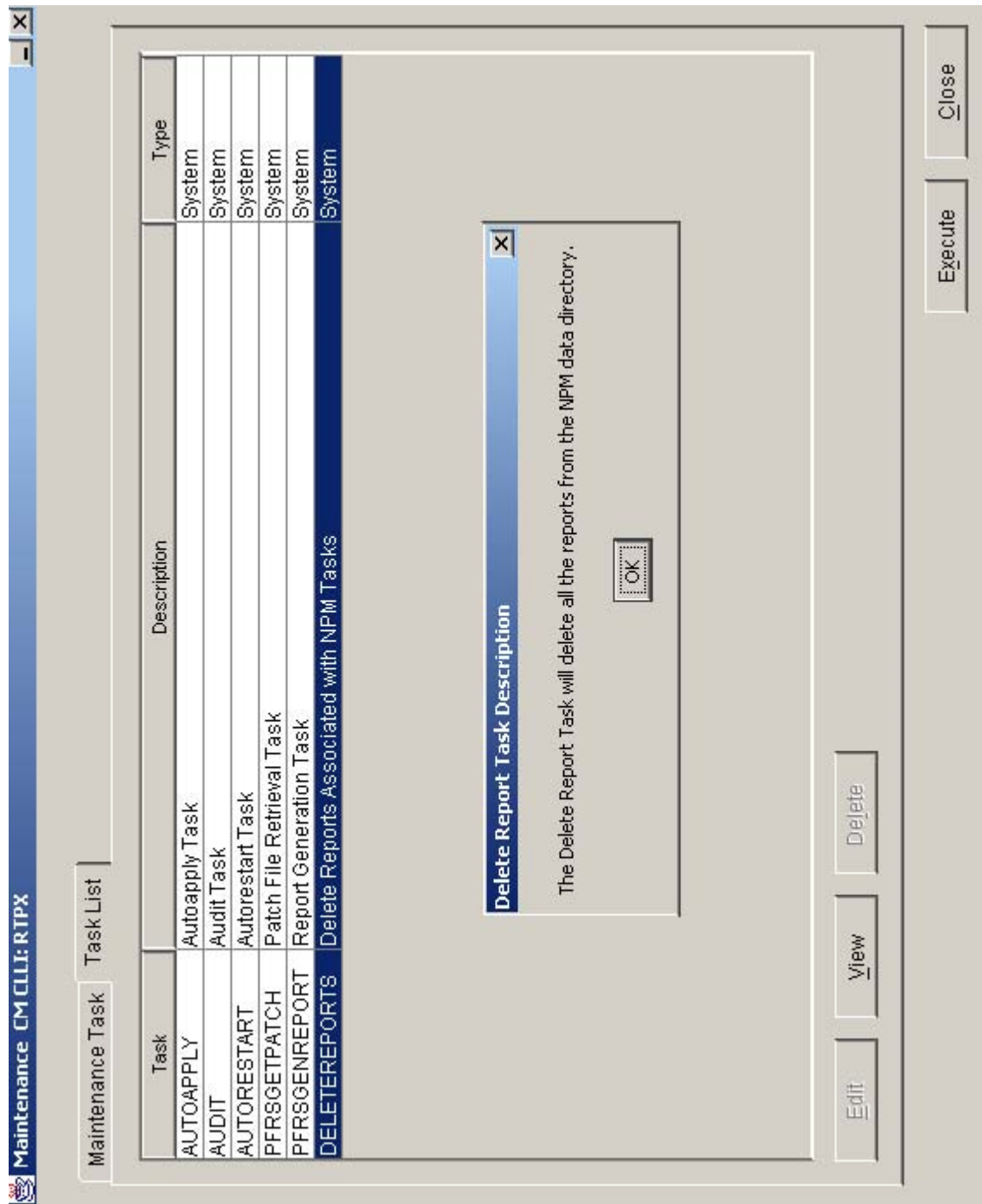
This PatchFile Receipt Preference window allows the user to setup the drop off box information for the PatchFile Receipt System. The IP/Hostname, and user id will be verified and a warning message will be sent back to the user if the information cannot be verified. However, the information will still get put into and stored in the NPM database, since the user/customer may not have this remote drop off box configured at the time this information is input. If the information is still incorrect at execution time of either PFRSGENREPORT or PFRSGETPATCH task, an error will occur and an alarm will be set. This information can also be set through the NPM CLUI and will execute in the same manner.

Figure 6 GUI name: PFRS TASK with preferences



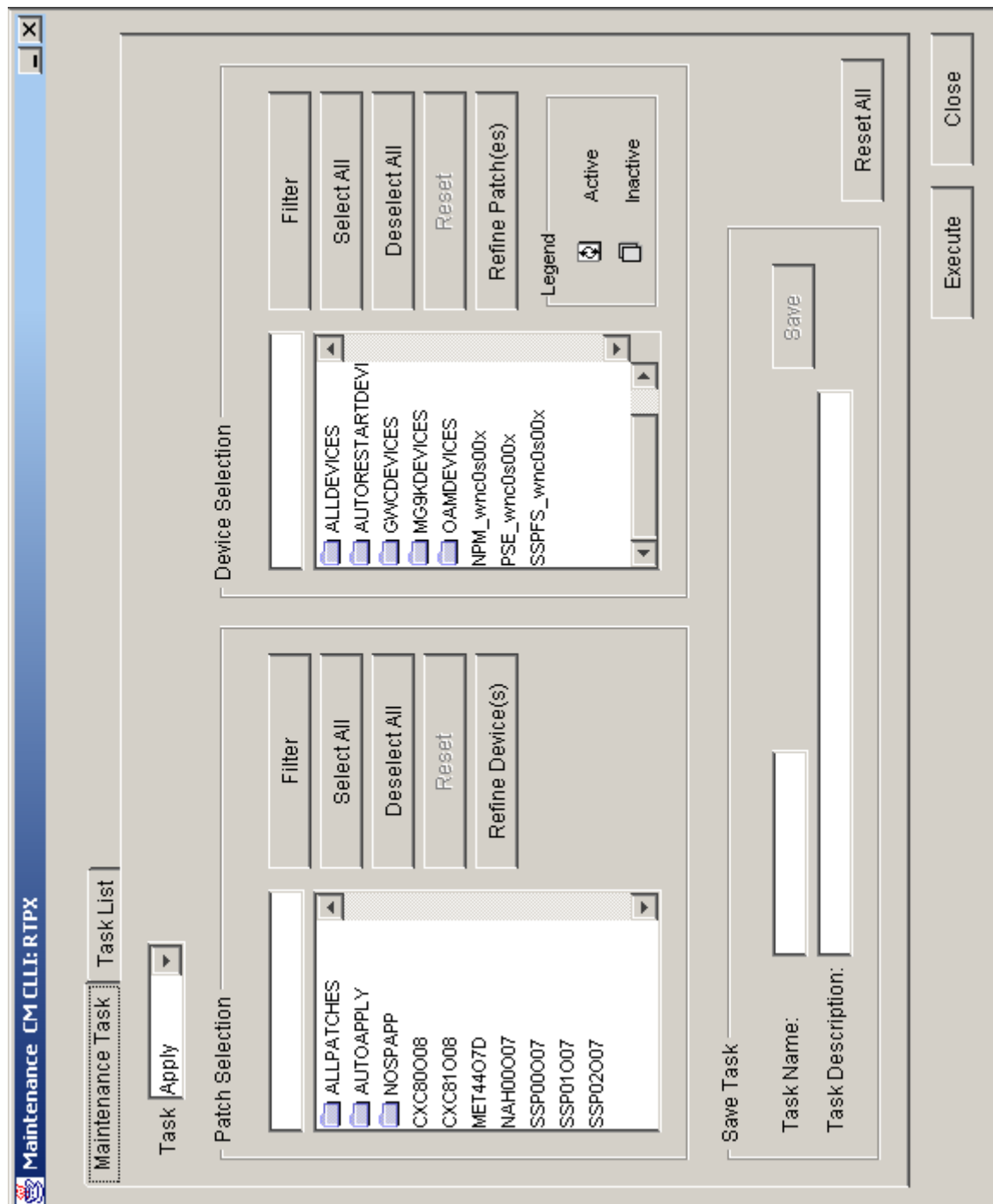
Notice the PFRS Preferences pop up window. This window is provided for each the PFRSGENREPORT and the PFRSGETPATCH task. This provides another option for the user to set up and execute either of these two tasks from the NPM GUI.

Figure 7 GUI name: Delete Task View



A new pop up window has been provided for tasks that do not contain either patches or devices. This pop up window provides the user a description of the task.

Figure 8 GUI name: Maintenance Task



Notice the new Refine Devices and Refine Patches buttons. These buttons narrow down either the devices or the patches for specific chosen patch or device.



### 3.3.3 CLUI Interface

The NPM CLUI provides the same functionality for the new PFRS access and task access as the GUI does. The following figures illustrate the commands in the NPM CLUI.

**Figure 9 NPM CLUI Command Examples**

```
npm>pfrsview

Retrieving PFRS settings...

Current PFRS Settings
-----
IP address/Hostname           : 47.142.164.252
Userid                        : FIELD
Delete Patches After Retrieval: N

npm>pfrsset 47.142.117.20 FIELD N
Enter password for drop box:
Setting PFRS preferences done

npm>qtask all

System retrieved...6
AUTOAPPLY: Autoapply Task (System Defined)
AUDIT: Audit Task (System Defined)
AUTORESTART: Autorestart Task (System Defined)
```

**Figure 10 NPM CLUI Command Examples**

```
npm>runtask PFRSGENREPORT
```

```
npm>
```

```
Reason : Passed
```

```
Detail : PFRS Gen Report was successful.
```

```
npm>pfrsset wnc0s00x FIELD N
```

```
Enter password for drop box:
```

```
Setting PFRS preferences done
```



## Baseline information

This chapter provides information on all Logs/faults, and on all operational measurements (OMs). Some information appears in NE-specific Appendices to this document. Those appendices are referenced in the text of this chapter where appropriate.

### Logs/Faults information

A log report is a record of a message that your system generates whenever a significant event has occurred in the switch or one of its peripherals. Log reports include status and activity reports, as well as reports on hardware or software faults, test results, changes in state, and other events or conditions likely to affect the performance of the switch. Either a system action or a manual action can generate a log report.

**Note:** Some of the element managers use a graphical user interface (GUI), so they display faults on the workstation monitor screen rather than generating log reports.

Alarms are generated by the system when problems or conditions are detected that can change the performance or working state of a network or network element. Daily operation of the network requires monitoring for alarms and checking that functions continue without interruption. Alarms provide notification that a system hardware or software-related event has occurred.

### Using Syslog

In SN06 an alternative is introduced to log/fault delivery from each separate element management system. Syslog can be used to aggregate some of the individual fault/log streams into the SCC2/NT STD stream on the CS 2000 Core Manager/SDM.

The network will be using syslog in several ways:

- Alarms/Faults - custlog stream - Many element managers and network elements, including SDM Platform, CS 2000 SAM21 Manager, STORM, CS 2000 GWC Manager, UAS Manager, MDM (for MG15000, previously PVG), and some CS 2000 Management Tools applications, use syslog as one mechanism for notify other systems of fault events. One consumer of those fault events is the SCC2/NT STD log converter provided on the CS2000 Core Manager/SDM. The SCC2/NT STD log converter will

collect events from those sources via the custlog format and merge those events into the SCC2/NT STD stream with the CS2000 Core fault events.

- **Audit trail** - The network is also using syslog to capture the user audit trail our network elements and element managers. The audit trail contains a history of significant user and OSS activity. Syslog is the only protocol which will contain the audit trail.
- **Security log** - The network is also using syslog to capture the security logs from our network elements and element managers. The security log contains both success and failure history of authentication and authorization activities. This stream will also contain security related events from IPSec/KCE and other key negotiation systems. Syslog is the only protocol which will contain the security log stream.
- **Debug log** - some components use syslog for diagnostic and debug information used by the Nortel support personnel. This stream is not exported beyond the EMSs and is not configured or documented for end user or customer access.

### **Alarm reporting for DMS and SPM-based equipment**

The alarm reporting system integrates event detection and alarm notification functions. An alarm becomes active when reduced service, reliability, or a test condition occurs in the network or network element. The alarm remains active until a system event or activity performed by operating company personnel clears the alarm condition. The alarm system includes audible notification and visual display through warning lights and the MAP terminal. Many alarms generate automatic logs reports when raised or cleared.

For DMS and SPM-based equipment, the MAP terminal displays alarm codes in the banner and the subsystem status summary field (SSSF). The alarm banner displays alarm codes that indicate the effect of the alarm event on the network or network element. The SSSF displays alarm codes that indicate equipment faults of system states.

### **Log Delivery Service application**

The Log Delivery Service application collects logs generated by the Communications Server 2000 (CS2000) and from the CS2000 Core Manager log stream, formats these logs, and can deliver them as a single stream to the downstream Operational Support Systems (OSS).

The CS2000 log feed includes logs for itself and all peripherals managed by it, such as: MG 4000, IW-SPM, DPT-SPM and SPM. Logs are generated locally on the CS2000 Core Manager for its own faults and status changes and are merged with the CS2000 feed. The Log Delivery Service application provides log reports in ASCII text format at a single interface for inbound or outbound TCP/IP connections.

**Log formats**

The Log Delivery service provides reports in either Switching Control Center 2 (SCC2) or Standard (STD) format. Some of the high-level differences between SCC2 format logs and STD format logs are as follows:

- SCC2 has no CS2000 identifier as found in the top left hand corner of the STD log. This field is datafilled on the CS2000 in table OFCVAR, tuple LOG\_OFFICE\_ID.
- SCC2 logs do not contain the date in the header on which the log was generated.
- SCC2 logs only give the minutes past the hour in which the log was generated, while the STD log gives the hour, minutes, and seconds.
- A critical severity log is represented by \*C in SCC2 format, and by \*\*\* in STD format.
- If applicable, the SCC2 log will have the name of the component and/or peripheral generating the log in the log header.
- When ECORE\_FORMAT (table OFCVAR on the CS2K) is enabled, SCC2 formatted logs display the optional parameter NodeName on a new line immediately following the header. This new line is not indented and has the following format: Log from node <NodeName>.
- SCC2 headers (having less information) are less likely to have the Equipment Identifier field found in some logs wrapped to the next line. (See NT STD format definition section below).

See the following example to see the difference in the formats, using a CARR811 log.

**Standard format:**

```
ASN06SWITCH * CARR811 FEB24 00:45:05 3320 TBL CARRIER SPM 39
  CKT: 63 CarrName: SPM39_STS1P_1_VT15P_1_DS1P_28
  Carrier: STS1P 1 VT15P 28 DS1P 1
  UAS-N Threshold Crossing Alert: 10
  Accumulation Interval: 0:00:10 Period: 15 minutes
  Location: SPM 39 Type: SMG4 Fabric: ATM
```

**SCC2 format:**

```
ASN06SWITCH * CARR811 FEB24 00:45:05 3320 TBL CARRIER SPM 39
  CKT: 63 CarrName: SPM39_STS1P_1_VT15P_1_DS1P_28
  Carrier: STS1P 1 VT15P 28 DS1P 1
  UAS-N Threshold Crossing Alert: 10
  Accumulation Interval: 0:00:10 Period: 15 minutes
  Location: SPM 39 Type: SMG4 Fabric: ATM
```

## NT Standard log format and definitions

NT Standard log format:

```
<SOL><LogOfficeId>_<NodeName>_<POA><Threshold><LogName><ReportNumber>_<DateIndicator>_<TimeIndicator>_<SequenceNumber>_<EventType>_<EventLabel>_<EquipmentIdentifier><EOLine><LOG BODY><EOLine><EOLog>
```

where:

- The < and > denote the beginning and end of a field.
- Bold text denotes optional fields that may or may not be there.
- \_ denotes a space delimiter between fields.
- <SOL> = Start of Log delimiter - default is 0A0D in hexadecimal for NT STD and SCC2. (Line Feed followed by Carriage Return).
- <EOLine> = End of Line delimiter - default is 0A0D in hexadecimal for NT STD and SCC2. (Line Feed followed by Carriage Return).
- <LOG BODY><EOLine> = This sequence represents 0 to n lines of text in the log body each ending with EOLine - usually each line begins following an indentation of 8 spaces.
- <EOLog> = End of Log delimiter - default (in hexadecimal) is 200A0D0A0D00 for NT STD and 0A190A0D for SCC2

### Office Identifier <LogOfficeId>:

Field Length/Format: variable length (1 to 12 characters)

Field Value(s): typically an 11-character Office CLI name

Comment: This field's value corresponds to what is datafilled in your switch's table OFCVAR, tuple LOG\_OFFICE\_ID. A maximum of 12 characters can be datafilled into the LOG\_OFFICE\_ID tuple. Normally though, the value of this tuple in customer sites matches that of the Office CLI name. The Office CLI name has a standard length of 11 characters. In the switch it is datafilled in table OFCENG, tuple OFFICE\_CLI\_NAME. (So OFFICE\_CLI\_NAME and LOG\_OFFICE\_ID would be datafilled the same). In a log sent downstream to an OSS, the Office Identifier field will be seen by the OSS as 1 word with no spaces. No padding of spaces will occur with this field to make it 12 characters. i.e. If the log\_office\_id value is 6 characters in length, the space following the field will be the delimiter to the next field.

### Node Name:

Field Length/Format: fixed length (8 characters)

Field Value(s): Node name that is left justified within the 8 character field. Padding of spaces will occur to ensure 8 character length.

Comment: This optional field is generally not recommended for implementa-

tion. The value of the field is often “CM” which has low value and the extra 9 characters (8 + space) increases the length of the header. A longer header may result in line wrapping of the Equipment Identifier field which is present in some logs. A wrapped header is difficult for OSSs to accommodate.

**Alarm Level Indicator / Priority of Action (POA) / Severity:**

Field Length/Format: fixed length (3 characters)

Field Values: '\*\*\*' or '\*\*' or '\*' or ' ' (Note the right justification of the \*s).

**Threshold:**

Field Length/Format: 1 character field (Note: there are no space delimiters before/after)

Field Value(s): A + sign if the log is thresholded. A space if the log is not thresholded.

**Log Name/Report Name/Log Prefix:**

Field Length/Format: fixed length (4 characters)

Field Value(s): The log name is right justified within the 4 character field. Padding of spaces will occur at the beginning for names less than 4 characters. E.g. 'CARR' or ' SPM'. Note that the Log Name and the Report Number are considered a single entity. i.e. The SPM300 log.

**Report Number:**

Field Length/Format: fixed length (3 characters)

Field Value(s): The number will always be 3 digits. i.e. 100 to 999.

**Date Indicator:**

Field Length/Format: fixed length (5 characters); MMMDD where MMM is JAN through to DEC and DD is 01 through to 31

Field Value(s): E.g. DEC04

**Time Indicator:**

Field Length/Format: fixed length (8 characters); HH:MM:SS where HH is 00 through 23, MM is 00 through 59, and SS is 00 through 59

Field Value(s): E.g.: 20:39:13 or 00:00:00 or 23:59:59

**Sequence Number:**

Field Length/Format: fixed length (4 characters); NNNN where the range is 0000 through 9999

Field Value(s): E.g. 0000 or 2358 or 9999. Once 9999 is reached, the number will go back to 0000. In SDM, STD\_OLD and SCC2\_OLD formats should increment the sequence number by 1 and SCC2/STD formats increment the sequence number in the same fashion as the CS2K does. In IEMS, SCC2/STD formats increment the sequence number by 1.

**Event Type:**

Field Length/Format: fixed length (4 characters);

Field Value(s): Left justified text with spaces at the end to pad to 4 character length. Examples: 'INFO', 'TBL ', 'FLT ', 'OFFL', 'SYSB', ' ', and so on.

**Event Label:**

Field Length/Format: variable length of characters; can contain more than 1 word separated by spaces

Field Value(s): E.g.: “SDM BASE MAINTENANCE”, or “CARRIER”.

**Equipment Identifier:** (last field to be considered part of the header)

Field Length/Format: fixed length (4 characters) node type, followed by a space, followed by a numeric node number

Field Value(s): Node type portion is left justified and padded with spaces at the right if less than 4 characters. The node number portion is left justified. E.g. 'SPM 0', 'LIU7 43', 'SPM 71'.

Comment: This field is not found in all logs and should be considered rare. Known log types where this field is present are CARR and in some PM logs.

**Log Body:** (Not part of header. It follows the header).

Field Length/Format: Text in the log body usually follows an indentation of 8 spaces. Each line of text is variable in length.

Field Value(s): Can be anything but each unique log should typically always get sent out the door in the same format.

**Notes**

- Not all logs have an Equipment Identifier at the end of the header. There is no list of logs that have an Equipment Identifier and it would be an exhaustive task to determine all of which they are. Known log types that make use of the Equipment Identifier are CARR and PM. Since the Event Label can be any number of words separated by spaces, there is no obvious delimiter between the Event Label and the Equipment Identifier beyond the space that will be present. There are a couple things OSSs can do with this: take the Event Label and Equipment Identifier as just 1 string of



characters OR try to extract the Equipment Identifier out of the header independently of the Event Label. Note that the latter may not always be necessary because the body of the log may mention the Node as well. The presence of the Equipment Identifier in logs appears to be very rare and appears to be an old legacy thing that was done but isn't common practice anymore.

- For logs originating from the CS2000/XA-Core/DMS, Event Types and Event Labels for specific logs can be determined on the switch using the 'logutil' tool. In logutil, the 'listreps' and 'listroute' commands can be used to view that information. Note that the presence of a log in the tool's output list of logs does not mean that the log is actually active code where an OSS will see it downstream. Some are benign logs or development not yet completed that are sometimes listed there.

#### Example

```
LOGUTIL:
>listreps spm
Log Rep.      Event                               Suppressed/
Name No. Class Type  Event Label Thresholded Syslog
-----
  SPM  650    0    PASS
  SPM  651    0    FAIL
  SPM  300    0    TBL   Device Fault Report
  SPM  331    0    TBL   Failed Device Pro...
  ....
  SPM  709    0    INFO  SPM ISDNPROT DDM ...
  SPM  710    0    INFO  SPM ISDNPROT DDM ...
XX report(s) printed
>listroute report spm 710
REPORT  SPM 710 (SPM ISDNPROT DDM Audit) IS CLASS 0
ADDED:
DELETED:
```

- An actual SDM log sample file or feed should be analyzed for determination of a log's character by character format information. For determining things such as how many carriage returns there are between logs, or where spaces are, this is crucial. Note that a log header for a specific log very rarely changes in going from one software release to the next. The only fields that could change is the Severity, Event Type, Event Label and presence of an Equipment Identifier. Changes would be as a result of a feature change or resolve an issue with those fields' values.

### Audio Codes Media Server (AMS)--available logs/faults

The following table lists the AMS logs available. The MS2010 server is for IP networks and uses the AudioCode TP-1610 card. For detailed information on logs, refer to NN10275-909, *Fault Management Log Reference*.

#### AMS Logs/Faults available

| Log/Fault | Description                                                                              |
|-----------|------------------------------------------------------------------------------------------|
| AMS300    | ac Board Resetting Cleared only by a acBoardEvBoardStarted trap; or ac Board Fatal Error |
| AMS301    | ac Board Configuration Error                                                             |
| AMS302    | ac Board Temperature Alarm                                                               |
| AMS303    | ac Feature Key Error                                                                     |
| AMS304    | ac Board Call Resources Alarm                                                            |
| AMS305    | ac Board Controller Failure Alarm                                                        |
| AMS306    | ac Board Ethernet Link Alarm                                                             |
| AMS307    | ac Board Overload Alarm                                                                  |
| AMS308    | ac Active Alarm Table Overflow                                                           |
| AMS500    | ac Board Event Board Started. This trap is a signal to clear the active alarm table.     |
| AMS501    | cgw Administrative State Change                                                          |

### Audio Provisioning Server (APS)--available logs/faults

The following table lists the APS logs available. For detailed information on logs, refer to NN10275-909, *Fault Management Log Reference*.

#### APS Logs/Faults available

| Log/Fault | Description                                 |
|-----------|---------------------------------------------|
| APS398    | Indicates a raised alarm in the APS device. |
| APS399    | Indicates an alarm clear in the APS device. |

### Compact Call Agent (CCA)--available logs/faults

The following table lists the Compact Call Agent (formerly Call Agent (CA)) Logs/Faults available. These logs were also previously referred to as 3PC. For detailed information on logs, refer to NN10275-909, *Fault Management Log Reference*.

Compact Call Agent supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled "IEMS Functionality."

For details on the SDM protocol/format, refer to FCAPS documentation NN10023-111.

### CCA Logs/Faults available

| Log/Fault                                                                                                                                              | Description                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: Call Agent</b> For details on these Logs/Faults, refer to the Fault section of documentation related to Compact CS2K, NN10023-911. |                                                                                                                                                                                  |
| CCA300                                                                                                                                                 | Response to a minor, major, or critical alarm; indicates that free space in RAM is low. Severity is determined by the amount of free space remaining.                            |
| CCA301                                                                                                                                                 | Response to a minor, major, or critical alarm; indicates one or more time segments has exceeded the threshold. Severity is determined by the number of time segments affected.   |
| CCA302                                                                                                                                                 | Response to a minor, major, or critical alarm; indicates that free space on the root file system is low. Severity is determined by the amount of free space remaining.           |
| CCA303                                                                                                                                                 | Response to minor, major, or critical alarm; indicates that one or more software processes have terminated abnormally. Severity is determined by the number of process affected. |
| CCA304                                                                                                                                                 | Response to a minor, major, or critical alarm; indicates that one or more Network File Systems is inaccessible. Severity is determined by the number of systems affected.        |
| CCA305                                                                                                                                                 | Response to a minor, major, or critical alarm; indicates that time synch is lost to one or more NTP servers. Severity is determined by the number of servers affected.           |
| CCA309                                                                                                                                                 | Response to a major or critical alarm; may be a PCI bus fault, an ECC memory fault, or a parity error. A critical alarm requires card replacement.                               |
| CCA315                                                                                                                                                 | SOS application simplex                                                                                                                                                          |
| CCA316                                                                                                                                                 | SOS application is out-of-service                                                                                                                                                |
| CCA322                                                                                                                                                 | Image test failed                                                                                                                                                                |
| CCA331                                                                                                                                                 | Unable to communicate to mate via ethernet/fiber                                                                                                                                 |
| CCA335                                                                                                                                                 | Ethernet interface down                                                                                                                                                          |
| CCA336                                                                                                                                                 | Unable to communicate to the network                                                                                                                                             |
| CCA351                                                                                                                                                 | Response to major CON and APL alarms because the mate Call Agent unit is unavailable.                                                                                            |
| CCA355                                                                                                                                                 | Response to a minor alarm; indicates the inactive unit is jammed to prevent a SWACT.                                                                                             |
| CCA362                                                                                                                                                 | Response to a minor alarm; indicates at what point one or more REx tests has failed.                                                                                             |
| CCA365                                                                                                                                                 | System REx has not started for over 7 days                                                                                                                                       |
| CCA375                                                                                                                                                 | One unit has a different CPU type than the other                                                                                                                                 |
| CCA380                                                                                                                                                 | One unit has a different committed patch file version than the other                                                                                                             |
| CCA600                                                                                                                                                 | Indicates the alarm referenced in log CCA300 has been cleared.                                                                                                                   |
| CCA601                                                                                                                                                 | Indicates the alarm referenced in log CCA301 has been cleared.                                                                                                                   |
| CCA602                                                                                                                                                 | Indicates the alarm referenced in log CCA302 has been cleared.                                                                                                                   |
| CCA603                                                                                                                                                 | Indicates the alarm referenced in log CCA303 has been cleared.                                                                                                                   |

**CCA Logs/Faults available**

| Log/Fault | Description                                                                                           |
|-----------|-------------------------------------------------------------------------------------------------------|
| CCA604    | Indicates the alarm referenced in log CCA304 has been cleared.                                        |
| CCA605    | Indicates the alarm referenced in log CCA305 has been cleared.                                        |
| CCA609    | Indicates the alarm referenced in log CCA309 has been cleared.                                        |
| CCA615    | Alarm referenced in CCA315 has been cleared                                                           |
| CCA616    | Alarm referenced in CCA316 has been cleared                                                           |
| CCA620    | Image test started                                                                                    |
| CCA621    | Image test finished                                                                                   |
| CCA631    | Able to communicate via ethernet/fiber                                                                |
| CCA635    | Ethernet interface ok                                                                                 |
| CCA636    | Able to communicate to the network                                                                    |
| CCA651    | Indicates the alarm referenced in log CCA351 is cleared and duplex operation is restored.             |
| CCA655    | Indicates the alarm referenced in log CCA355 is cleared.                                              |
| CCA660    | Response to a minor alarm; indicates that a REx test has started.                                     |
| CCA661    | REx test finished                                                                                     |
| CCA663    | REx test rejected                                                                                     |
| CCA665    | Alarm referenced in CCA365 has been cleared                                                           |
| CCA670    | Swact failover started                                                                                |
| CCA671    | Swact failover finished                                                                               |
| CCA675    | Alarm referenced in CCA375 has been cleared                                                           |
| CCA680    | Alarm referenced in CCA380 has been cleared                                                           |
| CCA685    | An INFO log which indicates that the CCA disabled OSPF in the local ERS8600 (formerly Passport 8600). |
| CCA686    | An INFO log which indicates that the CCA enabled OSPF in the local ERS8600 (formerly Passport 8600).  |

**CS2K Management Tools (CMT)--available logs/faults**

The following table lists the CS2000 Management Tools logs available. CS2K supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled "IEMS Functionality." For details on these

logs, refer to the Fault Management section of CS2K Management Tools, NN10325-900 and to NN10275-909, *Fault Management Log Reference*.

### CS2K Management Tools Logs/Faults available

| Log/Fault                         | Description                                                                                                                                                                                                                                                                 |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CMT300                            | Critical. Data is mismatched between the SESM server and the Core. The SESM audit, CS2K Data Integrity Audit, has 10 unresolved problems. To view and correct the problems, open the audit problem report from the Audit System found under the SESM Maintenance menu item. |
| CMT301                            | Critical. The GWC element manager cannot download data to GWC on recovery so the process has terminated early, and the GWC remains out of service. To clear, determine and remedy the cause of the data download failure.                                                   |
| CMT302                            | SNMP Timeout. Critical. SNMP poller cannot communicate to the network device due to an SNMP timeout.                                                                                                                                                                        |
| CMT303                            | A Critical automatically generated log upon the raising/clearing of a CMT alarm.                                                                                                                                                                                            |
| CMT399                            | Indicates a cleared alarm in the CMT device                                                                                                                                                                                                                                 |
| CMT500                            | Generated by the SESM alarm system to indicate the system is initializing.                                                                                                                                                                                                  |
| CMT501                            | Generated by the SESM alarm system upon shutdown.                                                                                                                                                                                                                           |
| CMT502                            | Generated by the SESM alarm system to inform northbound alarm clients that alarm notifications cannot be generated. This log will be sent via the SSPFS syslog feed to the customer log.                                                                                    |
| CMT600                            | Generated when an RMGC overflow condition is detected. This log is propagated to the IEMS under the "other" category.                                                                                                                                                       |
| Alarm log for Corrupt Certificate | The log lists additional detail for the Corrupt Certificate alarm.                                                                                                                                                                                                          |
| Alarm log for Changed Certificate | The log lists additional detail for the Changed Certificate alarm.                                                                                                                                                                                                          |
| Corrupt Certificate               | Minor alarm, raised when a syntax error is recognized in a Certificate or a disallowed combination of fields is present.                                                                                                                                                    |
| Duplicate Certificate             | Minor alarm, raised when more than one Certificate with the same name is detected in the Nortel or Third Party certificate directories.                                                                                                                                     |
| Delete Certificate                | Minor alarm, raised if a Certificate file is removed that has GWs associated with it.                                                                                                                                                                                       |
| Certificate Changed               | Minor alarm, raised when an existing profile is changed and one or more of the fields that are changed are not allowed.                                                                                                                                                     |

**CS2K Management Tools Logs/Faults available**

| Log/Fault                   | Description                                                                                                              |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Missing Certificate         | Minor alarm, raised when a Nortel Certificate has been removed from the Nortel directory or changed to a different name. |
| No Available Call Server IP | A Critical alarm, raised if the SESM cannot get any available C-Side IP address from the Core.                           |

**SAM21--available logs/faults**

The following table lists the SAM21 Logs/Faults available. The Shelf Controller Unit (SCU) raises alarms on behalf of itself or on behalf of the cards in the I/O slots, power sleds, fan sleds and power supply. Therefore, the alarm IDs for some of the alarms will have the same label, but the slot location that is included in the body of the alarm will indicate the actual card that is having problem. Alarms with the label IPOA are the alarms raised by the SCU with the PMC ATM card.

SAM21 supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled "IEMS Functionality." For details on the logs/faults themselves, refer to the Fault Management section of SAM21 FCAPS documentation NN10089-911 and NN10275-909, *Fault Management Log Reference*.

**SAM21 Logs/Faults available**

| Log/Fault                              | Description                                                                                                                                                                                             |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: SAM21 Platform</b> |                                                                                                                                                                                                         |
| SCU310                                 | Shelf controller unit. CPU load is high<br>Major. The One minute load average is greater than 20.<br>Critical. The five minute load average is above 15, or the fifteen minute load average is above 7. |
| SCU332                                 | Shelf controller unit. Memory usage is high<br>Major. Total free memory has fallen below 15%.<br>Critical. Total free memory has fallen below 10%.                                                      |
| SCU349                                 | Shelf controller unit Disk usage is high.<br>Major. Total free space on the root file system has fallen below 10%.<br>Critical. Total free space on the root file system has fallen below 5%.           |
| SCU346                                 | Shelf controller unit. Large number of processes abnormally terminated<br>Major. More than 4 zombie processes in system.<br>Critical. More than 15 zombie processes in system.                          |

**SAM21 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCU329    | <p>Shelf controller unit. Loss of communications either to its mate or to the SDM.</p> <p>Minor. The upper or lower serial cable connection is down.</p> <p>Major. This shelf controller cannot ping its mate through the ethernet interface</p> <p>Major. This shelf controller cannot ping the SDM, but can ping its mate</p> <p>Major. Both the lower (upper) serial cable and the mate's Ethernet are not connected.</p> <p>Major. This shelf controller cannot ping the SDM, but can ping its mate. The upper (lower) serial cable connection is down.</p> <p>Major. Both serial cable connections are down.</p> <p>Critical. Shelf cannot ping its mate or the SDM through the Ethernet interface.</p> <p>Critical. Shelf cannot ping its mate or the SDM through the Ethernet interface. The upper (lower) serial cable connection is down.</p> <p>Critical. This shelf controller cannot ping its mate through the Ethernet interface. Both serial cable connections are down. No synching of state changes are occurring.</p> <p>Critical. The shelf cannot see out at all.</p> |
| SCU335    | <p>Major: Power Supply in Sled 1/2/3 has been removed. Most likely the whole sled has been removed.</p> <p>Critical. Power Supply in Sled 1/2/3 is down. The power supply in that sled has failed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| SCU315    | <p>Major. Fan in Sled 1/2/3 has been removed. Fan has been removed from the sled, or the entire sled has been removed.</p> <p>Critical. Fan in Sled 1/2/3 is down Fan has failed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| SCU335    | <p>Critical. Power feed 1/2 is down. Either the feed has failed, or the cable has been removed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| SCU356    | <p>Critical. Mate Shelf Controller Down. Operating in Simplex Mode. The inactive SC has been detached, or Mama on the active SC has not received a ping from the inactive SC in 20 seconds.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| SCU315    | <p>Major. Temperature in Sled 1/2/3 is High. Temperature in the sled has reached about 40 degrees.</p> <p>Critical. Temperature in Sled 1/2/3 is High. Temperature in sled has reached about 50 degrees.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SCU301    | <p>Critical. Extension Bridge in Slot 15/16 is Down/Up. Depending on the actual text, one or both of the Extension Bridges has been detached and/or removed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| SCU315    | <p>Major. Diagnostic Failed during testing in a non-system card at the specified I/O Slot A diagnostic test was run, and the board failed at least one of the tests.</p> <p>Major. Diagnostic Failed due to SWACT in a non-system card at the specified I/O Slot. A diagnostic test was interrupted by a SWACT.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

**SAM21 Logs/Faults available**

| Log/Fault         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCU346            | <p>Major. Diagnostic Failed n a non-system card at the specified I/O Slot for a specified reason. The diagnostic failed due to the reason stated. (There are 11 possible statements.)</p> <p>Critical. Firmware Flashing could not connect to the non-system card at the specified I/O Slot. Either there is another process currently attached to the board, or the bus is too busy to allow the request. Auto Flash is now turned off on the SC for this slot.</p> <p>Critical. Firmware Flashing failed at downloading firmware to the non-system card at the specified I/O Slot. The firmware file does not exist on the SDM or has incorrect parameters.</p> <p>Critical. Firmware Flashing failed at validating firmware to the non-system card at the specified I/O Slot. The firmware file is corrupt on the SDM, or there was an error in the transfer.</p> <p>Critical. Firmware Flashing failed at backing up the firmware to the non-system card at the specified I/O Slot. The copy operation from one bank to the other failed. Possible bad memory.</p> <p>Critical. Firmware Flashing failed flash to the non-system card at the specified I/O Slot. Could not connect to the board after the flash.</p> <p>Critical. Provision of a non-system card at the specified I/O Slot. Provisioning of the board failed due to some system problem. System may have been abnormally busy.</p> |
| SCU500            | Reports a change in state of a card. The new state can be Unlocked, Enabled, or None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| SCU501            | Reports an equipment insertion, specifying the shelf, card, and slot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| SCU502            | Reports an equipment removal, specifying the shelf, card, and slot.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| IPOA301           | A system log in response to a loss of cell delineation (LCD) alarm from SC-IPoA card.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| IPOA302           | A system log in response to a SONET carrier fault of type AIS from the SC-IPoA card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| IPOA303           | A system log in response to an ATM connection fault from the SC-IPoA card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| IPOA304           | A system log in response to an ATM connection set fault detected by the SAM21 Element Manager.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| IPOA801           | A system log in response to an ATM CRC32 threshold fault.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| SM21300           | A system log in response to an alarm that there has been a loss of communication, and the remote network is down.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| LOS/LOF           | These section, line and path faults indicate that SONET connectivity between the SC and the far end node is unavailable on one fiber.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| AIS-L/RDI-L       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| AIS-P/RDI-P       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| LOP               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ATM Overrun Count | Indicates the number of times cells were dropped due to a shortage of buffer space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



**SAM21 Logs/Faults available**

| Log/Fault                                                                 | Description                                                                                                                                                  |
|---------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BootServerUnavailable                                                     | Indicates that the boot server cannot be reached. Severity may vary.                                                                                         |
| ATM Overrun Date                                                          | Indicates the date of the last overrun.                                                                                                                      |
| CPU load high                                                             | Major. The One minute load average is greater than 20.<br>Critical. The five minute load average is above 15, or the fifteen minute load average is above 7. |
| Disk usage high                                                           | Major. Total free space on the root file system has fallen below 10%.<br>Critical. Total free space on the root file system has fallen below 5%.             |
| Large number of processes abnormally terminated                           | Major. More than 4 zombie processes in system.<br>Critical. More than 15 zombie processes in system.                                                         |
| Loss of Communications: Serial Connection 1 (2) is down                   | Minor. The upper (lower) serial cable connection is down.                                                                                                    |
| Loss of Communications: Mate Ethernet is down                             | Major. This shelf controller cannot ping its mate through the ethernet interface.                                                                            |
| Loss of Communications: Remote network is down.                           | Major. This shelf controller cannot ping the SDM, but can ping its mate.                                                                                     |
| Loss of Communications: Mate Ethernet, Serial Connection 1 (2) is down.   | Major. Both the lower (upper) serial cable and the mate's Ethernet are not connected.                                                                        |
| Loss of Communications: Remote network, Serial connection 1 (2) is down.  | Major. This shelf controller cannot ping the SDM, but can ping its mate. The upper (lower) serial cable connection is down.                                  |
| Loss of Communications: Serial Connection 1, Serial Connection 2 is down. | Major. Both serial cable connections are down.                                                                                                               |
| Loss of Communications: Local Ethernet interface is down.                 | Critical. Shelf cannot ping its mate or the SDM through the Ethernet interface.                                                                              |

**SAM21 Logs/Faults available**

| Log/Fault                                                                               | Description                                                                                                                                                              |
|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loss of Communications: Local Ethernet interface, Serial Connection 1 (2) is down       | Critical. Shelf cannot ping its mate or the SDM through the Ethernet interface. The upper (lower) serial cable connection is down.                                       |
| Loss of Communications: Mate Ethernet, Serial Connection 1, Serial Connection 2 is down | Critical. This shelf controller cannot ping its mate through the Ethernet interface. Both serial cable connections are down. No synching of state changes are occurring. |
| Loss of Communications: All Communications Paths Down                                   | Critical. The shelf cannot see out at all.                                                                                                                               |
| Memory usage high                                                                       | Major. Total free memory has fallen below 15%.<br>Critical. Total free memory has fallen below 10%.                                                                      |
| NFSMountsDown                                                                           | Raised for any mounts that remain down after the check and attempt to re-mount.                                                                                          |
| Power supply in Sled 1/2/3 has been removed.                                            | Major. Most likely the whole sled has been removed.                                                                                                                      |
| Power supply in Sled 1/2/3 is down.                                                     | Critical. The power supply in that sled has failed.                                                                                                                      |
| Fan in Sled 1/2/3 has been removed                                                      | Major. Fan has been removed from the sled, or the entire sled has been removed.                                                                                          |
| Fan in Sled 1/2/3 is down                                                               | Critical. Fan has failed.                                                                                                                                                |
| Power Feed 1/2 is down.                                                                 | Critical. Either the feed has failed, or the cable has been removed.                                                                                                     |
| Mate Shelf Controller Down. Operating in Simplex Mode.                                  | The inactive SC has been delatched, or Mama on the active SC has not received a ping from the inactive SC in 20 seconds.                                                 |
| Temperature in Sled 1/2/3 is High                                                       | Major. Temperature in the sled has reached about 40 degrees.                                                                                                             |
| Temperature in Sled 1/2/3 is High.                                                      | Critical. Temperature in sled has reached about 50 degrees.                                                                                                              |

**SAM21 Logs/Faults available**

| Log/Fault                                            | Description                                                                                                                                                                   |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extension Bridge in Slot 15/16 is Down/Up.           | Critical. Depending on the actual text, one or both of the Extension Bridges has been detached and/or removed.                                                                |
| Diagnostic Failed at test case.                      | Major. A diagnostic test was run, and the board failed at least one of the tests.                                                                                             |
| Diagnostic Failed due to SWACT                       | Major. A diagnostic test was interrupted by a SWACT.                                                                                                                          |
| Diagnostic Failed, xxxxxx                            | Major. The diagnostic failed due to the reason stated. (There are 11 possible statements.)                                                                                    |
| Firmware Flashing could not connect to the board.    | Critical. Either there is another process currently attached to the board, or the bus is too busy to allow the request. Auto Flash is now turned off on the SC for this slot. |
| Firmware Flashing failed at down-loading firmware    | Critical. The firmware file does not exist on the SDM or has incorrect parameters.                                                                                            |
| Firmware Flashing failed at validating firmware      | Critical. The firmware file is corrupt on the SDM, or there was an error in the transfer.                                                                                     |
| Firmware Flashing failed at backing up the firmware. | Critical. The copy operation from one bank to the other failed. Possible bad memory.                                                                                          |
| Firmware Flashing failed flash                       | Critical. Could not connect to the board after the flash.                                                                                                                     |
| Provision failed: process ended abnormally.          | Critical. Provisioning of the board failed due to some system problem. System may have been abnormally busy.                                                                  |
| Provision failed, could not connect to board.        |                                                                                                                                                                               |
| Provision failed to set application type.            |                                                                                                                                                                               |
| UnderlyingResourceUnavailable                        | A minor alarm when it indicates that an application card is locked and is not available, but a major alarm when it indicates that an application card is being autorecovered. |

**CS2000--available logs/faults**

The following table lists the CS 2000 Logs/Faults available.

CS 2000 supports SCC2 or NT STD formatted logs through SDM

functionality, or it can be supported through IEMS. The SDM would remain the CS2000 Core Manager but can forward the CS2000 logs to IEMS instead of directly to the OSS. For details on the IEMS interface, refer to the chapter in this document titled “IEMS Functionality.” For details on the logs/faults themselves, refer to the Fault Management section of CS 2000 FCAPS documentation, NN10083-911. For information on XA-Core logs and faults, refer to NTP 297-8991-810, *XA-Core Reference Manual* and NN10275-909, *Fault Management Log Reference*.

#### CS2000 Logs/Faults available

| Log/Fault                              | Description                                                                                                                                                                          |                                                                                                                                                                                   |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: CS2000 XA-Core</b> |                                                                                                                                                                                      |                                                                                                                                                                                   |
| ABI messaging alarms                   | Links down                                                                                                                                                                           | ABI external messaging alarm Links Down - Alarm Set (or Alarm cleared).                                                                                                           |
|                                        | Severely Degraded                                                                                                                                                                    | ABI external messaging alarm Severely Degraded - Alarm Set (or Alarm cleared).                                                                                                    |
|                                        | Degraded                                                                                                                                                                             | ABI external messaging alarm Degraded - Alarm Set (or Alarm cleared).                                                                                                             |
| Alarm Database logs                    | Report Alarm Log                                                                                                                                                                     | Sent when requested by the entity that is reporting an alarm.                                                                                                                     |
|                                        | Clear Alarm Log                                                                                                                                                                      | Generated when a client clears an existing alarm in the alarms database managed by Alarmd.                                                                                        |
|                                        | Alarm Summary Log                                                                                                                                                                    | Sent periodically by Alarmd to summarize the Alarms in the database managed by Alarmd.                                                                                            |
| ATM log                                | ATM606                                                                                                                                                                               | Generated when the network receives a UNI Release Complete message informing the craftsperson of an unsuccessful attempt to set up ATM bearer path (SVC) through the ATM network. |
| AUDT logs                              | AUDT105                                                                                                                                                                              | Trunk state incorrect.                                                                                                                                                            |
|                                        | AUDT106                                                                                                                                                                              | Call is forced down due to the release of a trunk.                                                                                                                                |
|                                        | AUDT109                                                                                                                                                                              | Trouble conditions detected.                                                                                                                                                      |
|                                        | AUDT110                                                                                                                                                                              | Terminal trunk state is invalid.                                                                                                                                                  |
|                                        | AUDT116                                                                                                                                                                              | Terminal state indicator (TSI) of an idle trunk is invalid.                                                                                                                       |
|                                        | AUDT117                                                                                                                                                                              | TSI (terminal state indicator) of a given call state and the CCB (call condense block) TSI do not match.                                                                          |
|                                        | AUDT209                                                                                                                                                                              | Generated whenever the audit process finds a problem with a multi CPTLB.                                                                                                          |
| Authorization logs                     | SESM MI2 applications have user authorization by group. Authorization failures generate logs through the SSPFS log reporting service.                                                |                                                                                                                                                                                   |
| Baseline alarm                         | “Baseline” alarm is raised whenever any XA-Core Field Replaceable Unit (FRU) installed in the shelf is not at Hardware (HW) or Firmware (FW) baseline. Only the Major level is used. |                                                                                                                                                                                   |
| BKM logs                               | BKM600                                                                                                                                                                               | Generated if a system backup is successful.                                                                                                                                       |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | BKM601 Generated if a system backup fails.                                                                                                                                                                                                                          |
|           | class_security.ver01 Generated when a user attempts to invoke the Backup Manager and does not have the correct permissions.                                                                                                                                         |
| C7UP logs | C7UP100 No acknowledgment received from far-end office after circuit reset, group circuit reset, blocking or unblocking, group blocking or unblocking, or release messages. For field descriptions and actions, see Logs Reference Manual (Volume 1), 297-2621-840. |
|           | C7UP101 Unreasonable message received on trunk.                                                                                                                                                                                                                     |
|           | C7UP102 CCS7 connection is released due to abnormal condition.                                                                                                                                                                                                      |
|           | C7UP103 Blocked or unblocked circuit conditions.                                                                                                                                                                                                                    |
|           | C7UP104 Group blocking or unblocking conditions.                                                                                                                                                                                                                    |
|           | C7UP105 Unsuccessful ISDN call attempt.                                                                                                                                                                                                                             |
|           | C7UP106 Shortage of resources.                                                                                                                                                                                                                                      |
|           | C7UP107 Request for continuity check test by an IAM (Initial Address Message), a continuity check request (CCR) message, or a demand continuity test (DCT) from the MAP.                                                                                            |
|           | C7UP109 ISUP trunk state change to match far-end office trunk state.                                                                                                                                                                                                |
|           | C7UP110 Serious communication problem with far-end office.                                                                                                                                                                                                          |
|           | C7UP111 Outgoing call attempt failure.                                                                                                                                                                                                                              |
|           | C7UP112 Call in progress has received an unreasonable message in the current call state.                                                                                                                                                                            |
|           | C7UP113 ISUP trunk maintenance problem.                                                                                                                                                                                                                             |
|           | C7UP114 Response from far-end office not received from a REL (circuit release) or RSC (reset circuit) message.                                                                                                                                                      |
|           | C7UP119 ISUP has not received, from the far-end office, second GRS (circuit group reset), CGB (circuit group blocking), or CGU (circuit group unblocking) message.                                                                                                  |
|           | C7UP120 ISUP invalid number in circuit-group message RANGE field (0 or a number greater than 23).                                                                                                                                                                   |
|           | C7UP130 System has detected that the hop counter (HC) limit has been exceeded. For details, see Logs Reference Manual (Volume 2), 297-2621-840 and the CS2000 fault information.                                                                                    |
|           | C7UP300 ISUP trunk time-out waiting for acknowledgement from first RLC (remote line controller).                                                                                                                                                                    |
|           | C7UP301 System has received a release message with the value "Exchange Routing Error."                                                                                                                                                                              |

**CS2000 Logs/Faults available**

| Log/Fault                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CARR logs                            | <p>CARR300 Carrier failure event occurred. Also applies to STS-1 carrier. For more info, see general SPM fault information.</p> <p>CARR310 Carrier failure events are cleared. Also applies to an STS-1 carrier. For more info, see general SPM fault information.</p> <p>CARR330 A protection switch has occurred. A previously inactive carrier in the protection group takes over as the active carrier.</p> <p>CARR331 A protection switch was attempted but failed.</p> <p>CARR340 The inactive carriers in a protection group have changed state in such a way that they cannot carry traffic. The protection group is now running in simplex mode.</p> <p>CARR341 Both carriers have become available and normal protection switching can occur.</p> <p>CARR500 Carrier state change to InSv from ManB or SysB. For more info, see general SPM fault information.</p> <p>CARR501 Carrier state change to CBsy from ManB or SysB. For more info, see general SPM fault information.</p> <p>CARR510 Carrier state change to SysB from InSv or CBsy. For more info, see general SPM fault information.</p> <p>CARR511 Carrier state change to SysB from InSv or CBsy. For more info, see general SPM fault information.</p> <p>CARR512 OC3 carrier state change to CBsy from InSv, ManB, or SysB. For more info, see IW-SPMgeneral SPM fault information.</p> <p>CARR600 Value of an instance of apsChanSwitchover increments.</p> <p>CARR800 Threshold crossing alert (TCA) for a metered performance parameter has been cleared. For more info, see general SPM fault information.</p> <p>CARR810 TCA event for metered performance parameter has occurred. For more info, see general SPM fault information.</p> <p>CARR811 TCA event for non-metered performance parameter has occurred. Also applies to STS-1 carrier on MG4000. For more info, see general SPM fault information.</p> |
| CICM logs                            | <p>Component initializes on master An INFO log for a normal start-up event.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Component initializes on slave       | An INFO log for a normal start-up event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Slave component requests a bulk sync | An INFO log for a normal start-up event.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

**CS2000 Logs/Faults available**

| <b>Log/Fault</b>                                                                          |         | <b>Description</b>                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bulk sync of data completes                                                               |         | An INFO log for a normal start-up event.                                                                                                                                                                                          |
| Component on master receives notification to SWACT                                        |         | An INFO log generated as components perform an operator-initiated switch of activity.                                                                                                                                             |
| Component on slave receives request from its counterpart to assume the role of the master |         | An INFO log generated as components perform an operator-initiated switch of activity.                                                                                                                                             |
| Component on slave completes transition to active                                         |         | An INFO log generated as components perform an operator-initiated switch of activity.                                                                                                                                             |
| Component on master receives acknowledgment from mate that it is now active               |         | An INFO log generated as components perform an operator-initiated switch of activity.                                                                                                                                             |
| CEM logs                                                                                  | CSEM300 | The log that encapsulates CS2K logs which have severity and are part of set and clear pairs.                                                                                                                                      |
|                                                                                           | CSEM600 | The log that encapsulates CS2K log which do not have severity.                                                                                                                                                                    |
| CRTM logs                                                                                 | CRTM700 | An INFO log which indicates that the user has requested a new private key.                                                                                                                                                        |
|                                                                                           | CRTM701 | An INFO log which indicates that the user selected to generate a self-signed certificate.                                                                                                                                         |
| Database logs                                                                             | DB600   | Generated when an attempt to allocate a database connection encounters an I/O error. These errors can occur when the database has been stopped momentarily for administrative purposes.                                           |
|                                                                                           | DB601   | Generated when an attempt to allocate a database connection encounters detects that the connection is already closed. These errors can occur when the database has been stopped momentarily and then again started.               |
|                                                                                           | DB602   | Generated when an attempt to allocate a database connection encounters an invalid password error. These errors can occur when the database log in password for a database user is changed.                                        |
|                                                                                           | DB603   | Generated when an attempt to allocate a database connection encounters maximum database sessions exceeded error. These errors can occur when an unusual event has occurred that caused sustained high levels of system activity.  |
|                                                                                           | DB604   | Generated when an attempt to allocate a database connection encounters maximum database processes exceeded error. These errors can occur when an unusual event has occurred that caused sustained high levels of system activity. |

**CS2000 Logs/Faults available**

| <b>Log/Fault</b>            |                                                         | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|---------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Server<br>process logs |                                                         | Desc Msg: Could not read switch name                                                                                                                                                                                                                                                                                                                                                                                |
|                             |                                                         | Desc Msg: Could not create tuple                                                                                                                                                                                                                                                                                                                                                                                    |
|                             |                                                         | Desc Msg: Could not read VRINV table                                                                                                                                                                                                                                                                                                                                                                                |
|                             |                                                         | Desc Msg: Could not initialize OM Access                                                                                                                                                                                                                                                                                                                                                                            |
|                             |                                                         | Desc Msg: Could not initialize OM Access                                                                                                                                                                                                                                                                                                                                                                            |
|                             |                                                         | Desc Msg: Could not get keyinfo object, excluding group, <group>                                                                                                                                                                                                                                                                                                                                                    |
|                             |                                                         | Desc Msg: Could not get key, excluding group, <group>                                                                                                                                                                                                                                                                                                                                                               |
|                             |                                                         | Desc Msg: Could not get info, excluding group, <group>                                                                                                                                                                                                                                                                                                                                                              |
|                             |                                                         | Desc Msg: Could not register initialization timer                                                                                                                                                                                                                                                                                                                                                                   |
|                             |                                                         | Desc Msg: Rejecting register request for excluded group: <group>                                                                                                                                                                                                                                                                                                                                                    |
|                             |                                                         | Desc Msg: Could not open listening connection                                                                                                                                                                                                                                                                                                                                                                       |
|                             |                                                         | Desc Msg: Could not open listening connection: <service name>                                                                                                                                                                                                                                                                                                                                                       |
| DBSE log                    | DBSE300                                                 | A Session Server Provisioning Trouble (TBL) log which is generated any time a change in database connectivity is detected. It reports 'No Solid DB Connection' when database connectivity is lost. It reports 'Solid DB Connection Restored' when database connectivity is reestablished. Correlates to the critical alarm "No Database Connection" raised when a loss of connectivity to the database is detected. |
| DQoS alarm                  | This raises a DQoS link alarm when link failure occurs. |                                                                                                                                                                                                                                                                                                                                                                                                                     |
| EMJS logs                   | EMJS340                                                 | Raise/Clear Alarms for the state of SNMP Communication with the device during its OM Collection.                                                                                                                                                                                                                                                                                                                    |
|                             | EMJS341                                                 | Log for Complete failure of SNMP Collection Job                                                                                                                                                                                                                                                                                                                                                                     |
|                             | EMJS350                                                 | FTP/SFTP/STREAM communication Failure Event per device.                                                                                                                                                                                                                                                                                                                                                             |
|                             | EMJS360                                                 | Raise or Clear log for the error occurred in generating a Report File.                                                                                                                                                                                                                                                                                                                                              |
|                             | EMJS371                                                 | Raise or Clear log for the error/successful execution of Transfer jobs. Or, Raise log for Transmit failures during FTP or SFTP.                                                                                                                                                                                                                                                                                     |
|                             | EMJS540                                                 | Collection Job State Changed Logs. Executed. Stopped. Disabled.                                                                                                                                                                                                                                                                                                                                                     |
|                             | EMJS560                                                 | Report Job State Changed Logs. Executed. Stopped. Disabled.                                                                                                                                                                                                                                                                                                                                                         |
|                             | EMJS570                                                 | Report Job State Changed Logs. Executed. Stopped. Disabled.                                                                                                                                                                                                                                                                                                                                                         |
|                             | EMJS607                                                 | Log for MDM Performance & Fault Swact.                                                                                                                                                                                                                                                                                                                                                                              |
|                             | EMJS640                                                 | Log for: Invalid Template Version. Invalid OIDs for the device. Invalid CVS File Format.                                                                                                                                                                                                                                                                                                                            |
|                             | EMJS641                                                 | Log Successful processing of SNMP Collection Job.                                                                                                                                                                                                                                                                                                                                                                   |
|                             | EMJS642                                                 | Partial/Complete Failure of SNMP Collection Job.                                                                                                                                                                                                                                                                                                                                                                    |



**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMJS651   | Log for Successful Processing of CSV Collection Job.                                                                                                                                                                                                                                                                                                                                                                                          |
| EMJS652   | Log for Partial/Complete failure in processing of CSV Collection Job.                                                                                                                                                                                                                                                                                                                                                                         |
| EMJS661   | Log for complete success for Report Job.                                                                                                                                                                                                                                                                                                                                                                                                      |
| EMJS662   | Log for partial/complete failure for Report Job.                                                                                                                                                                                                                                                                                                                                                                                              |
| EMJS671   | Log for Successful transfer job Attempts.                                                                                                                                                                                                                                                                                                                                                                                                     |
| EMJS672   | Log for partial/complete failure of transfer job attempts.                                                                                                                                                                                                                                                                                                                                                                                    |
| EMJS840   | Threshold raise alarm.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| EMJS841   | Threshold clear Alarm.                                                                                                                                                                                                                                                                                                                                                                                                                        |
| EMSS logs | EMSS300 Produced when ever the client side PAM + RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                   |
|           | EMSS301 Produced when ever a serious problem is detected by the RADIUS Server in the process of handling a given authentication request. Problems that fall into this category are unexpected exceptions thrown by RADIUS Server plug-ins (as a result perhaps of improper RADIUS server setup/configuration or a critical RADIUS server dependency being unavailable). Recovery Action: Check the status of Sun IS and restart if necessary. |
|           | EMSS302 Produced when the radius server policy plugin detects no single-sign-on token is available indicating there is a problem with the Sun Identity Server or that it is in fact not running.                                                                                                                                                                                                                                              |
|           | EMSS303 Indicates a communication failure with the PAM+Radius group daemon. This log indicates that the pam_radius_auth cannot establish or maintain a communications session with the group daemon on the client machine.                                                                                                                                                                                                                    |
|           | EMSS304 Produced when the pam_mkhomedir module invokes the script mkhomedir but the script does not return within the timeout time (default 30 seconds).                                                                                                                                                                                                                                                                                      |
|           | EMSS305 Produced when ever the client side PAM+ RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                    |
|           | EMSS306 Produced when ever the client side PAM+ RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                    |
|           | EMSS307 Produced when ever the client side PAM+ RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                    |
|           | EMSS308 Produced when ever the client side Pam + RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                   |
|           | EMSS309 Produced when ever the client side PAM+ RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                    |
|           | EMSS310 Produced when ever the client side PAM+ RADIUS SPI is unable to communicate with the server-side RADIUS Interface.                                                                                                                                                                                                                                                                                                                    |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                       |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMSS311   | Produced when ever the client side PAM+ RADIUS SPI is unable to read information for required to communicate with the configured RADIUS server(s) from the /etc/raddb/server file |
| EMSS312   | Produced when ever the pam_mkhomedir module tries to get the user information from NSSwitch by using getpwnam and fails.                                                          |
| EMSS313   | Produced when ever the radius server health monitor detects the radius process is not functional.                                                                                 |
| EMSS314   | Produced when ever the identity server health monitor detects the identity server process is not functional.                                                                      |
| EMSS315   | Produced when ever the PAM login servlet health monitor detects the PAM login servlet is not functional.                                                                          |
| EMSS316   | Produced when ever the pam_mkhomedir module checks the ownership of the script and the script is not owned by the user root.                                                      |
| EMSS317   | Produced when ever the pam_mkhomedir module tries to get the script and the script is not there.                                                                                  |
| EMSS318   | Produced when ever the pam_mkhomedir module tries to check the euid of the current process and finds the euid is not root.                                                        |
| EMSS319   | Produced when ever the module tries to get the configuration file and the file is not there.                                                                                      |
| EMSS320   | Produced when ever the module tries to read the contents of the configuration file but fails.                                                                                     |
| EMSS321   | Produced when ever the module tries to get the auth url but the url got is null.                                                                                                  |
| EMSS322   | Produced when ever the module is timed out during the authentication. The default timeout is 30 seconds.                                                                          |
| EMSS323   | Produced when ever the module tries to get the configuration file and the file is not there.                                                                                      |
| EMSS324   | Produced when ever the module tries to read the contents of the configuration file but fails.                                                                                     |
| EMSS325   | Produced when ever the module tries to get the auth url but the url got is null.                                                                                                  |
| EMSS326   | Produced when ever the module is timed out during the validation. The default timeout is 30 seconds.                                                                              |
| EMSS327   | Produced when ever the script has an error to access the directory or files.                                                                                                      |
| EMSS330   | Produced when ever the module failed to initialize single sign on facility. SSO tokens will not be generated.                                                                     |
| EMSS331   | Produced when ever the module could not authenticate user due to unhandled internal error.                                                                                        |
| EMSS332   | Produced when ever there is no single-sign-on token available after authentication.                                                                                               |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                        |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EMSS333   | Produced when ever the module could not generate single-use tokens due to unhandled internal error.                                                                                                |
| EMSS334   | Produced when ever the module could not read user's unix profile due to unhandled internal error.                                                                                                  |
| EMSS351   | Produced when ever an exception is caught while making request to the servlet.                                                                                                                     |
| EMSS352   | Produced when ever the module failed to authenticate.                                                                                                                                              |
| EMSS353   | Produced when ever there is an error processing response from the servlet.                                                                                                                         |
| EMSS354   | Produced when ever the module failed to attempt to access the shadow database by user with uid <uid>.                                                                                              |
| EMSS360   | Produced when ever the module failed to initialize SAML.                                                                                                                                           |
| EMSS361   | Produced when ever the module failed to process the configuration file.                                                                                                                            |
| EMSS362   | Produced when ever the module failed to configure log4cpp.                                                                                                                                         |
| EMSS363   | Produced when ever the module failed to read the "password_file" property from the configuration file.                                                                                             |
| EMSS364   | Produced when ever the module failed to find the configuration file.                                                                                                                               |
| EMSS600   | An INFO log produced when ever the PAM Radius daemon modifies the /etc/passwd or /etc/group files.                                                                                                 |
| EMSS601   | An INFO log produced when ever there are successful or failed authentication requests of the authentication module.                                                                                |
| EMSS602   | An INFO log produced when there are successful or failed PAM SPI events from PAM + Plug-Ins.                                                                                                       |
| EMSS603   | An INFO log that indicates a SunOne Identity Server Single Sign On (SSO) token activity for a token create event. Sensitive token information is not included in these logs.                       |
| EMSS604   | An INFO log that indicates a SunOne Identity Server Single Sign On (SSO) token activity for a token destroy event. Sensitive token information is not included in these logs.                      |
| EMSS605   | An INFO log that indicates a SunOne Identity Server Single Sign On (SSO) token activity for a token timeout event. Sensitive token information is not included in these logs.                      |
| EXT log   | EXT108 Generated upon raising and clearing of EXT alarm HIGH_MEM_BLOCKING.                                                                                                                         |
| EXT alarm | HIGH_MEM_BLOCKING Appears at the MAPCI EXT alarm banner when there is a high memory blocking level detected in the system. Correlates to XACP300 log when raised, and to XACP500 log when cleared. |
| FPS log   | FPS100 Generated when the FPS counter of a subscriber is loaded.                                                                                                                                   |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GAME logs | GAME101 Created if the RSPTMOUT OM count is greater than zero. The log is created during the RSPTMOUT OM transfer period and records the RSPTMOUT OM count value.                                        |
|           | GAME102 Created if RSPTMOUT OM count becomes equal to the office parm T1_TIMER _EXPIRY_MSG_SUPPRESS threshold value.                                                                                     |
| IAA logs  | IAA314 Generated whenever an IAA module fails to initialize. The reason text field may contain one of 7 possible strings.                                                                                |
|           | IAA342 Generated whenever an IAA module cannot communicate with other IAA modules, i.e., EMDA.                                                                                                           |
|           | IAA343 Generated when a PCEM processing error occurs. The reason text field may contain one of 6 possible strings.                                                                                       |
|           | IAA344 Generated when an IAA module cannot create an audit entry.                                                                                                                                        |
|           | IAA345 Generated when an IAA module detects a configuration problem. The reason text field may contain one of 2 possible strings.                                                                        |
|           | IAA346 Generated when an IAA cannot communicate to the downstream RKS pair or DF. The reason text field may contain one of 4 possible strings.                                                           |
|           | IAA347 Generated when an IAA module detects a problem when trying to manage its filesystem storage.                                                                                                      |
|           | IAA641 Generated when an IAA module goes into service.                                                                                                                                                   |
|           | IAA646 Generated when communications between the IAA and the downstream RKS pair or DF has been restored.                                                                                                |
|           | IAA701 Generated when the data being process by the IAA is corrupted.                                                                                                                                    |
| IEMS logs | IEMS398 Raise Log for a Loss of Communication with the EMS/NE                                                                                                                                            |
|           | IEMS399 Clear Log for regain of Communication with the EMS/NE                                                                                                                                            |
|           | IEMS601 Traps From Unknown Device Log                                                                                                                                                                    |
|           | IEMS602 Unknown Traps from Known Device Log                                                                                                                                                              |
|           | IEMS603 Missed Notifications Log                                                                                                                                                                         |
|           | IEMS604 Clear Events without raise (Only for clear notifications that doesn't have log name and log number).                                                                                             |
|           | IEMS605 Log for Manually Cleared Alarms by the user in IEMS GUI                                                                                                                                          |
|           | IEMS606 Log generated by DBCleanUpPolicy. Threshold crossed log. Log for Data clean up                                                                                                                   |
|           | IEMS607 Automatic Clear alarms by IEMS during resynchronization of alarms.                                                                                                                               |
|           | IEMS608 Generated when an alarm in IEMS has been cleared automatically due to an aging policy coming due. In SN08, by default the ERS8600 (formerly Passport 8600) has a 7 day aging policy implemented. |

**CS2000 Logs/Faults available**

| Log/Fault                                               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| IEMS Sec-<br>urity logs                                 | IEMS609      Generated by IEMS when it clears the entire active alarm list for a managed component. Generally this might happen for SNMP managed devices when they send a cold start trap. OSSs can use this log as an indicator that IEMS no longer considers the alarms against that component valid and has removed them. The OSS may wish to consider clearing the trouble tickets against that managed component.                                          |
|                                                         | IEMS610      Generated by IEMS when the /data disk partition of the SSPFS platform in which it resides exceeds 80% utilization and the disk space cleanup job detects it. When detected, IEMS will attempt to bring /data under 80% utilization by removing OM report directories under /data/oms. Sub-directories will be removed as required and will start with the oldest first (that named 7), then 6 and end with 2. The 1 directory will not be removed. |
|                                                         | Generated for any unauthorized configuration access attempts of measurement collection jobs.                                                                                                                                                                                                                                                                                                                                                                    |
|                                                         | Generated for any unauthorized configuration access attempts of measurement transfer jobs.                                                                                                                                                                                                                                                                                                                                                                      |
|                                                         | Generated for any unauthorized configuration access attempts of measurement report jobs.                                                                                                                                                                                                                                                                                                                                                                        |
|                                                         | Generated when a tuple is added for the IP address in the security server.                                                                                                                                                                                                                                                                                                                                                                                      |
| logNormaliz<br>er and log<br>NormSAF<br>Process<br>logs | Generated when the RADIUS secret is updated for the IP address in the security server.                                                                                                                                                                                                                                                                                                                                                                          |
|                                                         | Generated when a delete operation occurs for the IP address in the security server.                                                                                                                                                                                                                                                                                                                                                                             |
|                                                         | Desc Msg: Event file <EventFileName> was not found ...logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | Desc Msg: Event delimiter cannot be more than one character long ...logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                       |
|                                                         | Desc Msg: Event file "<<EventFileName<<" is empty ..logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                         | Desc Msg: Event file "<<EventFileName<<" had errors..logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                         | Desc Msg: Mapper file "<<MapperFileName<<" was not found...logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                                |
|                                                         | Desc Msg: Mapper delimiter cannot be more than one character long...logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                       |
|                                                         | Desc Msg: Mapper file "<<MapperFileName<<" is empty..logNormalizer exiting                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                         | Desc Msg: Mapper file "<<MapperFileName<<" has errors.."<<argv[0]<<" exiting                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                         | Desc Msg: Mapping information parsing error for log "<<logName<<" empty information or wrong delimiter used                                                                                                                                                                                                                                                                                                                                                     |
|                                                         | Desc Msg: output file "<<outputFileName<<" could not be opened                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                                         | Desc Msg: lostLogFile "<<lostLogFileName<<" could not be opened                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                                         | Desc Msg: lostLogFile "<<outputFileName<<" is empty                                                                                                                                                                                                                                                                                                                                                                                                             |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           | <p>Desc Msg: lostLogFormat string is empty</p> <p>Desc Msg: lostLogTriggerSize is empty</p> <p>Desc Msg: lostLogVisibleMsg string is empty</p> <p>Desc Msg: lostLogVisLog string is empty</p> <p>Desc Msg: sdmLogList is empty</p> <p>Desc Msg: probeTimer string is empty</p> <p>Desc Msg: checkLen string is empty</p> <p>Desc Msg: No Lost Log Trigger message has been specified</p> <p>Desc Msg: Could not send events to agent. Agent removed from output list</p> <p>Desc Msg: Unknown log format. No mapping will be done for input</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| LOST logs | <p>LOST101      Generated when an outgoing message fails to find an open path to the destination or an incoming message fails checks done by the receiving application.</p> <p>LOST102      Generated when an incoming message cannot be forwarded to Call Processing because software resources (buffers) have been exhausted or the limit for outstanding messages has been exceeded and no additional messages can be enqueued.</p> <p>LOST103      Generated when a message that originated from the CM is rebounded back to the CM for additional processing because a node intermediate along the path was unable to deliver the message to the final destination. The failure code instructs the CM to attempt to re-route the message over an alternate path but the original message contains the re-route inhibit flag</p> <p>LOST104      Generated when an outgoing message fails a VID-to-TID translation or an incoming message fails sanity checks on the terminal identifier (TID).</p> <p>LOST105      Generated when an outgoing message fails to find an open CM-MS link. Also generated when a message that originated from the CM is rebounded back to the CM for additional processing because a node intermediate along the path was unable to deliver the message to the final destination. The failure code instructs the CM to attempt to re-route the message over an alternate path but sanity checks fail on the original route.</p> <p>LOST106      Generated when a message fails application sanity checks. Also generated when a message that originated from the CM is rebounded back to the CM for additional processing because a node intermediate along the path was unable to deliver the message to the final destination. The failure code indicates "unspecified reason."</p> <p>LOST107      Generated when an incoming message specifies an unassigned terminal identifier (TID).</p> |

**CS2000 Logs/Faults available**

| Log/Fault         | Description                                                                                                                                                                                                                                                                                                                                                                    |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| LOST108           | Generated when the buffer (containing an outgoing message) is reclaimed by a system audit. The message is deemed to be stale as the buffer has not been accessed for a long period of time.                                                                                                                                                                                    |
| LOST109           | Generated when a message that originated from the CM is rebounded back to the CM for additional processing because a node intermediate along the path was unable to deliver the message to the final destination. The failure code instructs the CM to attempt to re-route the message over an alternate path but all alternatives have been previously tried without success. |
| LOST110           | Generated when Call Processing gets a failure indication on attempting to output a message).                                                                                                                                                                                                                                                                                   |
| LOST111           | Generated when an incoming message cannot be delivered. The specific failure reason is displayed in the log.                                                                                                                                                                                                                                                                   |
| LOST112           | Generated when an outgoing message fails sanity checks on length or an incoming message fails sanity checks on length.                                                                                                                                                                                                                                                         |
| LOST113           | Generated when the needed software resources are again available. The log displays the number of discarded events during the period of exhausted resources                                                                                                                                                                                                                     |
| LOST114           | Generated when an incoming (BFP) message cannot be forwarded to Call Processing due to message buffer exhaustion. This is similar to the more generic LOST102 log                                                                                                                                                                                                              |
| LOST115           | Generated when the (BFP) buffer (containing an incoming message) is reclaimed by a system audit. The message is deemed to be stale as the buffer has not been accessed for a long period of time. This is similar to the more generic LOST108 log.                                                                                                                             |
| LOST116           | Generated when an outgoing message encounters a failure. The specific failure reason is displayed in the log                                                                                                                                                                                                                                                                   |
| LOST117           | Generated when an outgoing message encounters a failure. The specific failure reason is displayed in the log.                                                                                                                                                                                                                                                                  |
| Media Proxy alarm | Media Proxy Communications Failure<br>Severity varies, based on the number of media proxies that are out of service as compared to the number of media proxies provisioned checked on a 5-minute polling period.<br>Critical - Over 50% of media proxies disabled.<br>Major - Over 20% of media proxies disabled.<br>Minor - Any media proxies disabled.                       |
| NGSS logs         | NGSS700<br>Indicates when a SIPT CS2CS call is rejected because it would exceed the LIMIT setting of the CS2B0008 SOC.                                                                                                                                                                                                                                                         |
|                   | NGSS701<br>Generated when a CS2AS call is rejected because it would exceed the LIMIT setting of the CS2B0009 SOC. The SIPT call is not allowed to complete through the NGSS. The CS2ASOV register in OM group NGSSOM is pegged.                                                                                                                                                |

**CS2000 Logs/Faults available**

| Log/Fault                       | Description                                                                           |
|---------------------------------|---------------------------------------------------------------------------------------|
| NLClient logs and NLServer logs | Desc Msg: Failed to register for connection to export Server at service<service name> |
|                                 | Desc Msg: Failed to register for connection to Data Server at port <port number>      |
|                                 | Desc Msg: Failed to register for connection to Data Server at service <service name>  |
|                                 | Desc Msg: Failed to register for signals                                              |
|                                 | Desc Msg: Failed to send error                                                        |
|                                 | Desc Msg: Communications not initialized                                              |
|                                 | Desc Msg: Input from unknown end point                                                |
|                                 | Desc Msg: Failed to send registration message to Data Server                          |
|                                 | Desc Msg: Failed to send deregistration message to Data Server                        |
|                                 | Desc Msg: Invalid Message from archive                                                |
|                                 | Desc Msg: store is disconnected:deregister the connection                             |
|                                 | Desc Msg: Receive from Archive failed                                                 |
|                                 | Desc Msg: Unreadable Data Server message type                                         |
|                                 | Desc Msg: Unreadable OM report                                                        |
|                                 | Desc Msg: Failed to send correlation error data to Archive                            |
|                                 | Desc Msg: OM Registration failed                                                      |
|                                 | Desc Msg: Unreadable registration response                                            |
|                                 | Desc Msg: OM DeRegistration failed                                                    |
|                                 | Desc Msg: Unreadable deregistration response from Data Server                         |
|                                 | Desc Msg: Failed to send CM info request to Data Server                               |
|                                 | Desc Msg: Failed to send deferred registration message to Data Server                 |
|                                 | Desc Msg: Failed to send re-registration message to Data Server                       |
|                                 | Desc Msg: Fatal status change                                                         |
|                                 | Desc Msg: Unreadable OM status received from Data Server                              |
|                                 | Desc Msg: Could not get GroupInfo                                                     |
|                                 | Desc Msg: Failed to send nlGrpInfoRsp data to Archive                                 |
|                                 | Desc Msg: Unreadable CM info message from Data Server                                 |
|                                 | Desc Msg: Could not open License File                                                 |
|                                 | Desc Msg: Unexpected message type from Data Server                                    |
|                                 | Desc Msg: Lost connection to Data Server                                              |
|                                 | Desc Msg: Receive from Data Server failed                                             |
|                                 | Desc Msg: Communications not initialized                                              |



**CS2000 Logs/Faults available**

| Log/Fault       | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                 | <p>Desc Msg: Failed to send end_of_report msg to store</p> <p>Desc Msg: Connection from unknown end point</p> <p>Desc Msg: Switch name unknown</p> <p>Desc Msg: Arithmetic overflow in correlation &lt;correlation name&gt;</p> <p>Desc Msg: Failed to send OM data to Archive</p> <p>Desc Msg: Error while doing a send to the Agent, discard send queue</p> <p>Desc Msg: Port for the service &lt;NLservice name&gt; is not available</p> <p>Desc Msg: Failed to register for connection to export Server at service &lt;service name&gt;</p> <p>Desc Msg: Failed to register for connection to Data Server at port &lt;port num&gt;</p> <p>Desc Msg: Failed to register for connection to Data Server at service &lt;service name&gt;</p>                                                                                                                                                                                                                                             |
| NWM logs        | <p>NWM102      Cancel To (CANT) control is applied to or removed from a specific trunk group. For details, see CS2000 configuration information and Solution-level configuration information.</p> <p>NWM103      Cancel From (CANF) control is applied to or removed from a specific trunk group. For details, see CS2000 configuration information and Solution-level configuration information.</p> <p>NWM104      SKIP control is applied to or removed from a specific trunk group. For details, see CS2000 configuration information and Solution-level configuration information.</p> <p>NWM107      Flexible ReRoute (FRR) control is applied to or removed from a specific trunk group. For details, see CS2000 configuration information and Solution-level configuration information.</p> <p>NWM202      HTR code has been added to or deleted from EADAS or MAP terminal. For details, see CS2000 configuration information and Solution-level configuration information.</p> |
| RMGC log        | When a major RMGC alarm is raised or cleared, an SNMP trap is sent from the GWC to the GWC EM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| RSIP status log | The RMGC application produces a syslog performance report once an hour which is sent to the Solaris syslog daemon. It contains the counts of the total number of RSIPs processed successfully and the number failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| SFPS log        | SFPS100      Generated when a craft person enters an invalid LFPS password three times.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**CS2000 Logs/Faults available**

| Log/Fault                                         | Description           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SIP Gate-<br>way Applica-<br>tion CallP<br>Alarms | Database Access Alarm | (Critical) occurs when the CallP application tries to access the database and it fails due to a loss of connectivity between the database and the CallP application. Correlates with the 310 log.                                                                                                                                                                                                                                                              |
|                                                   | ACL Trouble Alarm     | Raised when incoming SIP messages are dropped due to Access Control List enforcements. The severity of the alarm is based on the number of packets dropped in last 15-minute time interval. Correlates with the SIPC750 log.                                                                                                                                                                                                                                   |
| SIPC logs                                         | SIPC301               | A critical log that is generated when the SIP Gateway Call Processing Application will not receive any incoming SIP messages due to Access Control List being enabled and no valid entries in the Remote SIP server or ACL list.                                                                                                                                                                                                                               |
|                                                   | SIPC310               | “SIP CallP No Database Connection” is associated with the generation of the Critical alarm due to a loss of connectivity between the database and the CallP application. The same log number is used for “SIP CallP Database Connection Established” when the connection that caused the first SIPC 310 log is re-established and the alarm is cleared.                                                                                                        |
|                                                   | SIPC650               | An informational log that is generated when the CallP application goes to get data from the database for a particular table and no data is found.                                                                                                                                                                                                                                                                                                              |
|                                                   | SIPC750               | Generated when the SIP Gateway Call Processing Application drops incoming SIP messages due to Access Control List restrictions. A Minor, Major, or Critical log is generated based on the number of SIP messages dropped in the last 15 minutes.                                                                                                                                                                                                               |
| SIPGW log                                         | SIPGW700              | An INFO log that contains one of 34 possible log messages related to SIP call processing.                                                                                                                                                                                                                                                                                                                                                                      |
| SIPM logs                                         | SIPM300               | A Trouble log which is generated any time the SIP Gateway Application Maintenance software encounters an unexpected condition.                                                                                                                                                                                                                                                                                                                                 |
|                                                   | SIPM301               | A Trouble log which is generated any time the SIP Gateway Maintenance Trouble Alarm is raised or lowered.                                                                                                                                                                                                                                                                                                                                                      |
|                                                   | SIPM302               | A Trouble log which is generated any time the SIP Gateway Maintenance Sync Trouble Alarm is raised or lowered. This occurs when the SIP Gateway application state gets out of sync, or gets back in sync in a duplex Session Server configuration.                                                                                                                                                                                                             |
|                                                   | SIPM500               | An INFO log which is generated any time the SIP Gateway Application maintenance state changes.                                                                                                                                                                                                                                                                                                                                                                 |
| SIPS logs                                         | SIPS300               | Generated during the alarming of dropped connection requests (due to either the threshold being crossed for throttling connections, or due to attempting to use TLS when TLS is not enabled). The severity of the alarm indicates the threshold that was crossed, 10 dropped connection requests in a minute for a MINOR, 50 dropped requests for a MAJOR, and 100 dropped requests (or more) for a critical. The alarm is raised for a minimum of 30 minutes. |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SIPS301   | Generated during authentication failure events. The alarmd process log indicates the level of trouble (CRIT indicates a very serious problem, MINOR may be transient or the beginning of a series of authentication failures).                                                                                                                                                                                                                                                                                        |
| SIPS302   | Generated as a result of the alarm process check to ensure the Local Server certificate continues to be valid. The expiration date contained in the certificate is checked on a daily basis, and when the expiration of the certificate will occur within 31 days (MINOR), 15 days (MAJOR), or 5 days (CRIT), the alarm is raised, with this log. For certificates that have already expired, the CRIT alarm and log is generated, and authentication failures will be output for any connections that are attempted. |
| SIPS305   | Generated during the initialization of the Call Processing application (i.e. during the unlock). If one of these critical logs comes out, it means that there is a problem with the initialization, and the application is unable to start.                                                                                                                                                                                                                                                                           |
| SIPS600   | Generated during the connection set up of the Call Processing application. When the 'monitor OMs' log comes out, ensure that the threshold levels set for connection throttling are reasonable for the size of the office. If the 'TLS is not enabled' message comes out, ensure that the initialization of the call processing application worked correctly.                                                                                                                                                         |
| SIPS601   | Generated during authentication failure events. This INFO log indicates the reason for the authentication failures.                                                                                                                                                                                                                                                                                                                                                                                                   |
| SIPS604   | Generated during the initialization of the Call Processing application (i.e. during the unlock). This log indicates when the current local certificate will expire.                                                                                                                                                                                                                                                                                                                                                   |
| SIPS605   | Generated during the initialization of the Call Processing application (i.e. during the unlock). This log indicates that TLS has been enabled. Expect a SIPS604 log along with this log.                                                                                                                                                                                                                                                                                                                              |
| SIPS606   | Generated when there is a problem importing the trusted certificate provisioned via the web interface in the database.                                                                                                                                                                                                                                                                                                                                                                                                |
| SPFS logs | SPFS 310 is generated for the following reasons:                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|           | <ul style="list-style-type: none"> <li>when the CPU load Average threshold is exceeded, or when the related Major or Minor alarm is cleared.</li> <li>when the Swap Space usage threshold is exceeded, or when the related Critical or Major alarm is cleared.</li> <li>when the Memory usage threshold is exceeded, or when the related Major or Minor alarm is cleared.</li> </ul>                                                                                                                                  |
|           | SPFS 350 is generated when the File System is not mounted, the File System usage threshold is exceeded, a File System read/write failed, or when the related Critical, Major or Minor alarm is cleared.                                                                                                                                                                                                                                                                                                               |
|           | SPFS350 A Trouble log which is generated any time the SIP Gateway Maintenance Trouble Alarm is raised or lowered.                                                                                                                                                                                                                                                                                                                                                                                                     |

**CS2000 Logs/Faults available**

| Log/Fault  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STOR logs  | <p>STOR605 (Critical) Output when the Store Audit has detected a corruption in the Bstree structures containing the information about the data address space STOR is responsible for.</p> <p>STOR606 Indicates that the Store Audit has found a corruption in the allocation information for data store which is dumped (such as DSPROT) and it is very likely that a attempt to perform a dump while in this state would fail.</p> <p>STOR607 Generated when the Store Audit detects a mismatch between the Store Allocator's internal setting of an address' blocking attribute and the actual setting of the attribute in memory hardware.</p> |
| TLS alarms | <p>TLS connection request comes in above the connection throttle limit (and above the threshold for the alarm - the defined thresholds are: 10 for minor, 50 for major, and 100 for critical).</p> <p>TLS connection handshake failures (the thresholds are: 1 for minor, 2 for major, and 5 for critical).</p> <p>TLS local certificate expiration (expiry in 31 days or less - minor, 15 days or less - major, and 5 days or less - critical).</p>                                                                                                                                                                                              |
| TMN logs   | <p>TMN301 Application error</p> <p>TMN302 System error</p> <p>TMN303 Communication error</p> <p>TMN309 Data Server error</p> <p>TMN311 Fatal error</p> <p>TMN600 Information only</p> <p>TMN601 File IO info</p> <p>TMN604 Application status</p> <p>TMN630 DataServer OK</p>                                                                                                                                                                                                                                                                                                                                                                     |
| TOPS logs  | <p>TOPS131 Generated when problems occur in the call flow for the activity TOPS Wireless Automated Directory Assistance Call (ADACC) with Release.</p> <p>TOPS615 An INFO log to indicate the operator teams and the number of positions in each team with auto-compression turned on.</p> <p>AUD690 Generated when a TOPS calls ends unexpectedly with an IS41TOPS extension block attached.</p>                                                                                                                                                                                                                                                 |
| TRK logs   | <p>TRK101 Percentage of busy trunks in a trunk group exceeded the threshold value for a minor alarm.</p> <p>TRK102 Major alarm threshold reached or exceeded.</p> <p>TRK103 Number of trunks in a trunk group exceeded threshold value for a critical alarm.</p> <p>TRK104 Percentage of busy trunks dropped below a threshold value.</p>                                                                                                                                                                                                                                                                                                         |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                          |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TRK110    | Trunk state change to SysB (system busy) LO (Lockout) from CPB (call processing busy).                                                                               |
| TRK112    | Request to take trunk off the lockout (LO) list and RTS (return to service) initiated by a manual request from the LTP MAP display level or by a system request.     |
| TRK122    | Both planes of the trunk equipment have lost accuracy detected by central control (CC).                                                                              |
| TRK123    | Peripheral processor (PP) has sent a wrong message to central control.                                                                                               |
| TRK138    | Call routed for treatment after system was call processing busy (CPB).                                                                                               |
| TRK151    | Blue Box Fraud (BBF) detection activated.                                                                                                                            |
| TRK152    | Blue Box Fraud (BBF) detection deactivated.                                                                                                                          |
| TRK153    | Blue Box Fraud (BBF) call detected.                                                                                                                                  |
| TRK154    | Blue Box Fraud (BBF) call disconnected to identify calling and called parties.                                                                                       |
| TRK155    | Emergency Service Bureau (ESB) originating the call is off-hook longer than the time designated in customer table TRKGRP.                                            |
| TRK164    | External call routed through local office to a distant office that has requested calling line identification (CLI).                                                  |
| TRK251    | UCS: trouble with an invalid authcode.                                                                                                                               |
| TRK255    | UCS: trouble with database.                                                                                                                                          |
| TRK257    | UCS: trouble translating a partition number to STS due to an invalid partition.                                                                                      |
| TRK258    | UCS: trouble translating STS to partition number, due to an invalid STS.                                                                                             |
| TRK355    | Trunk idle queue sanity trouble or rebuild.                                                                                                                          |
| TRK420    | UCS: invalid authcode.                                                                                                                                               |
| TRK424    | First call processing threshold error; failed diagnostic test; and call processing error threshold appears again within 15 minutes of the diagnostic test.           |
| TRKT logs | These logs are only generated if OFCVAR office parameter GENERATE_TRKT_LOGS is activated. Otherwise, TRK138 logs are generated with an appropriate treatment reason. |
| TRKT200   | ANI Database Failure.                                                                                                                                                |
| TRKT201   | ANI Account Status Not Allowed.                                                                                                                                      |
| TRKT202   | ANI Acct Recently Disallowed.                                                                                                                                        |
| TRKT203   | Calling Card Invalid                                                                                                                                                 |
| TRKT204   | Calling Card Time-out                                                                                                                                                |

**CS2000 Logs/Faults available**

| Log/Fault  | Description                                                                                                                                       |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
|            | TRKT205 General No Circuit                                                                                                                        |
|            | TRKT206 Reorder                                                                                                                                   |
|            | TRKT207 Restricted Date Time                                                                                                                      |
|            | TRKT208 Storage Overflow Reorder                                                                                                                  |
|            | TRKT209 Start Signal Time-out                                                                                                                     |
|            | TRKT210 Start Signal Time-out                                                                                                                     |
|            | TRKT211 Vacant Code                                                                                                                               |
|            | TRKT212 Vacant Country Code                                                                                                                       |
|            | TRKT213 Trigger Block                                                                                                                             |
| USNBD logs | UNB300 Reports problems with USNBD shared resources used by PCES.                                                                                 |
|            | UNB302 Reports problems with USNBD processes used by PCES                                                                                         |
|            | UNB304 Reports success and failure of surveillance activation and deactivation, and problems with surveillance activation.                        |
|            | UNB305 Reports problems that affect PCES administration data and reports all user creations and deletions.                                        |
| XAC logs   | XAC300 Low Shared Memory (SM) condition. Accompanied by LowSM alarm.                                                                              |
|            | XAC302 Low Processor Element (PE) condition. Accompanied by LowPE alarm.                                                                          |
|            | XAC303 MScomm (Message Switch Communication) problem. Accompanied by MScomm alarm.                                                                |
|            | XAC304 TOD (Time of Day clock) problem. Accompanied by TOD alarm.                                                                                 |
|            | XAC305 RTIF (Reset Terminal Interface) problem. Accompanied by RTIF alarm.                                                                        |
|            | XAC306 Disk problem. Accompanied by DISK alarm.                                                                                                   |
|            | XAC307 Tape problem. Accompanied by TAPE alarm.                                                                                                   |
|            | XAC308 Image Test failure. Accompanied by Image alarm.                                                                                            |
|            | XAC309 Loss of communication between the AMDI packet and any MG4000.                                                                              |
|            | XAC310 Card manual busy.                                                                                                                          |
|            | XAC312 IOP fault. Accompanied by IOPflt alarm. Modified in SN08 to display the new CMIC and RTIF port device and CMIC and RTIF packets and links. |
|            | XAC312 IOP fault. Accompanied by IOPflt alarm.                                                                                                    |
|            | XAC320 Cardlist Report.                                                                                                                           |
|            | XAC321 WgSlot (Shelf Audit Failure - Card Configuration). Accompanied by WgSlot alarm.                                                            |
|            | XAC322 PETrbl. Accompanied by PETrbl alarm.                                                                                                       |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                         |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XAC323    | SMTrbl. Accompanied by SMTrbl alarm.                                                                                                                                |
| XAC324    | IOTrbl. Accompanied by IOTrbl alarm.                                                                                                                                |
| XAC325    | RIBKEY detected. Accompanied by RIBKey alarm.                                                                                                                       |
| XAC326    | MS Link configuration mismatch.                                                                                                                                     |
| XAC327    | WgSlot (Card inserted into wrong slot). Accompanied by WgSlot alarm.                                                                                                |
| XAC329    | Loss of communication with XA-Core or loss of Ethernet link redundancy. Associated with the following OM groups: XETHRMJU, XETHRCRU, XETHR, XETHRPRT, and XETHRLNK. |
| XAC330    | FW version mismatch. Accompanied by FWvers alarm.                                                                                                                   |
| XAC333    | FW loading failure.                                                                                                                                                 |
| XAC335    | Unknown CO-3 packet fault. Accompanied by AMDI alarm.                                                                                                               |
| XAC337    | Raised when the Baseln alarm is first raised, or the Baseln alarm is still raised and the non-baseline component list changes.                                      |
| XAC400    | XA-Core summary report.                                                                                                                                             |
| XAC413    | REx schedule failure. Accompanied by RExSch alarm.                                                                                                                  |
| XAC415    | Routine exercise report. SN08 adds "not at baseline" as a reason for not running the SREx test.                                                                     |
| XAC600    | LowSM condition cleared.                                                                                                                                            |
| XAC601    | MemLim condition cleared.                                                                                                                                           |
| XAC602    | LowPE condition cleared.                                                                                                                                            |
| XAC603    | MScomm alarm cleared.                                                                                                                                               |
| XAC604    | TOD alarm cleared.                                                                                                                                                  |
| XAC605    | RTIF alarm cleared.                                                                                                                                                 |
| XAC606    | DISK alarm cleared.                                                                                                                                                 |
| XAC607    | Tape alarm cleared.                                                                                                                                                 |
| XAC608    | Image alarm cleared.                                                                                                                                                |
| XAC609    | AMDI link condition cleared.                                                                                                                                        |
| XAC610    | Card returned to service. Modified in SN08 to display the new CMIC and RTIF port device and CMIC and RTIF packets and links.                                        |
| XAC612    | IOP alarm cleared.                                                                                                                                                  |
| XAC613    | REx schedule report.                                                                                                                                                |
| XAC614    | XATrap alarm cleared.                                                                                                                                               |
| XAC615    | REx started.                                                                                                                                                        |

**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XAC618    | Split (Split mode entered).                                                                                                                                                                                                                                                                                                                              |
| XAC619    | Split mode exited.                                                                                                                                                                                                                                                                                                                                       |
| XAC622    | PETrbl alarm cleared.                                                                                                                                                                                                                                                                                                                                    |
| XAC623    | SMTTrbl alarm cleared.                                                                                                                                                                                                                                                                                                                                   |
| XAC624    | IOTrbl alarm cleared.                                                                                                                                                                                                                                                                                                                                    |
| XAC625    | RIBKEY removed.                                                                                                                                                                                                                                                                                                                                          |
| XAC626    | MS Link configuration restored.                                                                                                                                                                                                                                                                                                                          |
| XAC627    | WgSlot cleared (card removed).                                                                                                                                                                                                                                                                                                                           |
| XAC628    | Output when provisioning or deprovisioning.                                                                                                                                                                                                                                                                                                              |
| XAC629    | Loss of communication restored.                                                                                                                                                                                                                                                                                                                          |
| XAC630    | FWvers cleared.                                                                                                                                                                                                                                                                                                                                          |
| XAC631    | FW soaking started. Accompanied by FWsoak alarm.                                                                                                                                                                                                                                                                                                         |
| XAC632    | FW soaking completed.                                                                                                                                                                                                                                                                                                                                    |
| XAC633    | FW loading started.                                                                                                                                                                                                                                                                                                                                      |
| XAC634    | FW loading completed.                                                                                                                                                                                                                                                                                                                                    |
| XAC635    | FW soaking in progress.                                                                                                                                                                                                                                                                                                                                  |
| XAC637    | Raised when the Baseln alarm is cleared, due to an empty list of non-baseline components.                                                                                                                                                                                                                                                                |
| XAC640    | Manual Test Report.                                                                                                                                                                                                                                                                                                                                      |
| XAC641    | Alarm enable/disable notification.                                                                                                                                                                                                                                                                                                                       |
| XAC801    | MemLim (Memory Limit). Accompanied by MemLim alarm.                                                                                                                                                                                                                                                                                                      |
| XAC814    | XATrap. Accompanied by XATrap alarm.                                                                                                                                                                                                                                                                                                                     |
| XACP logs | XACP300 Generated every minute that the EXT alarm HIGH_MEM_BLOCKING is active.                                                                                                                                                                                                                                                                           |
|           | XACP500 Generated once when the memory blocking level has returned to normal.                                                                                                                                                                                                                                                                            |
|           | XACP600 Summarizes the minute-by-minute memory blocking level; generated once every 15 minutes. If all 15 minutes had normal blocking levels, the log has only one line of output stating that all 15 minutes had normal blocking levels. If at least one minute out of 15 reported high blocking levels, the log output reports each minute separately. |



**CS2000 Logs/Faults available**

| Log/Fault | Description                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XAUD logs | XAUD395, 397, 400, 401, 430, 432, 432, 434, 500, 501, 708, 709, 714, 715, 723, 724, 725, 979, 980, 981, 982, 977, 978 | These call processing resource dump logs are generated whenever a call processing resource is recovered by the audit process running on the XA-Core. The only difference in the logs is the amount of data dumped. In SN08, the location and number of bits used to represent the extension block's format code in the header (within the hex dump of the log) has changed for all extension block logs. The only noticeable difference to the customer will be the number following the XAUD string in the log title. |
| XNET logs | XNET600                                                                                                               | Connection between nodes has been replaced.                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|           | XNET601                                                                                                               | New connection between nodes failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|           | XNET602                                                                                                               | Connection between nodes does not exist, and attempts to connect them failed.                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|           | XNET605                                                                                                               | The bearer networks of the two parties in a connection attempt are not permitted to inter-connect, based on datafill in table NET2NET.                                                                                                                                                                                                                                                                                                                                                                                 |
|           | XNET606                                                                                                               | Indicates a software or provisioning problem in the switch, in that an appropriate bearer network could not be determined through provisioned data for a particular party in a connection attempt.                                                                                                                                                                                                                                                                                                                     |
|           | XNET607                                                                                                               | Indicates that an IW SPM interworking bridge was not available for the connection request, either because of a bridge exhaust condition, or a bridge is not available.                                                                                                                                                                                                                                                                                                                                                 |
| XPKT log  | XPKT340                                                                                                               | Reports a variety of Gateway, Gateway Controller, and DPTMA resource problems, including failed anchor attempts.                                                                                                                                                                                                                                                                                                                                                                                                       |

**GWC--available logs/faults**

The following table lists the GWC Logs/Faults available.

GWC supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled "IEMS Functionality." For details on the logs/faults themselves, refer to the Fault Management section of GWC FCAPS

documentation, NN10090-911 and NN10275-909, *Fault Management Log Reference*.

#### GWC Logs/Faults available

| Log/Fault                                                                                                                                                                                                                                 | Description                                                                                                                                                                                                                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: GWC (PGC load)</b>                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                |
| The PM180, 181, 185, and 177 faults are first sent to the core and are then sent northbound from the CS2000 Core Manager in SCC2 format. The remaining faults are sent from the GWC to the GWC EM and are then sent northbound via CORBA. |                                                                                                                                                                                                                                                                                                |
| PM180                                                                                                                                                                                                                                     | Indicates a software error (SWERR) has occurred.                                                                                                                                                                                                                                               |
| PM181                                                                                                                                                                                                                                     | Generates for a variety of GWC-to-core-related communications issues. Modified in SN08 to indicate that the ABI of an ABI-hosted XPM is attempting to or successfully exit(s) ESA.                                                                                                             |
| PM185                                                                                                                                                                                                                                     | Indicates that the GWC has trapped.                                                                                                                                                                                                                                                            |
| PM777                                                                                                                                                                                                                                     | Indicates a hardware fault. Reason text identifies the suspected hardware.                                                                                                                                                                                                                     |
| The remaining faults are sent from the GWC to the GWC EM and are then sent northbound via CORBA. The following alarms are generated by the GWC, except for the first one generated by the alarm browser.                                  |                                                                                                                                                                                                                                                                                                |
| SNMP Timeout                                                                                                                                                                                                                              | Critical; indicates a communications subsystem failure.                                                                                                                                                                                                                                        |
| Test                                                                                                                                                                                                                                      | Minor; a test alarm generated from the pmdebug interface.                                                                                                                                                                                                                                      |
| Active unit disabled                                                                                                                                                                                                                      | Critical; indicates a unit is out of service and not available.                                                                                                                                                                                                                                |
| Standby unit disabled                                                                                                                                                                                                                     | Critical; indicates a unit is out of service and not available.                                                                                                                                                                                                                                |
| Core communication lost                                                                                                                                                                                                                   | Major if active unit; Minor if inactive unit. No response received to Core heartbeat.                                                                                                                                                                                                          |
| Mate unit communication lost                                                                                                                                                                                                              | Minor; no response received to mate heartbeat.                                                                                                                                                                                                                                                 |
| Gateway communication lost                                                                                                                                                                                                                | A gateway has stopped responding to heartbeat.                                                                                                                                                                                                                                                 |
| EM communication lost                                                                                                                                                                                                                     | Major. No response received for Persistent Data Verification SNMP Trap; EM not responding. Problem may be "EM not present, provisioned data loaded from local flash," OR "EM audit indicates provisioned inservice data is old, need manual intervention to recover." Cleared with a busy RTS. |
| FLASH error                                                                                                                                                                                                                               | Minor. Error in writing Flash; erase of Flash sector failed. Cleared with hardware replacement.                                                                                                                                                                                                |
| FLASH life span exceeded                                                                                                                                                                                                                  | Minor. The number of writes to FLASH has exceeded the recommended/intended limit.                                                                                                                                                                                                              |

**GWC Logs/Faults available**

| Log/Fault             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Security_SA_capacity  | Minor or Major. Security Association alarms are nearing capacity. Cleared by the security alarms application which monitors the resource level and cleared the alarm when the alarm condition as been cleared on the GWC. Currently alarms are only managed on the active GWC unit (i.e., data is not mirrored to the inactive unit), and for this reason during a SWACT alarms are automatically cleared on the unit dropping activity.            |
| Security_SA_fail      | Major. The number of Security Association alarms has exceeded the threshold. Cleared by the security alarms application which monitors the resource level and cleared the alarm when the alarm condition as been cleared on the GWC. Currently alarms are only managed on the active GWC unit (i.e., data is not mirrored to the inactive unit), and for this reason during a SWACT alarms are automatically cleared on the unit dropping activity. |
| Recovery alarm        | A GWC recovery process has terminated early, and the GWC remains out of service.                                                                                                                                                                                                                                                                                                                                                                    |
| DQOSMTC_DQoSLinkLoss  | A DQoS/COPS connection failure has occurred. Cleared by DCCNXMGR (via DCALARM) when the connection is reestablished or the connection is deleted via provisioning.                                                                                                                                                                                                                                                                                  |
| Datasync alarm        | The GWC does not contain the latest provisioned data. This alarm may be raised by the GWC EM noting the problem and sending a message to the GWC to raise the alarm.                                                                                                                                                                                                                                                                                |
| Unit Out of Service   | Critical if active unit; minor if inactive unit. The GWC Profile failed to validate, probably because no profile is available to activate. Cleared with a GWC reload.                                                                                                                                                                                                                                                                               |
| QOS error log         | If the QCA detects an event or an error, a syslog message is generated and a non-QoS record is written to the output stream (file).                                                                                                                                                                                                                                                                                                                 |
| QOS connection alarm  | An alarm is generated whenever a message cannot be sent to the server. The alarm is cleared as soon as the QoS report application is able to send QoS reports to the server.                                                                                                                                                                                                                                                                        |
| <b>GWC Alarm Logs</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| GWC300                | Active unit disabled. Critical; indicates a unit is out of service and not available.                                                                                                                                                                                                                                                                                                                                                               |
| GWC301                | Standby unit disabled. Indicates a unit is out of service and not available. Minor if the unit is ManB, but Major if the unit is SysB.                                                                                                                                                                                                                                                                                                              |
| GWC302                | Core communication lost. Major if active unit; Minor if inactive unit. No response received to Core heartbeat.                                                                                                                                                                                                                                                                                                                                      |
| GWC303                | Mate unit communication lost. Minor; no response received to mate heartbeat.                                                                                                                                                                                                                                                                                                                                                                        |
| GWC304                | Gateway communication lost. A gateway has stopped responding to heartbeat. This log is triggered only for gateways that have 64 or more endpoints.                                                                                                                                                                                                                                                                                                  |
| GWC305                | This is a test alarm generated from pmdebug interface. Severity level changed in SN06; can have a severity level of critical, major, minor or warning.                                                                                                                                                                                                                                                                                              |
| GWC306                | DQOSMTC_DQoSLinkLoss. A DQoS/COPS connection failure has occurred. Cleared by DCCNXMGR (via DCALARM) when the connection is reestablished or the connection is deleted via provisioning                                                                                                                                                                                                                                                             |

**GWC Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GWC307    | EM communication lost. Major. No response received for Persistent Data Verification SNMP Trap; EM not responding. Problem may be "EM not present, provisioned data loaded from local flash," OR "EM audit indicates provisioned inservice data is old, need manual intervention to recover." Cleared with a busy RTS.<br><br>Datsync alarm The GWC does not contain the latest provisioned data. This alarm may be raised by the GWC EM noting the problem and sending a message to the GWC to raise the alarm. |
| GWC308    | FLASH error Minor. Error in writing Flash; erase of Flash sector failed. Cleared with hardware replacement.                                                                                                                                                                                                                                                                                                                                                                                                     |
| GWC309    | Security_SA_capacity. Minor or Major. Security.Association alarms are nearing capacity. Cleared by the security alarms application which monitors the resource level and clears the alarm when the alarm condition has been cleared on the GWC. Currently alarms are only managed on the active GWC unit (i.e., data is not mirrored to the inactive unit), and for this reason during a SWACT alarms are automatically cleared on the unit dropping activity.                                                  |
| GWC310    | Security_SA_fail. Major. The number of Security Association alarms has exceeded the threshold. Cleared by the security alarms application which monitors the resource level and cleared the alarm when the alarm condition as been cleared on the GWC. Currently alarms are only managed on the active GWC unit (i.e., data is not mirrored to the inactive unit), and for this reason during a SWACT alarms are automatically cleared on the unit dropping activity.                                           |
| GWC311    | Provisioned GWC Profile not yet activated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| GWC312    | QOS connection alarm. An alarm is generated whenever a message cannot be sent to the server. The alarm is cleared as soon as the QoS report application is able to send QoS reports to the server.                                                                                                                                                                                                                                                                                                              |
| GWC313    | Major. RMGC can't process all coming requests. RMGC can't process all coming requests. It is in the processing error category. The probable cause is the resource at or nearing capacity.                                                                                                                                                                                                                                                                                                                       |
| GWC314    | Raised in connection with a Location Id Reporting connection failure alarm.                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| GWC398    | SNMP Timeout Critical; indicates a communications sub0system failure.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| GWC399    | Is the clear log for all GWC alarms and for CMT alarms. This log is triggered only for gateways that have 64 or more endpoints.                                                                                                                                                                                                                                                                                                                                                                                 |
| GWC501    | Unable to maintain connection to remote gateway of 64 or fewer endpoints.                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| GWC502    | Connection to remote gateway restored.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| GWC503    | Connection drop initiated by remote gateway.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| GWC506    | Generated for any of 3 events: Time to Live Expired, Gateway Unregistration by CS2K Successful, or Gateway Initiated Unregistration Successful.                                                                                                                                                                                                                                                                                                                                                                 |
| GWC507    | Generated to indicate Gateway Registration Successful.                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

**GWC Logs/Faults available**

| Log/Fault         | Description                                                                                                                                                                          |
|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GWC alarms        | External Host Interface Signal Loss, based on the number of gateways that are out of service as compared to the number of gateways provisioned checked on a 5 minute polling period. |
|                   | External Host Interface Configuration Error, based on a 5 minute polling period.                                                                                                     |
|                   | External Host Interface Protocol Error, based on the number of USP connections that are not active but do have heartbeat messages checked on a 5 minute polling period.              |
| GWC security logs | telnet connection from remote host                                                                                                                                                   |
|                   | serial connection                                                                                                                                                                    |
|                   | login attempted                                                                                                                                                                      |
|                   | login result                                                                                                                                                                         |
|                   | authentication server unreachable                                                                                                                                                    |
|                   | logout (by request, force out, or idle timeout)                                                                                                                                      |
|                   | local account login                                                                                                                                                                  |
|                   | local password change/reset                                                                                                                                                          |
|                   | GWC restart                                                                                                                                                                          |
|                   | GWC reload                                                                                                                                                                           |

**SPM--available logs/faults**

The following table lists the SPM family Logs/Faults available.

The SPM family supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled “IEMS Functionality.” For details on the logs/faults themselves, refer to the Fault Management section of the appropriate SPM FCAPS documentation and NN10275-909, *Fault Management Log Reference*.

- SPM: NN10075-911
- DPT-SPM: NN10079-911 (IP)
- IW-SPM: NN10077-911 (IP)

**General SPM Logs/Faults available**

| Log/Fault                                  | Description                                                                                       |
|--------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Network Element: SPM (all variants)</b> |                                                                                                   |
| ATM300                                     | Generated when a Loss of Cell Delineation (LCD) alarm condition is raised on an SPM with ATM RMs. |
| ATM500                                     | The system's ATM ILMI status has changed.                                                         |

**General SPM Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                              |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ATM501    | The system's ATM signaling status has changed.                                                                                                                                                                                                           |
| ATM600    | The ATM framework has gained a registered ATM address.                                                                                                                                                                                                   |
| ATM601    | The ATM framework has been de-registered by the ATM network.                                                                                                                                                                                             |
| ATM604    | System software cannot recover the ATM Framework (ATM RM will be busied and RTS'ed)                                                                                                                                                                      |
| ATM605    | ATM overload event.                                                                                                                                                                                                                                      |
| ATM606    | ATM service failure.                                                                                                                                                                                                                                     |
| ATM800    | A trouble log that indicates possible degradation of service related to ATM Performance Monitoring thresholds.                                                                                                                                           |
| ATMBCN    | This alarm is raised when the ATM framework cannot support bearer connections. The alarm causes the SPM to show at the PM portion of the alarm banner as "SPM *C*." This alarm complements the ATMFWD alarm currently displayed beneath the APPL banner. |
| BITS300   | A clock sync critical alarm has been raised for one of these: MTIE Performance, Alarm Indication Signal, Loss of Signal, or Out of Frame. Correlates with BITS600.                                                                                       |
| BITS301   | A clock sync non-critical alarm has been raised for one of these: Timing Link Degradation, Bipolar Violation, or Cyclic Redundancy Check. Correlates with BITS601.                                                                                       |
| BITS500   | BITS link state change capturing old/new states and reason for change (including degradation of carrier (LOS, LOF)).                                                                                                                                     |
| BITS600   | BITS Fault Report Cleared; critical alarm from BITS300 is cleared.                                                                                                                                                                                       |
| BITS601   | BITS Fault Report cleared; non-critical alarm from BITS301 is cleared.                                                                                                                                                                                   |
| BITS610   | Reference Quality Change to a new SSM state.                                                                                                                                                                                                             |
| BITS612   | BITS Reference Switch; indicates the reason for the reference switch.                                                                                                                                                                                    |
| C7UP109   | A CQ state change has occurred.                                                                                                                                                                                                                          |
| C7UP113   | Indicates ISUP maintenance trouble.                                                                                                                                                                                                                      |
| C7UP114   | Generated for an ISUP alert.                                                                                                                                                                                                                             |
| C7UP120   | An invalid range field exists.                                                                                                                                                                                                                           |
| C7UP130   | The HOP counter has expired.                                                                                                                                                                                                                             |
| C7UP301   | The HC value is not sufficient.                                                                                                                                                                                                                          |
| CARR300   | A carrier failure event cleared. Correlates to alarms AIS, APSAM, APSCHMM, APSIC, APSMM, BERSD, BERSF, LOF, LOP, LOS, PLM, RAI, RFI, SIMPLEX, TIM. Correlates with CARR310.                                                                              |
| CARR310   | A carrier failure event has occurred. Correlates to alarms AIS, APSFC, APSFEPLF, APSLCK, APSMAN, BERSD, BERSF, LOF, LOP, LOS, PLM, RAI, RFI, SIMPLEX, TIM.                                                                                               |
| CARR315   | A trouble log that includes the actual fault description text sent by the MG9K.                                                                                                                                                                          |
| CARR330   | A protection switch has occurred. A previously inactive carrier in the protection group takes over as the active carrier.                                                                                                                                |

**General SPM Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                   |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CARR331   | A protection switch was attempted but failed.                                                                                                                                                                 |
| CARR340   | The inactive carriers in a protection group have changed state in such a way that they cannot carry traffic. The protection group is now running in simplex mode.                                             |
| CARR341   | Both carriers have become available and normal protection switching can occur.                                                                                                                                |
| CARR500   | A carrier changes to an in service (InSv) state from manual busy (ManB) or system busy (SysB). Correlates to a MANB and SYSB alarm. Correlates with CARR511.                                                  |
| CARR501   | A carrier changes to central-side busy (CBsy) from ManB or SysB. Correlates to a MANB and SYSB alarm.                                                                                                         |
| CARR510   | A carrier changes to ManB from InSv, SysB, or CBsy. Correlates to a MANB and SYSB alarm.                                                                                                                      |
| CARR511   | Carrier state change to SysB from InSv or CBsy. Correlates to a SYSB alarm.                                                                                                                                   |
| CARR512   | OC3 carrier state change to CBsy from InSv, ManB, or SysB. Correlates to a MANB and SYSB alarm.                                                                                                               |
| CARR800   | Threshold crossing alert (TCA) for a metered performance parameter has been cleared.                                                                                                                          |
| CARR801   | Indicates that maintenance limits have been re-set.                                                                                                                                                           |
| CARR810   | TCA event for metered performance parameter has occurred. Correlates with CARR800.                                                                                                                            |
| CARR811   | TCA event for non-metered performance parameter has occurred. Also applies to STS-1 carrier on MG4000.                                                                                                        |
| DPTM500   | The state of DPT Terminals changed to IDL state from any other state.                                                                                                                                         |
| DPTM501   | The state of DPT Terminals changed to SYSB state from any other state.                                                                                                                                        |
| DPTM502   | The state of DPT Terminals changed to MANB state from any other state.                                                                                                                                        |
| DPTM503   | The state of DPT Terminals changed to PMB state from any other state.                                                                                                                                         |
| DPTM504   | The state of DPT Terminals changed to INB state from any other state.                                                                                                                                         |
| DPTM700   | Bulk downloading or dynamic update of DPT data failed, so there is a data mismatch in the CM and node. Correlates with DPTM701.                                                                               |
| DPTM701   | The DDM audit process cleared a DPT data mismatch between the core and the node.                                                                                                                              |
| DPTM702   | Indicates a call is rejected because the DPT SOC limit is reached.                                                                                                                                            |
| DPTM800   | Office-wide DPT terminal usage exceeds the level 1 threshold of 70%. Logs DPT800-803 are associated with OM group DPTOFC, registers DPUSAG and DPUSAG2; and OM group DPTNODE, registers DPTUSAG and DPTUSAG2. |
| DPTM801   | Office-wide DPT terminal usage drops below the level 1 threshold of 70%.                                                                                                                                      |
| DPTM802   | Office-wide DPT terminal usage exceeds the level 2 threshold of 90%.                                                                                                                                          |
| DPTM803   | Office-wide DPT terminal usage drops below the level 2 threshold of 85%.                                                                                                                                      |
| EAD115    | Problems with performance data collection associated with an OSS.                                                                                                                                             |
| EAD116    | Problems with the collection of MG 4000 performance data.                                                                                                                                                     |



**General SPM Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                            |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENET308   | ISTb state occurs or is cleared on a PSLINK. Correlates to an ISTB alarm. Associated with OM group ENLKERR.                                                                            |
| ENET311   | The SPM ATM node is SYSB, and a network error has caused it to be isolated from the ENET links or the MS ports. Correlates to a SYSBNA alarm.                                          |
| IOAU112   | Information log related to changes in System REX controller operation or schedule.                                                                                                     |
| IWBM500   | One of the following is out of service: C-side link, STS3cP carrier, ATM network state, or the ATM address state for the IW bridge software.                                           |
| IWBM501   | The out-of-service item in IWBM500 has returned to service.                                                                                                                            |
| IWBM502   | Indicates that a BSY command is being requested for a set of IW SPM bridge terminals.                                                                                                  |
| IWBM503   | Indicates that an RTS command is being requested for a set of IW SPM bridge terminals.                                                                                                 |
| IWBM504   | Indicates that an OFFL command is being requested for a set of IW SPM bridge terminals.                                                                                                |
| IWBM505   | Indicates that a FRLS command is being requested for a set of IW SPM bridge terminals.                                                                                                 |
| IWBM600   | The IW bridge receives an invalid terminal ID during an attempt to free a bridge causing a connectivity mismatch. An INFO log.                                                         |
| IWBM601   | Automatic system audit finds a problem and performs a corresponding action. An INFO log.                                                                                               |
| IWBM602   | No IDL bridges are available. An INFO log.                                                                                                                                             |
| IWBM603   | An IWBM audit is being performed. An INFO log.                                                                                                                                         |
| IWBM700   | A maintenance action is being performed. An INFO log.                                                                                                                                  |
| IWBM800   | Number of available IW bridges exceeds the first threshold (70%) when attempting to retrieve an IW-bridge ID from the IW bridge manager.                                               |
| IWBM801   | Number of available IW bridges falls to less than 65% of bridges in the pool in use. This log always occurs after IWBM 800.                                                            |
| IWBM802   | Number of available IW bridges exceeds the second threshold (90%) when attempting to retrieve an IW-bridge ID from the IW bridge manager.                                              |
| IWBM803   | Number of available IW bridges falls to less than 85% of bridges in the pool in use. This log always occurs after IWBM 802.                                                            |
| Link300   | A transport resource fault indicating a mis-connected DS512 link.                                                                                                                      |
| NODE300   | The integrated node maintenance (INM) generates this log when a trouble condition is present with the node. The log indicates INM recovery actions when the node state is system busy. |
| NODE302   | Reports a software alarm.                                                                                                                                                              |
| NODE303   | Generated to report the Wrong Application Data on the SPM.                                                                                                                             |
| NODE326   | Generated to report a hardware fault on the SPM.                                                                                                                                       |
| NODE500   | System node state change. Correlates to a SYSB alarm.                                                                                                                                  |
| NODE600   | An INFO log to notify of a system recovery action.                                                                                                                                     |



**General SPM Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                 |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NODE601   | An INFO log that provides system status notification.                                                                                                                                                                                                                                                                                                                       |
| NODE602   | Indicates the reason for CEM state transition, generated only when the CEM state transitions from Insv to Istb or Insv to Sysb.                                                                                                                                                                                                                                             |
| PM231     | Indicates that a PM failed to acknowledge an audit request to add or delete a channel connection.                                                                                                                                                                                                                                                                           |
| PM232     | Indicates that a PM operation from an audit request to add or delete a channel connection has succeeded.                                                                                                                                                                                                                                                                    |
| PM233     | Indicates that a PM operation from an audit request to add or delete a channel connection has failed. The request is from Special Connection Table Control Facility (SPECCONN) to add or delete a channel connection. The subsystem generates the modified log when the operation to update to the correct status fails for two consecutive audit cycles.                   |
| PM234     | Indicates that a PM failed to acknowledge an audit request to add or delete a channel connection.                                                                                                                                                                                                                                                                           |
| PM236     | Generated when the system finds integrity, does not find integrity, or loses integrity. Displayed when one of the following scenarios occurs: the system makes a special connection; integrity was lost or not found; or the SPECCONN audit acted on a special connection that has the status of NO_IINTEG.                                                                 |
| PRSM400   | A DPT SPM ATM loadfile containing DPT SPM ATM PRSU fixes has been datafilled in table PMLOADS.                                                                                                                                                                                                                                                                              |
| SOC802    | A warning log that the current configuration of the number of DPT ports is not authorized by Nortel, due to a conflict between the SOC limit and the setting of office parameter DPT_MAX_PORTS.                                                                                                                                                                             |
| SPM300    | A device fault has occurred. Correlates to a MANB, PROTFAIL, SYSB, and NOSPARE alarm.                                                                                                                                                                                                                                                                                       |
| SPM300    | A device fault has occurred. Correlates to a MANB, PROTFAIL, SYSB, and NOSPARE alarm. SN08 adds a new text reason showing that it is generated when a STS3L carrier experiences an RFI alarm. SN08 adds the aestivate/status of the unit/device. SN08 adds next text "Device Fault Report" due to being triggered via resource exhaustion/overload conditions on the ATMRM. |
| SPM301    | SPARTS patching log. An SPM patch is missing after an RTS occurred. Correlates to the PATCHFAIL, VCXO70, and VCXO90 alarms.                                                                                                                                                                                                                                                 |
| SPM310    | The CM has received performance data from the DPT SPM ATM as a result of the DPT SPM ATM-based automatic monitoring process.                                                                                                                                                                                                                                                |
| SPM311    | A software exception report (SWER) has occurred, OR one of the BITS links is out-of-service. Correlates to an LOR alarm.                                                                                                                                                                                                                                                    |
| SPM312    | A TBL trap has occurred on the CEM.                                                                                                                                                                                                                                                                                                                                         |
| SPM313    | A fault has been recorded in the Module Information Memory (MIM) of the SPM.                                                                                                                                                                                                                                                                                                |
| SPM314    | A generic IMC fault report to indicate a change in IMC status.                                                                                                                                                                                                                                                                                                              |
| SPM330    | The two CEMs have either come into datasync or have gone out of datasync. Correlates to an ISTB alarm.                                                                                                                                                                                                                                                                      |

**General SPM Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                             |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPM331    | A device had a protection switch failure. Modified to place IP RM in the circuit pack field. Correlates to a MANB, PROTFAIL, SYSB, ISTB, and NOSPARE alarm.                                             |
| SPM332    | The synchronization reference source was switched by manual action, switched by system action, or lost the last synchronization reference in the OC-3 protection group.                                 |
| SPM333    | Indicates an SPM Rex test failure.                                                                                                                                                                      |
| SPM334    | An alternate synchronization source is not available and the timing configuration no longer conforms to SONET specifications. Correlates to a CLKOOS alarm.                                             |
| SPM335    | A device had a protection switch failure.                                                                                                                                                               |
| SPM336    | The clock oscillator tuning range has reached 90% of the maximum range. Correlates to a VCXO90 alarm.                                                                                                   |
| SPM337    | SPM has entered Holdover. Correlates with SPM637.                                                                                                                                                       |
| SPM338    | SPM has been in Holdover over 24Hours. Correlates with SPM638.                                                                                                                                          |
| SPM339    | The clock oscillator tuning range has reached 70% of the maximum range. Correlates to a VCXO70 alarm.                                                                                                   |
| SPM340    | A CM warm switch of activity (SWACT) failed.                                                                                                                                                            |
| SPM341    | A SyncRM has entered into 3E Holdover state due to a clock mode change. Correlates with SPM641.                                                                                                         |
| SPM342    | A SyncRM has entered into 3E Holdover 24 State. Correlates with SPM642.                                                                                                                                 |
| SPM344    | The SyncRM Loss of BITS Redundancy (LOR) alarm has been set. Correlates with SPM644.                                                                                                                    |
| SPM350    | There is the potential for resource exhaustion of a particular resource type. Correlates to the COTLOW, DTMFLOW, MFLOW, TONESLOW, and ECANLOW alarms. The log also generates when the alarm is cleared. |
| SPM352    | Both of the Sync RMs are in holdover, so the SPM has entered Stratum 3E Holdover. Alarm ST3EHLDOVR is raised. Correlates with SPM652.                                                                   |
| SPM353    | Both of the Sync RMs are in holdover for 24 hours, so the SPM has entered Stratum 3E Holdover24. Alarm ST3EHLDOVR24 is raised. Correlates with SPM653.                                                  |
| SPM354    | Both of the Sync RMs are out-of-service, so the SPM has entered SMC holdover. Alarm SMCHLDOVR is raised. Correlates with SPM654.                                                                        |
| SPM355    | Both of the Sync RMs are out-of-service for 24 hours, so the SPM has entered SMC holdover24. Alarm SMCHLDOVR24 is raised. Correlates with SPM655.                                                       |
| SPM356    | One of the Sync RMs is out-of-service, so the SPM has lost clock unit redundancy. Alarm SPMLOCR is raised. Correlates with SPM656.                                                                      |
| SPM358    | A tuple change from EXTERNAL to LINE, or from LINE to EXTERNAL, is performed, and the SPM clock reference change failed. Correlates with SPM658.                                                        |
| SPM370    | A log report of an SPM health monitor event. Connection errors have been corrected by the DLC Audit. Correlates with SPM670, the clearing log.                                                          |

**General SPM Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                         |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPM399    | Generated whenever an SPM enters or leaves an overload condition. SN08 adds next text "SPM Overload Report" due to being triggered via resource exhaustion/overload conditions on the ATMRRM.                                       |
| SPM500    | A SyncRM device state change has occurred with new state and reason for change (e.g. SYSB, MANB). Modified to place IP RM in the circuit pack field. Correlates to a MANB, PROTFAIL, SYSB, and ISTB alarm.                          |
| SPM605    | Indicates that a particular resource RM protection group is excluded by the SPMRESALIGN tool, without align RMID-PWID values.                                                                                                       |
| SPM610    | Generated whenever an SPM node SSM value changes.                                                                                                                                                                                   |
| SPM611    | A reference node switch has occurred.                                                                                                                                                                                               |
| SPM630    | A device protection switch (i.e. clock unit switch) has occurred. Modified to place IP RM in the circuit pack field. Correlates to a MANB, SYSB, and ISTB alarm.                                                                    |
| SPM632    | Generated when the REX test on the SPM is successful.                                                                                                                                                                               |
| SPM633    | Generated when the REX test has started on an SPM node.                                                                                                                                                                             |
| SPM637    | The clock mode has changed from Holdover to Sync. Correlates with the HLDOVR alarm.                                                                                                                                                 |
| SPM638    | The SPM recovers from the 24-hour Holdover state; the clock mode changes from Holdover to Sync. Correlates to the HLDOVR24 alarm.                                                                                                   |
| SPM641    | A SyncRM has exited 3E Holdover state.                                                                                                                                                                                              |
| SPM642    | A SyncRM has exited 3E Holdover 24 state.                                                                                                                                                                                           |
| SPM644    | The SyncRM Loss of BITS Redundancy (LOR) alarm has been cleared.                                                                                                                                                                    |
| SPM645    | Link Protocol & Messaging Interface Controller (LPMIC) Event Report. This log is generated on every CEM and transported to the core. The log is generated periodically and whenever the number of events crosses a threshold value. |
| SPM650    | A successful in-service loading procedure has occurred. Modified to place IP RM in the circuit pack field.                                                                                                                          |
| SPM651    | An in-service loading procedure has failed. Modified to place IP RM in the circuit pack field.                                                                                                                                      |
| SPM652    | SPM has exited Stratum 3E Holdover. Alarm ST3EHLDOVR is cleared.                                                                                                                                                                    |
| SPM653    | SPM has exited Stratum 3E Holdover24. Alarm ST3EHLDOVR24 is cleared.                                                                                                                                                                |
| SPM654    | SPM has exited SMC Holdover. Alarm SMCHLDOVR is cleared.                                                                                                                                                                            |
| SPM655    | SPM has exited SMC Holdover24. Alarm SMCHLDOVR24 is cleared.                                                                                                                                                                        |
| SPM656    | SPM loss of clock unit redundancy cleared. Alarm SPMLOCR is cleared.                                                                                                                                                                |
| SPM657    | Input timing signals degradation cleared. Alarm SPMTLD is cleared.                                                                                                                                                                  |
| SPM658    | A PM timing mode change has occurred with explicit reason (e.g. line to external due to manual request).                                                                                                                            |

**General SPM Logs/Faults available**

| Log/Fault   | Description                                                                                                                                                                                                                                                                                                                             |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SPM660      | A continuous performance-monitored trunk member was involved in an answered echo canceller call. This log reports the performance data.                                                                                                                                                                                                 |
| SPM661      | A continuous monitoring ON/OFF command or an SPMECMON AUTO command has successfully completed.                                                                                                                                                                                                                                          |
| SPM670      | An INFO log to report that the health monitor "CallCount PTS no setup fault" has been cleared. Correlates with SPM370, the raise log.                                                                                                                                                                                                   |
| SPM680      | Indicates low MBM Application Buffers.                                                                                                                                                                                                                                                                                                  |
| SPM682      | Indicates CEM manual reset.                                                                                                                                                                                                                                                                                                             |
| SPM683      | Indicates the reason for CEM swact.                                                                                                                                                                                                                                                                                                     |
| SPM684      | Indicates that the erase flash command has initiated, is completed, has failed, or has been rejected. SN08 adds the aestivate/status of the unit/device.                                                                                                                                                                                |
| SPM701      | A DDM audit has successfully updated an SPM subgroup.                                                                                                                                                                                                                                                                                   |
| SPM702      | A DDM dynamic update has failed for an SPM subgroup.                                                                                                                                                                                                                                                                                    |
| SPM703      | A DDM audit has updated an SPM trunk member in a with a data entry for a trunk that failed to be added during a dynamic update.                                                                                                                                                                                                         |
| SPM704      | A DDM dynamic update has failed for an SPM trunk member.                                                                                                                                                                                                                                                                                |
| SPM705      | A trunk has been set to a lockout (LO) or SysB state. Correlates to SPM706.                                                                                                                                                                                                                                                             |
| SPM706      | A trunk has returned to service from a LO state.                                                                                                                                                                                                                                                                                        |
| SPM707      | A dynamic update has failed for the ISDNPARM table.                                                                                                                                                                                                                                                                                     |
| SPM708      | The DDM audit has updated the ISDNPARM table.                                                                                                                                                                                                                                                                                           |
| SPM709      | A dynamic update has failed for the ISDNPROT table.                                                                                                                                                                                                                                                                                     |
| SPM710      | The DDM audit has updated the ISDNPROT table.                                                                                                                                                                                                                                                                                           |
| SPRF670     | Generated every 15 minutes by the SPMACT tool. The logs are a compilation of the tool's results. Each line of the log corresponds to a performance measurement taken every minute by the tool.                                                                                                                                          |
| SPRF671     | Generated every 15 minutes by the SPUSAGE tool to summarize samples taken every minute of the call-processing events that occur in the SPM.                                                                                                                                                                                             |
| VOIP800 Log | This log is generated for any of the following reasons: <ul style="list-style-type: none"> <li>- Cyclical Redundancy Check Error- Broadcast Packets</li> <li>- Undersize Packets- Jitter</li> <li>- Oversize Packets- Latency</li> <li>- Fragments- Lost Packets</li> <li>- Jabber- Decoder Under run</li> <li>- Drop Events</li> </ul> |
| XAC329      | Enhanced to provide more detailed reason text description for a number of failure scenarios in IRM, including a link state change. A customized text string is added for each IRM error code to help determine the causes resulting from link failure events.                                                                           |

**General SPM Logs/Faults available**

| Log/Fault                | Description                                                                                                                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sync RM alarms</b>    |                                                                                                                                                                                                          |
| LOS                      | Sync RM cannot detect a signal from the BITS timing link. Cleared when a signal is detected.                                                                                                             |
| OOF                      | Sync RM cannot detect a DS1 frame for a given BITS timing link. Cleared when a DS1 frame is detected.                                                                                                    |
| AIS                      | Sync RM detects an AIS on an incoming BITS timing reference signal from BITS, or crossover from alternate SPM reference node. Cleared when incoming BITS timing reference signal does not have an alarm. |
| MTIE2                    | MTIE performance for input signal exceeds the GR-253 requirement mask threshold, indicating an unusable signal. Cleared when MTIE is below GR-253 requirement mask threshold.                            |
| TLD                      | MTIE performance for input signal exceeds the GR-253 requirement mask threshold, indicating a degraded signal. Cleared when the MTIE Level 1 degradation disappears from timing reference.               |
| BPV                      | Incoming signal has BPV alarm, indicating a degraded signal. Cleared when BPV disappears from timing reference.                                                                                          |
| CRC                      | SyncRM detects a CRC from incoming signal, indicating a degraded signal. Cleared when the CRC disappears from the timing reference.                                                                      |
| LOR                      | SyncRM cannot detect the DS1 frame from BITS timing links or signal from Mate SyncRM, indicating that redundancy is lost. Cleared when a DS1 frame is detected.                                          |
| HLDOVR                   | SyncRM has gone into the holdover mode because both BITS timing links were lost. Cleared when SyncRM exits holdover mode.                                                                                |
| Bearer connections alarm | An alarm for bearer connections is added to the list of alarms in table MNNODE.                                                                                                                          |

**Stormia (STM)-available logs/faults**

The following table lists the STM logs available. STM logs will only be present in the HLR market. For detailed information on logs, refer to NN10275-909, *Fault Management Log Reference*.

**STM logs available**

|        |                                             |
|--------|---------------------------------------------|
| STM398 | Indicates a raised alarm in an STM device.  |
| STM399 | Indicates a cleared alarm in an STM device. |

**MG4000-available logs/faults**

The following table lists the MG4000 logs available. MG 4000 supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this

document titled “IEMS Functionality.” For detailed information on logs, refer to NN10275-909, *Fault Management Log Reference*.

#### MG4000 logs available

|          |                                                      |
|----------|------------------------------------------------------|
| MG4I 300 | Media Integrity Failure                              |
| MG4I 301 | GigE Audit Failure                                   |
| MG4I 320 | Counter overflow in the Operational Measurement pegs |
| MG4I 501 | SCTP Core Connection State Change                    |
| MG4I 502 | SCTP Peer Connection State Change                    |

#### MG9000--available logs/faults

The following table lists the MG 9000 Faults available.

MG 9000 supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled “IEMS Functionality.” For details on the logs/faults themselves, refer to the Fault Management section of MG 9000 FCAPS documentation, NN10074-911 and NN10275-909, *Fault Management Log Reference*.

#### MG 9000 Faults available

| Network Element: MG 9000 |                                                                                                                                                                                                                                                                                     |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fault                    | Description                                                                                                                                                                                                                                                                         |
| MGAUxxx                  | Generated when audit task starts.                                                                                                                                                                                                                                                   |
| MGAUxxx                  | Generated when audit task is paused.                                                                                                                                                                                                                                                |
| MGAUxxx                  | Generated when audit task is resumed.                                                                                                                                                                                                                                               |
| MGAUxxx                  | Generated when audit task is completed with a summary of corrections.                                                                                                                                                                                                               |
| MGAUxxx                  | Generated when audit schedule is deleted.                                                                                                                                                                                                                                           |
| MGAUxxx                  | Generated when audit could not correct a mismatch.                                                                                                                                                                                                                                  |
| BW300                    | Reserved bandwidth used on the indicated shelf has exceeded the Bandwidth Congestion Threshold. Correlates with Warning alarm bwResBandwShelfFault.                                                                                                                                 |
| BW301                    | Reserved bandwidth use on the network interface has exceeded the Bandwidth Congestion Threshold. The alarm is cleared when reserved bandwidth on the network interface is 10% less than the threshold. Correlates with Warning alarm bwResBandwTotalFault.                          |
| BW302                    | Reserved bandwidth dedicated to switched lines connections on the network interface has exceeded the Bandwidth Congestion Threshold with respect to the amount of bandwidth configured the network interface for switched lines. Correlates with Warning alarm bwResBandwSloaFault. |

**MG 9000 Faults available**

|        |                                                                                                                                                                                                                                                                               |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BW304  | An overall cell queue congestion alarm has occurred when overall atm cell queue is at least 90% full, or the alarm has been cleared. Correlates with Warning alarm bwSwitchFabricTotalFault.                                                                                  |
| BW305  | A CBR cell queue congestion alarm has occurred or been cleared. To occur, atm cell queue for this service type is at least 90% full. Correlates with Warning alarm bwSwitchFabricCbrFault.                                                                                    |
| BW306  | An RT-VBR cell queue congestion alarm has occurred or been cleared. To occur, atm cell queue for this service type is at least 90% full. Correlates with Warning alarm bwSwitchFabricRtVbrFault.                                                                              |
| BW307  | An NRT-VBR cell queue congestion alarm has occurred or been cleared. To occur, atm cell queue for this service type is at least 90% full. Correlates with Warning alarm bwSwitchFabricNrtVbrFault.                                                                            |
| BW308  | A UBR cell queue congestion alarm has occurred or been cleared. To occur, atm cell queue for this service type is at least 90% full. Correlates with Warning alarm bwSwitchFabricUbrFault.                                                                                    |
| BW309  | A UBR-plus cell queue congestion alarm has occurred or been cleared. To occur, atm cell queue for this service type is at least 90% full. Correlates with Warning alarm bwSwitchFabricUbrPlusFault.                                                                           |
| BW310  | A control channel cell queue congestion alarm has occurred or been cleared. To occur, atm cell queue for this service type is at least 90% full. Correlates with Warning alarm bwSwitchFabricControlFault.                                                                    |
| BW311  | Reserved bandwidth dedicated to ABI lines connections on the network interface has exceeded the Bandwidth Congestion Threshold with respect to the amount of bandwidth configured the network interface for switched lines. Correlates with Warning alarm bwResBandwAbiFault. |
| CES305 | No cells are being received from the ATM network. Correlates with Major alarm cesLossOfCell.                                                                                                                                                                                  |
| ESA300 | Communication between GWC and GW is lost. Entered ESA mode. Correlates with Critical alarm Entered ESA.                                                                                                                                                                       |
| ESA302 | This log corresponds to the nnESADownloadFault.                                                                                                                                                                                                                               |
| ESA304 | Generated by the EM in response to a Major alarm from the MG9000 (nnEsaColFault) trap. The MG9000 sends this trap when it detects communication problems to other nodes in the same community of interest.                                                                    |
| ESA312 | Generated by the EM when a failure occurs while trying to provision internodal community of interest data for a given NE (Major alarm).                                                                                                                                       |
| ESA601 | ESA601 is generated from alarm nnESAFault. This alarm was added in Gateway to notify the data inconsistency when MG 9000 finds internal ESA data mapping inconsistency after the ESA data downloading is completed.                                                           |
| ESA602 | ESA602 is generated from alarm nnESARetrieveFault, an alarm generated by the EM for ESA Data Retrieval failure.                                                                                                                                                               |



**MG 9000 Faults available**

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ESA fault<br>nnESADownloadFault | Indicates a failure to download ESA data to a given VMG. This alarm will only be generated for autonomous download attempts. This was indicated by a log in releases previous to SN08.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| GIGE alarms                     | <p>301 LOS Loss of Signal, Critical</p> <p>302 RFI Remote Failure Indication, Critical</p> <p>304 TEM Temperature Threshold Exceeded, Critical</p> <p>305 POW Low power indicated, Critical</p> <p>306 RxSD Receive Signal Degraded, Critical</p> <p>307 RxEED Receive Excessive Error Ratio, Critical</p> <p>308 TBC Transmit Bias Current, Critical</p> <p>309 LINT Link Initialization, Critical</p> <p>310 OPT Transmit Optical Power, Critical</p> <p>311 OPR Receive Optical Power, Critical</p> <p>312 GARP GARP Failure, Critical</p> <p>313 LKINT Link Integrity Failure, Critical</p> <p>314 AUTONEG Auto Negotiation Failure, Critical</p> <p>315 NONPREFLINK Non-preferred Link is active, Critical</p>                                                                                                                                                 |
| GIGE logs                       | <p>GIGE301 Indicates a Communications Subsystem Failure, loss of signal.</p> <p>GIGE302 Indicates a Communications Subsystem Failure, remote failure.</p> <p>GIGE303 Indicates a Communications Subsystem Failure, transmit failure.</p> <p>GIGE304 Indicates a Communications Subsystem Failure, temperature threshold exceeded.</p> <p>GIGE306 Indicates a Communications Subsystem Failure, low power indicated.</p> <p>GIGE307 Indicates a Communications Subsystem Failure, transmit excessive error ratio.</p> <p>GIGE308 Indicates a Communications Subsystem Failure, transmit bias current.</p> <p>GIGE309 Indicates a Communications Subsystem Failure, link initialization.</p> <p>GIGE310 Indicates a Communications Subsystem Failure, transmit optical power.</p> <p>GIGE311 Indicates a Communications Subsystem Failure, receive optical power.</p> |



**MG 9000 Faults available**

|                                     |                                                                                                                                                                    |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | GIGE312 Indicates a Communications Subsystem Failure, GARP failure.                                                                                                |
|                                     | GIGE313 Indicates a Communications Subsystem Failure, link integrity failure.                                                                                      |
|                                     | GIGE314 Indicates a Communications Subsystem Failure, autonegotiation failure.                                                                                     |
|                                     | GIGE315 Indicates a Communications Subsystem Failure, non-preferred link is active.                                                                                |
| HW Mismatch alarm                   | The Hardware Mismatch alarm indicates an incorrect replacement card has been installed.                                                                            |
| QoS alarms                          | New QoS alarms are generated when any of four configured threshold parameters are exceeded. The alarm browser (at the VMG level) is extended to view these alarms. |
| Provisioning failure logs           | If an operation fails when provisioning Tone, Class, or Physical Ringing data, a customer log is generated.                                                        |
| "Authorization Failed" Security Log | Generated when a user attempts to perform an unauthorized action.                                                                                                  |
| MG9K Server Log                     | A warning log generated when the MG9K server is either starting up or shutting down.                                                                               |
| MGCA301                             | Loss of signal fault has occurred or been cleared. Correlates with Critical alarm LOS (on OC3) or Minor alarm los (on DS1).                                        |
| MGCA302                             | Alarm indication signal fault has occurred or been cleared. Correlates with Critical alarm AIS (on OC3) or Minor alarm ais (on DS1).                               |
| MGCA303                             | Loss of frame fault has occurred or been cleared. Correlates with Critical alarm LOF (on OC3) or Minor alarm lof (on DS1).                                         |
| MGCA304                             | Remote alarm indication. Correlates with Minor alarm RAI (on DS1).                                                                                                 |
| MGCA305                             | Bit error rate signal fault has occurred or been cleared. Correlates with Critical alarm bit error ratio signal default (BERSF) (on OC3).                          |
| MGCA306                             | Bit error rate signal degraded fault has occurred or been cleared. Correlates with Major alarm bit error ratio signal default (BERSD) (on OC3).                    |
| MGCA307                             | Remote defect indication fault has occurred or been cleared. Correlates with Minor alarm remote defect indication (RDI) (on OC3).                                  |
| MGCA308                             | Path label mismatch fault has occurred or been cleared. Correlates with Minor alarm alarm path label mismatch (PLM) (on OC3).                                      |
| MGCA309                             | Loss of pointer fault has occurred or been cleared. Correlates with Minor alarm loss of pointer (LOP) (on OC3).                                                    |
| MGCA310                             | An unequipped fault has occurred or been cleared. Correlates with Minor alarm UNEQ (on OC3).                                                                       |
| MGCA311                             | Loss of cell delineation fault has occurred or been cleared (supported in EM only). Correlates with alarm LOD.                                                     |
| MGCA312                             | IMA link- Loss of IMA Frame. Correlates with Minor alarm imaLinkLif.                                                                                               |
| MGCA313                             | IMA link- Loss of delayed synchronization. Correlates with Minor alarm imaLinkLods.                                                                                |

**MG 9000 Faults available**

|         |                                                                                                                                                                                                                                                          |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MGCA314 | IMA link- Remote failure indication. Correlates with Minor alarm imaLinkRfi.                                                                                                                                                                             |
| MGCA315 | IMA link- Transmit misconnect. Correlates with Minor alarm imaLinkTxMisConnect.                                                                                                                                                                          |
| MGCA316 | IMA link- receive misconnect. Correlates with Minor alarm imaLinkRxMisConnect.                                                                                                                                                                           |
| MGCA317 | IMA link- transmit fault. Correlates with Minor alarm imaLinkTxFault.                                                                                                                                                                                    |
| MGCA318 | IMA link- receive fault. Correlates with Minor alarm imaLinkRxFault.                                                                                                                                                                                     |
| MGCA319 | IMA link- transmit unusable far end. Correlates with Minor alarm imaLinkTxUnusableFe.                                                                                                                                                                    |
| MGCA320 | IMA link- receive unusable far end. Correlates with Minor alarm imaLinkRxUnusableFe.                                                                                                                                                                     |
| MGCA321 | IMA group startup far end. Correlates with Major alarm imaGroupStartupFe.                                                                                                                                                                                |
| MGCA322 | IMA group configuration abort. Correlates with Critical alarm imaGroupCfgAbort.                                                                                                                                                                          |
| MGCA323 | IMA group configuration abort far end. Correlates with Major alarm imaGroupCfgAbortFe.                                                                                                                                                                   |
| MGCA324 | IMA group insufficient links. Correlates with Critical alarm imaGroupInsuffLinks.                                                                                                                                                                        |
| MGCA325 | IMA group insufficient links far end. Correlates with Major alarm imaGroupInsuffLinksFe.                                                                                                                                                                 |
| MGCA326 | IMA group blocked far end. Correlates with Minor alarm imaGroupBlockedFe.                                                                                                                                                                                |
| MGCA327 | IMA group timing synchronization. Correlates with Major alarm imaGroupTimingSynch.                                                                                                                                                                       |
| MGCA328 | ABI Loss of Clock on DS512 optical link. Correlates with Critical alarm abiLossOfClock.                                                                                                                                                                  |
| MGCA329 | ABI Loss of Frame on DS512 optical link. Correlates with Critical alarm abiLossOfFrame.                                                                                                                                                                  |
| MGCA330 | ABI Loss of Signal (low light level) on DS512 optical link. Correlates with Critical alarm abiLowLightLevel.                                                                                                                                             |
| MGCA331 | ABI Channel parity error on DS512 optical link. Correlates with Minor alarm abiChannelParityError.                                                                                                                                                       |
| MGCA332 | SDH Path Trace Identifier Mismatch Alarm (only applies to SDH and not SONET). The Path Trace Identifier being seen by the OC3 card at the carrier Path level does not match what has been provisioned for that carrier. Correlates with Minor alarm tim. |
| MGCA333 | AlarmIndicationSignal (ds3ais) generates log MGCA333 when an AlarmIndicationSignal fault is received from the Gateway.                                                                                                                                   |
| MGCA334 | LossofFrame (ds3lof) generates log MGCA334 when a LossOfFrame fault is received from the Gateway.                                                                                                                                                        |
| MGCA335 | RemoteAlarmIndication (ds3rai) generates log MGCA335 when a RemoteAlarmIndication fault is received from the Gateway.                                                                                                                                    |
| MGEM300 | Generated when MG9000 EM is not able to make connection to the Element Manager Database. Correlates with Major alarm EmDbUnavailable.                                                                                                                    |
| MGEM301 | In SN06, the NE301 log name changed toMGEM301. Generated when the MG 9000 Manager loses SNMP communication with the MG 9000. Correlates with Critical alarm CommsLostToNE.                                                                               |

**MG 9000 Faults available**

|         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MGEM302 | In SN06, NE302 log name changed to MGEM302. The MG9000 Manager has added an ne MG9000 and tries to discover the NE. It will check the MG9000 EM IP address provisioned at the MG9000 and if it is incorrect will raise this alarm. Correlates with Major alarm invalidEMIPAddress.                                                                                                                                                                                                                                                                                                                                                                    |
| MGEM303 | In SN06, the NE303 log name changed to MGEM303. The description of t his log is restored faults: "Faults seen while active." Diagnostics will not clear restored faults. The card with the restored faults may not be in the same state it was in before the restart that caused the faults to be restored. The MG9000 sends too many alarms within a 5 second window. When this happens the MG9000 Manager will request this particular MG9000 stop sending Alarms and display this particular alarm. This condition will clear when the number of alarm within 5 sec falls below a set number. Correlates with Critical alarm AlarmsBeingThrottled. |
| MGEM704 | Indicates that an attempt to correct the database has failed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| MGEM705 | Indicates that the Database is unavailable and correction failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| MGEM714 | Raised each time the MG9K Upgrade Tool is executed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| NE300   | In SN06, the NE300 log (corresponding to all NorNode Faults) split into several logs (grouped according to the clearing procedures). Log NE300 should only be generated if the GW is running on pre-SN06 loads and the MGEM is running on SN06+ loads. It is purely for backward compatibility.                                                                                                                                                                                                                                                                                                                                                       |
| NE301   | The NE301 log (Critical) is generated when an incorrect replacement card has been installed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NE302   | The NE302 log indicates software faults of any severity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| NE303   | The NE303 log indicates restored faults: "Faults seen while active." Diagnostics will not clear restored faults. The card with the restored faults may not be in the same state it was in before the restart that caused the faults to be restored.                                                                                                                                                                                                                                                                                                                                                                                                   |
| NE304   | The NE304 log indicates faults that are ambiguous with regard to the card that is causing the fault. Usually, the alarm on card A indicates that there is a problem on card A, card B, or the link in between card A and B.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| NE305   | The NE305 log indicates serial device faults of any severity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| NE306   | The NE306 log indicates GLAN-related faults of any severity. The GLAN hub is located on the active ITP in the shelf where the fault appears.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| NE307   | The NE307 log indicates ABI faults of any severity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| NE308   | The NE308 log indicates inband messaging faults of any severity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| NE309   | The NE309 log indicates clock sync faults of any severity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| NE310   | The NE310 log indicates unused hardware faults of any severity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| NE311   | The NE311 log indicates time of day faults of any severity - attempts to access the provisioned time server have failed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| NE312   | The NE312 log indicates cable faults of any severity -- one of the cables to the ITPs has been connected in an unsupported way.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

**MG 9000 Faults available**

|         |                                                                                                                                                                                                              |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| NE313   | The NE313 log indicates an activity cable fault of any severity; the activity control cable is a small cable on the front of the ABI cards that is used for activity determination.                          |
| NE314   | The NE314 log indicates backplane faults of any severity; the carriers between the two DCC cards cannot communicate.                                                                                         |
| NE315   | The NE315 log indicates bandwidth fault of any severity; some of the carriers are not providing bandwidth.                                                                                                   |
| NE316   | The NE316 log indicates line alarms of any severity.                                                                                                                                                         |
| NE317   | The NE317 log indicates shelf faults of any severity.                                                                                                                                                        |
| NE318   | The NE318 log indicates proxy alarms of any severity; the card referred to in the alarm text (description) is not communicating.                                                                             |
| NE319   | The NE319 log indicates MTA alarms of any severity.                                                                                                                                                          |
| NE320   | The NE320 log indicates data audit faults of any severity; data audit required.                                                                                                                              |
| NE609   | A software image log generated whenever a user executes an image request.                                                                                                                                    |
| OMC300  | Indicates that the OM Collector failed to collect OM files from the MG9K during a particular collection interval. Also indicates that the OM Collector is able to restart collecting OM files from the MG9K. |
| OVLD808 | (Critical) Indicates that an external messaging link has closed and cannot send/receive message.                                                                                                             |
| OVLD809 | (Major) Indicates that the message loss is high enough such that the message link is in a degraded service state.                                                                                            |
| OVLD810 | (Minor) Indicates message retransmissions are high enough that system is starting to see performance degradation.                                                                                            |
| SHLF301 | SIC talk battery A alarm occurs. Correlates with Critical alarm shelfTalkBatteryA.                                                                                                                           |
| SHLF302 | SIC talk battery B alarm occurs. Correlates with Critical alarm shelfTalkBatteryB.                                                                                                                           |
| SHLF303 | SIC signal battery A alarm occurs. Correlates with Major alarm shelfSignalBatteryA.                                                                                                                          |
| SHLF304 | SIC signal battery B alarm occurs. Correlates with Major alarm shelfSignalBatteryB.                                                                                                                          |
| SHLF305 | SIC signal battery A fuse alarm occurs. Correlates with Major alarm shelfSignalBatteryAfuse.                                                                                                                 |
| SHLF306 | SIC signal battery B fuse alarm occurs. Correlates with Major alarm shelfSignalBatteryBfuse.                                                                                                                 |
| SHLF307 | SIC shelf fail LED alarm occurs. Correlates with alarm shelfFailLED.                                                                                                                                         |
| SHLF308 | BIP signal battery A1 alarm occurs. Correlates with Major alarm bipSignalBatteryA1.                                                                                                                          |
| SHLF309 | BIP signal battery A2alarm occurs. Correlates with Major alarm bipSignalBatteryA2.                                                                                                                           |
| SHLF310 | SIC talk battery B1 alarm occurs. Correlates with Major alarm bipSignalBatteryB1.                                                                                                                            |
| SHLF311 | BIP signal battery B2 alarm occurs. Correlates with Major alarm bipSignalBatteryB2.                                                                                                                          |
| SHLF312 | BIP talk battery A alarm occurs. Correlates with Minor alarm bipTalkBatteryA.                                                                                                                                |

**MG 9000 Faults available**

|         |                                                                                                     |
|---------|-----------------------------------------------------------------------------------------------------|
| SHLF313 | BIP talk battery B alarm occurs. Correlates with Minor alarm bipTalkBatteryB.                       |
| SHLF314 | BIP filter A fail alarm occurs. Correlates with Minor alarm bipFilterA.                             |
| SHLF315 | BIP filter B fail alarm occurs. Correlates with Minor alarm bipFilterB.                             |
| SHLF316 | BIP scan point 1 is activated. Correlates with alarm bipScanPoint1.                                 |
| SHLF317 | BIP scan point 2 is activated. Correlates with alarm bipScanPoint2.                                 |
| SHLF318 | BIP scan point 3 is activated. Correlates with alarm bipScanPoint3.                                 |
| SHLF319 | BIP scan point 4 is activated. Correlates with alarm bipScanPoint4.                                 |
| SHLF320 | BIP scan point 5 is activated. Correlates with alarm bipScanPoint5.                                 |
| SHLF321 | BIP scan point 6 is activated. Correlates with alarm bipScanPoint6.                                 |
| SHLF322 | BIP scan point 7 is activated. Correlates with alarm bipScanPoint7.                                 |
| SHLF323 | BIP scan point 8 is activated. Correlates with alarm bipScanPoint8.                                 |
| SHLF324 | BIP scan point 9 is activated. Correlates with alarm bipScanPoint9.                                 |
| SHLF325 | BIP scan point 10 is activated. Correlates with alarm bipScanPoint10.                               |
| SHLF326 | BIP scan point 11 is activated. Correlates with alarm bipScanPoint11.                               |
| SHLF327 | Talk Battery A1 Power Feed. Correlates with Major alarm bipTalkBatteryA1.                           |
| SHLF328 | Talk Battery A Power Feed. Correlates with Major alarm bipTalkBatteryA2.                            |
| SHLF329 | Talk Battery B1 Power Feed. Correlates with Major alarm bipTalkBatteryB1.                           |
| SHLF330 | Talk Battery B2 Power Feed. Correlates with Major alarm bipTalkBatteryB2.                           |
| SHLF331 | BIP circuit breaker fan alarm occurs (EM only). Correlates with Minor alarm bipFanBreaker.          |
| SHLF332 | BIP environmental control unit 0 temperature alarm occurs. Correlates with Minor alarm bipEcuTemp0. |
| SHLF333 | BIP environmental control unit 1 temperature alarm occurs. Correlates with Minor alarm bipEcuTemp1. |
| SHLF334 | BIP environmental control unit 0 fan alarm occurs. Correlates with Minor alarm bipEcuFan0.          |
| SHLF335 | BIP environmental control unit 1 fan alarm occurs. Correlates with Minor alarm bipEcuFan1.          |
| SHLF336 | BIP remote alarm cut off alarm occurs. Correlates with alarm bipRemoteAlarmcutoff.                  |
| SHLF337 | BIP local alarm cut off alarm occurs. Correlates with alarm bipLocalAlarmcutoff.                    |
| SHLF338 | BIP ABS fuse fail alarm occurs. Correlates with Major alarm bipAbsFusefail.                         |
| SHLF339 | BIP ABS battery power supply alarm occurs. Correlates with Critical alarm bipAbsPowerSupply.        |
| SHLF340 | BIP shelf circuit breaker trip alarm occurs. Correlates with Major alarm bipShfBreakerTrip.         |
| SHLF341 | Presence of BIP's Current-Sense Card A. Correlates with Major alarm bipCsApresence.                 |

**MG 9000 Faults available**

|         |                                                                                                                                                      |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| SHLF342 | Presence of BIP's Current-Sense Card B. Correlates with Major alarm bipCsBpresence.                                                                  |
| SHLF343 | Presence of BIP's Alarm Relay Card. Correlates with Major alarm bipAlmRelayPresence.                                                                 |
| SHLF344 | Current-Sense Card A Shelf 0 High Threshold exceeded. Correlates with Minor bipCSAshf0HighThres alarm.                                               |
| SHLF345 | Current-Sense Card A Shelf 1 High Threshold exceeded. Correlates with Minor bipCSAshf1HighThres alarm.                                               |
| SHLF346 | Current-Sense Card A Shelf 2 High Threshold exceeded. Correlates with Minor bipCSAshf2HighThres alarm.                                               |
| SHLF347 | Current-Sense Card A Shelf 3 High Threshold exceeded. Correlates with Minor bipCSAshf3HighThres alarm.                                               |
| SHLF348 | Current-Sense Card B Shelf 0 High Threshold exceeded. Correlates with Minor bipCSBshf0HighThres alarm.                                               |
| SHLF349 | Current-Sense Card B Shelf 1 High Threshold exceeded. Correlates with Minor bipCSBshf1HighThres alarm.                                               |
| SHLF350 | Current-Sense Card B Shelf 2 High Threshold exceeded. Correlates with Minor bipCSBshf2HighThres alarm.                                               |
| SHLF351 | Current-Sense Card B Shelf 3 High Threshold exceeded. Correlates with Minor bipCSBshf3HighThres alarm.                                               |
| SHLF352 | Current High Temperature Threshold exceeded. Correlates with Minor bipTempHighThres alarm.                                                           |
| SHLF353 | Current-Sense Card A Shelf 0 Low Threshold exceeded. Correlates with Minor bipCSAshf0LowThres alarm.                                                 |
| SHLF354 | Current-Sense Card A Shelf 1 Low Threshold exceeded. Correlates with Minor bipCSAshf1LowThres alarm.                                                 |
| SHLF355 | Current-Sense Card A Shelf 2 Low Threshold exceeded. Correlates with Minor bipCSAshf2LowThres alarm.                                                 |
| SHLF356 | Current-Sense Card A Shelf 3 Low Threshold exceeded. Correlates with Minor bipCSAshf3LowThres alarm.                                                 |
| SHLF357 | Current-Sense Card B Shelf 0 Low Threshold exceeded. Correlates with Minor bipCSBshf0LowThres alarm. Correlates with Minor bipCSBshf1LowThres alarm. |
| SHLF358 | Current-Sense Card B Shelf 1 Low Threshold exceeded. Correlates with Minor bipCSBshf1LowThres alarm.                                                 |
| SHLF359 | Current-Sense Card B Shelf 2 Low Threshold exceeded. Correlates with Minor bipCSBshf2LowThres alarm.                                                 |
| SHLF360 | Current-Sense Card B Shelf 3 Low Threshold exceeded. Correlates with Minor bipCSBshf3LowThres alarm.                                                 |
| SHLF361 | Current Low Temperature Threshold exceeded. Correlates with Minor bipTempLowThres alarm.                                                             |
| SHLF362 | Status of the Signal Battery Fuse. Correlates with Major bipSignalBatteryFuse alarm.                                                                 |

**MG 9000 Faults available**

|         |                                                                                 |
|---------|---------------------------------------------------------------------------------|
| SHLF363 | Status of Talk Battery A Fuse. Correlates with Major bipTalkBatteryAFuse alarm. |
| SHLF364 | Status of Talk Battery B Fuse. Correlates with Major bipTalkBatteryBFuse alarm. |
| SHLF365 | Status of Cooling Unit 0 Fuse. Correlates with Minor bipEcuFuse0 alarm.         |
| SHLF366 | Status of Cooling Unit 1 Fuse. Correlates with Minor bipEcuFuse1 alarm.         |
| SHLF367 | Status of the End-Aisle Fuse. Correlates with Minor bipEndAisleFuse alarm.      |
| SHLF368 | BIP Signal Distribution Point 1. Correlates with bipSignalDistribution1 alarm.  |
| SHLF369 | BIP Signal Distribution Point 2. Correlates with bipSignalDistribution2 alarm.  |
| SHLF370 | BIP Signal Distribution Point 3. Correlates with bipSignalDistribution3 alarm.  |
| SHLF371 | BIP Signal Distribution Point 4. Correlates with bipSignalDistribution4 alarm.  |
| SHLF372 | BIP Visual Critical. Correlates with bipVisualCritical alarm.                   |
| SHLF373 | BIP Visual Major. Correlates with bipVisual Major alarm.                        |
| SHLF374 | BIP Visual Minor. Correlates with bipVisualMinor alarm.                         |
| SHLF375 | BIP Audible Critical. Correlates with bipAudibleCritical alarm.                 |
| SHLF376 | BIP Audible Major. Correlates with bipAudibleMajor alarm.                       |
| SHLF377 | BIP Audible Minor. Correlates with bipAudibleMinor alarm.                       |
| SHLF378 | BIP Alarm CutOff LED. Correlates with bipAlarmCutOffLED alarm.                  |
| SHLF379 | BIP Talk Battery A Fail LED. Correlates with bipTalkBatteryFailALED alarm.      |
| SHLF380 | BIP Talk Battery B Fail LED. Correlates with bipTalkBatteryFailBLED alarm.      |
| SHLF381 | BIP Critical LED Bank. Correlates with bipCriticalLEDbank alarm.                |
| SHLF382 | BIP Major LED Bank. Correlates with bipMajorLEDbank alarm.                      |
| SHLF383 | BIP Minor LED Bank. Correlates with bipMinorLEDbank alarm.                      |
| SHLF384 | BIP Environmental Control Unit 0 LED. Correlates with bipEcu1LED alarm.         |
| SHLF385 | BIP Environmental Control Unit 1 LED. Correlates with bipEcu2LED alarm.         |
| SHLF386 | BIP Alarm Processor Card Fail LED. Correlates with bipAlarmFailedLED alarm.     |
| SHLF387 | BIP Aisle Alarm. Correlates with bipAisleAlarm alarm.                           |
| SHLF388 | BIP Frame Alarm. Correlates with bipFrameFail alarm.                            |
| SHLF389 | Presence of BIP's Alarm Relay Card LED. Correlates with bipAlmRelayLed alarm.   |
| SHLF390 | Status of Current-Sense Card A LED. Correlates with bipCsAled alarm.            |
| SHLF391 | Status of Current-Sense Card B LED. Correlates with bipCsBled alarm.            |
| SHLF392 | Generated when a shelfCompatibility fault is received from the MG9kEM server.   |
| SHLF393 | Generated when a cardDiscovery fault is received from the MG9kEM server.        |



**MG 9000 Faults available**

|         |                                                                                                                                                                                                                                                         |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SHLF501 | A catch-all INFO log for all shelf events. Changed in SN06 to show a Severity of Indeterminate, which means no priority has been assigned to the related BIP event. If a severity had been datafilled, then SHLF383 would generate instead of SHLF 501. |
| SWLN301 | Line in Fault occurred or is cleared. Correlates with Minor lineFault alarm.                                                                                                                                                                            |
| SWLN302 | Hazardous Voltage line fault occurred or is cleared. Correlates with Minor alarm lineProtectionFault.                                                                                                                                                   |
| SWLN303 | Line in Babbling state line fault occurred or is cleared. Correlates with Minor alarm lineBabbleState.                                                                                                                                                  |
| VC301   | Minor: atmVcl Alarm indication signal. Correlates with Minor alarm vclTpAis.                                                                                                                                                                            |
| VC302   | Minor: atmVcl Remote Detection Indicator. Correlates with Minor alarm vclTpRdi.                                                                                                                                                                         |
| VC303   | Minor: loss of continuity, vcl. Correlates with Minor alarm vclLoc.                                                                                                                                                                                     |
| VC304   | Minor: atmVcc Alarm indication signal. Correlates with Minor alarm vccTpAis.                                                                                                                                                                            |
| VC305   | Minor: atmVcc Remote Detection Indicator. Correlates with Minor alarm mvccTpRdi.                                                                                                                                                                        |
| VC306   | Minor: loss of continuity, vcc. Correlates with Minor alarm vccLoc.                                                                                                                                                                                     |
| VC307   | Minor: loss of cell delineation on If (only on the EM). Correlates with alarm atmLcd.                                                                                                                                                                   |
| VMG300  | Generated when Root Termination goes out of service (Communication between Gateway and GWC is lost and ESA is not enabled). Correlates with Critical alarm VMG OOS.                                                                                     |
| VMG301  | QoS Alarm that is generated when the number of bad call reaches a certain threshold.                                                                                                                                                                    |
| VMG302  | QoS Alarm that is generated when the number of Packet Loss reaches a certain threshold.                                                                                                                                                                 |
| VMG303  | QoS Alarm that is generated when IP message Jitter reaches a certain threshold.                                                                                                                                                                         |
| VMG304  | QoS Alarm that is generated when IP message Latency reaches a certain threshold.                                                                                                                                                                        |
| VMG322  | Generated when a vMGAdminStatusOutOfService fault is received from the MG9kEM server (Warning).                                                                                                                                                         |
| VMG323  | Generated when a cardLocked fault is received from the MG9kEM server (Warning).                                                                                                                                                                         |
| VMG324  | Generated when a cardDisabled fault is received from the MG9kEM server (Warning).                                                                                                                                                                       |
| VMG325  | Generated when a cardInitializing fault is received from the MG9kEM server (Warning).                                                                                                                                                                   |
| VMG328  | Generated when a lineMtceNotReady fault is received from the MG9kEM server (Critical).                                                                                                                                                                  |
| VMG329  | Generated when a MegacoMtceNotReady fault is received from the MG9kEM server (Critical).                                                                                                                                                                |
| VMG373  | Generated when a GWCUnreachable fault is received from the MG9kEM server (Critical).                                                                                                                                                                    |
| VMG374  | Generated when a noReplyFromGWC fault is received from the MG9kEM server.                                                                                                                                                                               |
| VMG376  | Generated when an aal1BearerSubsystem OnPairNotReady fault is received from the MG9kEM server.                                                                                                                                                          |



**MG 9000 Faults available**

|                                          |                                                                                                                        |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| VMG377                                   | Generated when an ipBearerSubsystem OnPairNotReady fault is received from the MG9kEM server.                           |
| VMG600                                   | Indicates that termination data was successfully provisioned in all appropriate areas except for the database.         |
| VMG601                                   | Indicates that an attempt to correct termination data in the database has passed.                                      |
| VMG Admin State is OOS                   | Generated when a vMGAdminStatusOutOfService fault is received from the MG9kEM server (Warning). Relates to log VMG322. |
| VMG Initializing                         | Generated when a cardInitializing fault is received from the MG9kEM server (Warning). Relates to log VMG325.           |
| VMG OOS-card locked                      | Generated when a cardLocked fault is received from the MG9kEM server (Warning). Relates to log VMG323.                 |
| VMG OOS-card disabled                    | Generated when a cardDisabled fault is received from the MG9kEM server (Warning). Relates to log VMG324.               |
| VMG OOS- Line Maintenance is not Ready   | Generated when a lineMtceNotReady fault is received from the MG9kEM server (Critical). Relates to log VMG328.          |
| VMG OOS- Megaco Maintenance is not Ready | Generated when a MegacoMtceNotReady fault is received from the MG9kEM server (Critical). Relates to log VMG329.        |
| VMG OOS- GWC is not reachable            | Generated when a GWCUnreachable fault is received from the MG9kEM server (Critical). Relates to log VMG373.            |
| VMG OOS- no reply from GWC               | Generated when a noReplyFromGWC fault is received from the MG9kEM server. Relates to log VMG374.                       |
| VMG OOS- AAL1 bearer subsystem not ready | Generated when an aal1BearerSubsystem OnPairNotReady fault is received from the MG9kEM server. Relates to log VMG376.  |
| VMG OOS- IP bearer subsystem not ready   | Generated when an ipBearerSubsystem OnPairNotReady fault is received from the MG9kEM server. Relates to log VMG377.    |
| XDSL301                                  | Generated when a loss of signal - local modem fault occurs. Correlates with Minor alarm losATUC.                       |
| XDSL302                                  | Generated when a loss of frame - local modem fault occurs. Correlates with Minor alarm lofATUC.                        |
| XDSL303                                  | Generated when a loss of power - local modem fault occurs. Correlates with Critical alarm lprATUC.                     |
| XDSL304                                  | Generated when a loss of link - local modem fault occurs. Correlates with Minor alarm loIATUC.                         |
| XDSL305                                  | Generated when a loss of signal - remote modem fault occurs. Correlates with Minor alarm losATUR.                      |
| XDSL306                                  | Generated when a loss of frame - remote modem fault occurs. Correlates with Minor alarm lofATUR.                       |

**MG 9000 Faults available**

|                                                          |                                                                                                                                                                                |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| XDSL307                                                  | Generated when a loss of power - remote modem fault occurs. Correlates with Minor alarm lprATUR.                                                                               |
| XDSL308                                                  | Generated when a loss of link - remote modem fault occurs. Correlates with Minor alarm loIATUR.                                                                                |
| XDSL309                                                  | Generated when a no modem present fault occurs. Correlates with Minor alarm aturNotPresent.                                                                                    |
| XDSL310                                                  | Generated when a local modem clock failure occurs. Correlates with Critical alarm noClock.                                                                                     |
| XDSL311                                                  | Generated when a protocol error occurs. Correlates with Critical alarm handshakeFail.                                                                                          |
| XDSL312                                                  | Generated when a configuration error occurs. Correlates with Critical alarm linkMismatch.                                                                                      |
| XDSL313                                                  | Generated when an ATM traffic dropped at WAC upstream fault occurs. Correlates with Critical alarm vpiNonzero.                                                                 |
| XDSL314                                                  | Generated when a loss of sync of ATM cells - upstream fault occurs. Correlates with Critical alarm lcdIATUC.                                                                   |
| XDSL315                                                  | Generated when a loss of sync of ATM cells - downstream fault occurs. Correlates with Critical alarm lcdIATUR.                                                                 |
| XDSL316                                                  | Generated when a local modem Critical failure - not responding, in Kernel mode, download failure, or message corrupted fault occurs. Correlates with Critical alarm failIATUC. |
| XDSL317                                                  | Generated when a general hardware fault indication - circuit fault occurs. Correlates with Critical alarm circuitHardwareFault.                                                |
| xDSL600                                                  | ATUCs transmit rate has changed (RADSL mode only).                                                                                                                             |
| xDSL601                                                  | ATUC initialization failed.                                                                                                                                                    |
| xDSL602                                                  | ATURs transmit rate has changed (RADSL mode only).                                                                                                                             |
| xDSL800                                                  | Loss of Framing 15-minute interval threshold reached.                                                                                                                          |
| xDSL801                                                  | Loss of Signal 15-minute interval threshold reached.                                                                                                                           |
| xDSL802                                                  | Loss of Power 15-minute interval threshold reached.                                                                                                                            |
| xDSL803                                                  | Errored Second 15-minute interval threshold reached.                                                                                                                           |
| xDSL805                                                  | Loss of Framing 15-minute interval threshold reached.                                                                                                                          |
| xDSL806                                                  | Loss of Signal 15-minute interval threshold reached.                                                                                                                           |
| xDSL807                                                  | Loss of Power 15-minute interval threshold reached.                                                                                                                            |
| xDSL808                                                  | Errored Second 15-minute interval threshold reached.                                                                                                                           |
| xDSL809                                                  | A DSL Interface exceeds the specified threshold on a given performance measurement.                                                                                            |
| The following items describe the MG9K Clock Sync alarms. |                                                                                                                                                                                |
| Loss of Phase Lock                                       | Minor: Phase PLD [altera 7064b] detected a minimum phase difference greater than eight nano seconds.                                                                           |

**MG 9000 Faults available**

|                          |                                                                                                                                                                                                                                                                                                                                        |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Loss of Frame Pulse Lock | Minor: Frame pulse alignment did not get established with the active card -- it should occur in the inactive card only                                                                                                                                                                                                                 |
| Loss of My Clock         | Minor: The high and low levels of the SYNC PLL clock are not toggling.                                                                                                                                                                                                                                                                 |
| Loss of Mate Clock       | Minor: The high and Low levels of the mate clock are not toggling.                                                                                                                                                                                                                                                                     |
| Loss of Clock Output     | Major: Phase PLD reference clock oscillator not toggling.                                                                                                                                                                                                                                                                              |
| Single Reference Failure | Minor: Single monitored reference source has been lost.                                                                                                                                                                                                                                                                                |
| All Reference Failure    | Major: Absolute and Delta reference source signals have been lost.                                                                                                                                                                                                                                                                     |
| Single Sync Unit Failure | Major: Stratum 3 unit on ITP failed.                                                                                                                                                                                                                                                                                                   |
| Clock Stability          | Clock mode can be Acquiring, Acquired, Hold Over, or Free Run.                                                                                                                                                                                                                                                                         |
| DACV alarms              | DACV at Rail is a Major alarm to indicate the ITP clock circuitry has attempted to acquire sync and has traversed the frequency range to the extreme end of its capture range..<br><br>DACV Out of Range is a Major alarm to indicate that the ITP 's DACV clock circuitry is in an invalid condition and the values are out of range. |
| Signal LOS               | Minor: Single/All source reference occurred due to loss of signal.                                                                                                                                                                                                                                                                     |
| Signal LOF               | Minor: Single/All source(s) reference occurred due to out of frame.                                                                                                                                                                                                                                                                    |
| No Signal                | Minor: Sync source reference selected does not provide a signal.                                                                                                                                                                                                                                                                       |
| MG9K alarms              | Unable to communicate with RADIUS Server.<br><br>Secure link Down with GWC.<br><br>Packet Discard (depends on the threshold set).<br><br>Overload Controls--these alarms will now also apply to the ABI & ITP Card as well as the DCC Card.                                                                                            |
| MG9K Threshold logs      | SAD: Discard Policy, or Lookup failed.<br><br>IKE: Main mode failed, or Mismatched PSK, or Quick mode failed, or Proposal mismatch, or NULL ESP & authentication = null, or en/decryption failures, or Packet discarded, or decryption errors, or Auth errors.<br><br>IPSec Security: Decryption error or Authentication error.        |
| MG9K security alarms     | Non-responsive RADIUS Server<br><br>Expired Links to Security Peers<br><br>Replayed Packet threshold                                                                                                                                                                                                                                   |

**MG 9000 Faults available**

|                       |                                                                                                                                         |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|                       | Packet Discard threshold                                                                                                                |
| MG9K                  | IKE negotiation errors                                                                                                                  |
| security              | IP packet authentication failures                                                                                                       |
| events logs           | Packet discard                                                                                                                          |
|                       | Replayed packets                                                                                                                        |
| IPSec Syslog messages | There is a wide variety of IKE failure messages generated to syslog. Refer to feature A00005561 in this document for the complete list. |

**NPM--available logs/faults**

The following table lists the Network Patch Manager (NPM) Logs/Faults available.

NPM supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled "IEMS Functionality." For details on the logs, refer to the Fault section of the FCAPS documentation on CS 2000 Management Tools, NN10325-900 and NN10275-909, *Fault Management Log Reference*.

**NPM Logs/Faults available**

| Log/Fault                                     | Description                                                                                                                        |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: Network Patch Manager</b> |                                                                                                                                    |
| NPM360                                        | Reports that an alarm has been raised.                                                                                             |
| NPM370                                        | Reports when an alarm has been cleared.                                                                                            |
| NPM400                                        | Reports the results of attempted apply, remove, and audit commands.                                                                |
| NPM600                                        | Reports when the NPM server has been started, either by reboot or manually.                                                        |
| NPM601                                        | File failure; reports general problems that could be service affecting. The log contains lines of trouble information text.        |
| NPM603                                        | There are problems between the database and the device during a device audit.                                                      |
| NPM605                                        | General trouble log; reports general problems that could be service affecting. The log contains lines of trouble information text. |
| NPM610                                        | Provides information related to the execution of a task.                                                                           |
| NPM660                                        | Reports problems when a plan fails to execute.                                                                                     |
| NPM680                                        | Reports problems when a plan is automatically executed.                                                                            |
| <b>NPM System Alarms</b>                      |                                                                                                                                    |
| Alarm name                                    | Description                                                                                                                        |
| ACT_NOT_APP                                   | Activated patch not applied to all applicable devices.                                                                             |
| ACT_NOT_ACT                                   | Active patch applied to all applicable devices but not activated in all devices.                                                   |

**NPM Logs/Faults available**

| Log/Fault        | Description                                                                             |
|------------------|-----------------------------------------------------------------------------------------|
| DEBUG_APP        | Debug patches applied. Minor.                                                           |
| DISABLED_APPLIED | Applied patches that can be enabled, but are disabled. Major.                           |
| DNR_NOT_APP      | Do Not Remove (DNR) patches not applied. Critical.                                      |
| EMG_NOT_APP      | Emergency patches not applied. Critical.                                                |
| ENABLED_REMOVED  | Patches which can be enabled but are not enabled. Major.                                |
| GEN_NOT_APP      | General patches not applied. (No severity)                                              |
| LTD_NOT_APP      | Limited patches not applied. (No severity)                                              |
| OBS_NOT_REMOVED  | Obsolete patches not removed. Major.                                                    |
| OBE_NOT_REMOVED  | Obsolete emergency patches not removed. Critical.                                       |
| REMOVED_PATCHES  | Removed patches when are not category OBS, OBE, or DBG. (No severity)                   |
| PATCH_ONHOLD     | Patches on hold. Minor.                                                                 |
| DEVICE_ONHOLD    | Devices on hold. Minor.                                                                 |
| REL_GEN_NOT_APP  | A Major alarm raised when a released patch has not been applied. Relates to log NPM360. |
| PFRSGETPATCH     | A Major alarm raised when the PFRS GENREPORT task has failed. Relates to log NPM360.    |
| PFRSGENREPORT    | A Major alarm raised when the PFRS GETPATCH task has failed. Relates to log NPM360.     |

**CS2000 Core Manager--available logs/faults**

The following table lists the CS2000 Core Manager Logs/Faults available. The CS 2000 Core Manager supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the section in this document titled “IEMS Functionality.” For details on the faults themselves, refer to the Fault Management section of CS 2000 FCAPS documentation, NN10082-911 and NN10275-909, *Fault Management Log Reference*.

**CS2000 Core Manager Logs/Faults available**

| Log/Fault                                   | Description                                                           |
|---------------------------------------------|-----------------------------------------------------------------------|
| <b>Network Element: CS2000 Core Manager</b> | For details on previously existing Logs/Faults, refer to NN10082-911. |
| CBM upgrade log                             | The CBM upgrade log is generated for any CBM upgrade failure.         |
| SDM267                                      | Indicates a change in the condition of a CBM link                     |

**CS2000 Core Manager Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                                               |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDM300    | The connection from the CS2000 Core Manager to the CM or operating company LAN server(s) is down.                                                                                                                                                                                                                         |
| SDM301    | The maintenance system detects the logical volume mirroring status.                                                                                                                                                                                                                                                       |
| SDM302    | Use of a system resource exceeds the threshold. Associated with log SDM602.                                                                                                                                                                                                                                               |
| SDM303    | A process has failed more than 3 times in a day, or some other application fault has occurred. Reports an application alarm condition where action is required. Associated with log SDM603 which indicates a clearing of the alarm. CR Q00537118 and CR Q00600912 also impact this log for consistent formatting changes. |
| SDM304    | Log Delivery application has failed to reconnect to a device.                                                                                                                                                                                                                                                             |
| SDM305    | A problem exists with DTH commissioning. The log indicates which device and suggests a recommended action. Associated with a Minor alarm.                                                                                                                                                                                 |
| SDM306    | Table access software versions on the CM side and the SDM side are not compatible. Associated with a Minor alarm.                                                                                                                                                                                                         |
| SDM307    | Indicates trouble with the SDMCi. The connection to the CM was lost more than 3 times. Check the telnet port.                                                                                                                                                                                                             |
| SDM308    | An I-tape or S-tape backup has failed.                                                                                                                                                                                                                                                                                    |
| SDM309    | Fault detected on HW device or user took HW device OOS.                                                                                                                                                                                                                                                                   |
| SDM310    | System found a pending transaction at startup time. Check the audit log to find out which command was involved. Rollback of the transaction was successful. Use the SDMdbAdmin tool to sync CM and SDM again. Associated with a Minor alarm.                                                                              |
| SDM311    | System found a pending transaction at startup time. Check the audit log to find out which command was involved. Rollback of the transaction was NOT successful. Use the SDMdbAdmin tool to sync CM and SDM again. Associated with a Major alarm.                                                                          |
| SDM312    | Postprocessing of a command failed. The transaction was rolled back. Use the SDMdbAdmin tool to sync CM and SDM again. Associated with a Minor alarm.                                                                                                                                                                     |
| SDM313    | Postprocessing of a command failed. The transaction was rolled back. Use the SDMdbAdmin tool to sync CM and SDM again. Associated with a Major alarm.                                                                                                                                                                     |
| SDM314    | Indicates two SDM link connections are physically crossed. Associated with Major alarm "Crossed Link."                                                                                                                                                                                                                    |
| SDM315    | Corruption of file detected during data dictionary download.                                                                                                                                                                                                                                                              |
| SDM317    | DCE subsystem has detected a problem.                                                                                                                                                                                                                                                                                     |
| SDM318    | OM report failed to complete within one report interval. Associated with a Major alarm.                                                                                                                                                                                                                                   |
| SDM321    | Reports that a split-system upgrade is in progress. Associated with a Minor alarm.                                                                                                                                                                                                                                        |
| SDM325    | The connection to a network management component in a given domain has been lost. Log reports may be lost as a result.                                                                                                                                                                                                    |
| SDM328    | Indicates that the signal on receive/ transmit fibre to OC3 card is faulty or not present. Associated with Major alarm OC3 Card Fault.                                                                                                                                                                                    |

**CS2000 Core Manager Logs/Faults available**

| Log/Fault | Description                                                                                                                                                                                                                                                                                    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDM329    | Indicates a probable link equipment malfunction. Associated with Minor alarm Minor Link Fault.                                                                                                                                                                                                 |
| SDM332    | Indicates the status of an unsuccessful SDM system audit. An INFO log.                                                                                                                                                                                                                         |
| SDM336    | Indicates that a response to CBM 800 heartbeat is not received from the core. Associated with major alarm Core Heartbeat                                                                                                                                                                       |
| SDM337    | Indicates that the patch failed signature checking.                                                                                                                                                                                                                                            |
| SDM500    | The SDM node control process has restarted.                                                                                                                                                                                                                                                    |
| SDM501    | The node control process updated SDM run state to INSV.                                                                                                                                                                                                                                        |
| SDM502    | The node control process updated SDM run state to MANB. Logs SDM502-505 are included in the CS2000 Core Manager Log Delivery stream, but do not appear on the RMI.                                                                                                                             |
| SDM503    | The node control process updated SDM run state to SYSB.                                                                                                                                                                                                                                        |
| SDM504    | The node control process updated SDM run state to ISTB.                                                                                                                                                                                                                                        |
| SDM505    | The node control process updated SDM run state to OFFL from MANB.                                                                                                                                                                                                                              |
| SDM550    | An SDM Node Status Change has occurred. Modified in SN06 so that the log occurs in only one type of format and it no longer reports application state change events of OffL, ManB, and process starts.                                                                                         |
| SDM600    | An SDM maintenance connection has been re-established.                                                                                                                                                                                                                                         |
| SDM601    | Logical volume mirroring is re-established.                                                                                                                                                                                                                                                    |
| SDM602    | A system resource is below the threshold.                                                                                                                                                                                                                                                      |
| SDM603    | The SDM303 alarm has been cleared. Or a state change has occurred that does not require manual intervention to clear. With SN06, this log now reports application state change events of OffL, ManB, and process starts. CR Q00600912 also impacts this log for consistent formatting changes. |
| SDM604    | CM had too little time to format log(s) and log(s) is/are lost.                                                                                                                                                                                                                                |
| SDM607    | Internal CS 2000 Core Manager log; indicates when a process controller starts or restarts a process. The system does not send SDM607 to the OSS. You can see the SDM607 report from the remote maintenance interface (RMI), when logged onto the CS 2000 Core Manager.                         |
| SDM608    | I-tape or S-tape process has completed.                                                                                                                                                                                                                                                        |
| SDM609    | A hardware device has returned to the INSV state.                                                                                                                                                                                                                                              |
| SDM614    | Reports that the crossed link alarm associated with SDM314 is cleared.                                                                                                                                                                                                                         |
| SDM615    | Log Thresholding is in effect for logs managed by exception application. Exception reports may be inaccurate                                                                                                                                                                                   |
| SDM616    | An unauthorized connection attempt is detected by the Log Delivery application. The connection is refused.                                                                                                                                                                                     |
| SDM617    | A DCE problem has been cleared.                                                                                                                                                                                                                                                                |
| SDM618    | Logical volume /var is 98 percent full. Log files in /var/adm have been deleted.                                                                                                                                                                                                               |



**CS2000 Core Manager Logs/Faults available**

| Log/Fault                      | Description                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDM619                         | OM Access Service detected a corrupt OM group during an OM schema download.                                                                                                                                                                                                                                                                                                      |
| SDM620                         | Reports current system performance data at set times.                                                                                                                                                                                                                                                                                                                            |
| SDM621                         | The split-system upgrade is finished.                                                                                                                                                                                                                                                                                                                                            |
| SDM622                         | Max file size reached for a file device handled by GDD.                                                                                                                                                                                                                                                                                                                          |
| SDM625                         | The connection to a Network Management component in a given domain has been re-established.                                                                                                                                                                                                                                                                                      |
| SDM626                         | An info log generated whenever the OMDD application starts and it detects that the tuple number option has been changed since the last time the application was launched. The log is used to inform the OSS of the state change, which inherently signifies a change in the OMDD CSV files. The log will indicate the new (current) state as being either ACTIVATED or DISABLED. |
| SDM630                         | Indicates the SDM REX Test start and complete time. An INFO log.                                                                                                                                                                                                                                                                                                                 |
| SDM632                         | Indicates the status of a successful SDM system audit. An INFO log.                                                                                                                                                                                                                                                                                                              |
| SDM633                         | A CBM info log that indicates a change in the condition of a CBM link.                                                                                                                                                                                                                                                                                                           |
| SDM634                         | Indicates that the OC3 Card Fault alarm raised with SDM328 has been cleared.                                                                                                                                                                                                                                                                                                     |
| SDM635                         | Indicates that the Minor Link Fault alarm raised with SDM329 has been cleared.                                                                                                                                                                                                                                                                                                   |
| SDM636                         | Indicates that the heartbeat alarm raised with SDM336 has been cleared.                                                                                                                                                                                                                                                                                                          |
| SDM637                         | Indicates that patch check status is cleared by the user.                                                                                                                                                                                                                                                                                                                        |
| SDM650                         | Link maintenance requests a report on a failed link maintenance action.                                                                                                                                                                                                                                                                                                          |
| SDM700                         | Reports a Warm, Cold, or Reload restart or a norestartswact on the core.                                                                                                                                                                                                                                                                                                         |
| SDM739                         | Indicates file transfers between the FTP Client and the CORE and to show user log-ons to the CORE.                                                                                                                                                                                                                                                                               |
| <b>SDMB logs (SDM billing)</b> |                                                                                                                                                                                                                                                                                                                                                                                  |
| SDMB300                        | Memory allocation failed for SDM billing system.                                                                                                                                                                                                                                                                                                                                 |
| SDMB310                        | Indicates a communication problem with the SDM Billing System.                                                                                                                                                                                                                                                                                                                   |
| SDMB315                        | A software-related problem has occurred.                                                                                                                                                                                                                                                                                                                                         |
| SDMB316                        | A billing-related process has been manually killed.                                                                                                                                                                                                                                                                                                                              |
| SDMB320                        | A billing-backup problem affecting more than one file.                                                                                                                                                                                                                                                                                                                           |
| SDMB321                        | A billing-backup problem affecting one file.                                                                                                                                                                                                                                                                                                                                     |
| SDMB350                        | The billing application has reached a death threshold (a process has died > 3 times < 1 minute apart) and there is a request to restart.                                                                                                                                                                                                                                         |
| SDMB355                        | A disk-related problem has occurred, such as problems writing to disk (related to alarm DSKWR) or with disk utilization (related to alarm LODSK).                                                                                                                                                                                                                                |
| SDMB365                        | A new version of the billing application does not support a stream format on an active stream present in previous load.                                                                                                                                                                                                                                                          |
| SDMB367                        | Value has been set on a trappable MIB object.                                                                                                                                                                                                                                                                                                                                    |



**CS2000 Core Manager Logs/Faults available**

| Log/Fault             | Description                                                                                                                                                                                                                                            |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SDMB370               | CDR-to-BAF conversion encountered a problem that prevented it from converting CDR to BAF; BAF record lost.                                                                                                                                             |
| SDMB375               | Generated when a problem occurs during the transfer of a file to the data processing management system (DPMS). It may be problems and alarms related to FTP, RTB (real-time billing), AFT (automatic file transfer), or Secure File Transfer Protocol. |
| SDMB380               | The file transfer mode for the stream indicated has an invalid value.                                                                                                                                                                                  |
| SDMB390               | A schedule-related problem has occurred.                                                                                                                                                                                                               |
| SDMB400               | Generated every hour for every active stream to list all current active alarms.                                                                                                                                                                        |
| SDMB530               | The configuration or status of a stream has changed.                                                                                                                                                                                                   |
| SDMB531               | Configuration for backup volumes was changed correctly.                                                                                                                                                                                                |
| SDMB550               | The billing application has shut down.                                                                                                                                                                                                                 |
| SDMB600               | Generic information for the overall SDM Billing System.                                                                                                                                                                                                |
| SDMB610               | A communications-related problem has been resolved.                                                                                                                                                                                                    |
| SDMB620               | A backup-related problem has been resolved.                                                                                                                                                                                                            |
| SDMB621               | A new backup file is being started.                                                                                                                                                                                                                    |
| SDMB625               | Recovery has started on a backup file.                                                                                                                                                                                                                 |
| SDMB650               | The billing application is restarting one or more processes.                                                                                                                                                                                           |
| SDMB655               | Indicates file state changes and disk utilization, OR disk utilization has dropped below a threshold, OR the billing application cannot move a file to the closeSentProcessed directory.                                                               |
| SDMB665               | A software problem on the CM prevents the downloading (synch) of FLEXCDR data at the SDM.                                                                                                                                                              |
| SDMB675               | An information log that identifies a event related to the transfer of billing files. An event may be a normal operation, a problem, or the resolution of a problem related to SDMB375.                                                                 |
| SDMB680               | Information not related to the file system or creating links needs to be communicated to the customer.                                                                                                                                                 |
| SDMB690               | Indicates that an SBAIF alarm and the fault that caused it have cleared.                                                                                                                                                                               |
| SDMB691               | Generates when a problem occurs with the scheduled transfer of billing files and when that fault clears. It also generates when a file transfer schedule is manually deactivated or deleted.                                                           |
| SDMB820               | A backup has hit a threshold.                                                                                                                                                                                                                          |
| SDM security log      | An Authentication and Authorization Security Syslog, generated when a security event occurs on a SDM.                                                                                                                                                  |
| SDM patch check alarm | This minor alarm is generated under the "sdmmtc sys" level, raised upon a patch signature check failure.                                                                                                                                               |

## ERS8600 (formerly Passport 8600)--available traps/faults

ERS8600 (formerly Passport 8600) supports SCC2 format through the IEMS interface. For details on the IEMS interface, refer to the chapter in this document titled "IEMS Functionality." The following table lists the Passport 8600 traps available.

### ERS8600 (formerly Passport 8600) Traps available

| Trap Name                                                                                                                                                       | Description                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Network Element: ERS8600 (formerly Passport 8600)</b>                                                                                                        |                                                     |
| Faults from the ERS8600 (formerly Passport 8600) are provided via an SNMP Northbound interface that is provided on the ERS8600 (formerly Passport 8600) itself. |                                                     |
| risingAlarm                                                                                                                                                     | Minor, correlates with PP310.                       |
| fallingAlarm                                                                                                                                                    | Cleared, correlates with PP311.                     |
| Default Trap                                                                                                                                                    | Indeterminate, correlates with PP312.               |
| coldStart                                                                                                                                                       | Cleared, correlates with PP313.                     |
| warmStart                                                                                                                                                       | Cleared, correlates with PP315.                     |
| linkDown                                                                                                                                                        | Major, correlates with PP317.                       |
| linkUp                                                                                                                                                          | Cleared, correlates with PP318.                     |
| authenticationFailure                                                                                                                                           | Warning, correlates with PP319.                     |
| rcnChasPowerSupplyDown                                                                                                                                          | Critical, correlates with PP322.                    |
| rcnChasPowerSupplyUp                                                                                                                                            | Cleared, correlates with PP323.                     |
| rcnChasFanDown                                                                                                                                                  | Critical, correlates with PP324.                    |
| rcnChasFanUp                                                                                                                                                    | Cleared, correlates with PP325.                     |
| rcn2kCardDown                                                                                                                                                   | Major, correlates with PP326.                       |
| rcn2kCardUp                                                                                                                                                     | Cleared, correlates with PP327.                     |
| rcn2kTemperature                                                                                                                                                | Critical, correlates with PP328.                    |
| rcnErrorNotification                                                                                                                                            | Warning, Major, Critical, correlates with PP329.    |
| rcnLinkOscillation                                                                                                                                              | Major, correlates with PP330.                       |
| rcnMacViolation                                                                                                                                                 | Warning, correlates with PP331.                     |
| rcnSonetTrap                                                                                                                                                    | Warning, correlates with PP332.                     |
| rcnStpNewRoot                                                                                                                                                   | Warning, correlates with PP333.                     |
| rcnStpTopologyChange                                                                                                                                            | Warning, correlates with PP334.                     |
| rcnStpTCN                                                                                                                                                       | Warning, correlates with PP335.                     |
| rcn2kAtmPvcLinkStateChange                                                                                                                                      | Indeterminate, Minor, Major, correlates with PP336. |
| rcnSmltIstLinkUp                                                                                                                                                | Cleared correlates with PP337.                      |
| rcnSmltIstLinkDown                                                                                                                                              | Major, correlates with PP338.                       |
| rcnSmltLinkUp                                                                                                                                                   | Cleared, correlates with PP339.                     |

**ERS8600 (formerly Passport 8600) Traps available**

| Trap Name                | Description                              |
|--------------------------|------------------------------------------|
| rcnSmltLinkDown          | Major, correlates with PP340.            |
| rcnPasswordChange        | Warning, correlates with PP341.          |
| rcnPcmciaCardRemoved     | Warning, correlates with PP342.          |
| rcnSmartCpldTimerFired   | Major, correlates with PP343.            |
| rcnCardCpldNotUpDate     | Warning, correlates with PP344.          |
| rcnIgapLogFileFull       | Major, correlates with PP345.            |
| rcnCpLimitShutDown       | Major, correlates with PP346.            |
| rcnSshServerEnabled      | Cleared, correlates with PP347.          |
| rcnSshServerDisabled     | Major, correlates with PP348.            |
| rcnSshSessionLogin       | Cleared, correlates with PP349.          |
| rcnSshSessionLogout      | Major, correlates with PP350.            |
| rcnSshUnauthorizedAccess | Major, correlates with PP351.            |
| rcnHaCpuState            | Warning, correlates with PP352.          |
| rcnInsufficientMemory    | Warning, correlates with PP353.          |
| rcnSaveConfigAction      | Minor, correlates with PP354.            |
| rcnLoopDetectOnPort      | Warning correlates with PP355.           |
| vrrpTrapStateTransition  | Warning, correlates with PP356.          |
| rcnEmError               | Warning, correlates with PP357.          |
| ospfVirtIfStateChange    | Warning, Cleared, correlates with PP358. |
| ospfNbrStateChange       | Warning, Cleared, correlates with PP359. |
| ospfVirtNbrStateChange   | Minor, Cleared, correlates with PP360.   |
| ospfIfConfigError        | Major, correlates with PP361.            |
| ospfVirtIfConfigError    | Major, correlates with PP362.            |
| ospfIfAuthFailure        | Major, correlates with PP363.            |
| ospfVirtIfAuthFailure    | Major, correlates with PP364.            |
| ospfIfStateChange        | Warning, Cleared, correlates with PP365. |
| rcnCardDown              | Major, correlates with PP366.            |
| rcnCardUp                | Cleared, correlates with PP367.          |
| rcnbgpEstablished        | Cleared, correlates with PP368.          |
| rcnbgpBackwardTransition | Cleared, correlates with PP369.          |
| rcnAggLinkUp             | Cleared, correlates with PP370.          |
| rcnAggLinkDown           | Cleared, correlates with PP371.          |
| rcnIcmpNewGroupMember    | Cleared, correlates with PP372.          |
| rcnIcmpLossGroupMember   | Cleared, correlates with PP373.          |
| rcnIcmpNewQuerier        | Cleared, correlates with PP374.          |
| rcnIcmpQuerierChange     | Cleared, correlates with PP375.          |

**ERS8600 (formerly Passport 8600) Traps available**

| Trap Name                                                          | Description                                                                                                                                                                             |
|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| rcnDvmrpIfStateChange                                              | Cleared, correlates with PP376                                                                                                                                                          |
| rcnDvmrpNewNbrChange                                               | Cleared, correlates with PP377.                                                                                                                                                         |
| rcnDvmrpNbrLossChange                                              | Cleared, correlates with PP378.                                                                                                                                                         |
| rcnFdbProtectViolation                                             | Cleared, correlates with PP379.                                                                                                                                                         |
| rcnLogMsgControl                                                   | Cleared, correlates with PP380.                                                                                                                                                         |
| rcnSaveConfigFile                                                  | Cleared, correlates with PP381.                                                                                                                                                         |
| rcnDNSRequestResponse                                              | Cleared, correlates with PP382.                                                                                                                                                         |
| pingProbeFailed                                                    | Cleared, correlates with PP383.                                                                                                                                                         |
| pingTestFailed                                                     | Cleared, correlates with PP384.                                                                                                                                                         |
| pingTestCompleted                                                  | Cleared, correlates with PP385.                                                                                                                                                         |
| traceRoutePathChange                                               | Cleared, correlates with PP386.                                                                                                                                                         |
| traceRouteTestFailed                                               | Cleared, correlates with PP387.                                                                                                                                                         |
| traceRouteTestComplete                                             | Cleared, correlates with PP388.                                                                                                                                                         |
| UDPEapSessionEndTrap                                               | Cleared, correlates with PP389.                                                                                                                                                         |
| UDPEapSessionStartTrap                                             | Cleared, correlates with PP390.                                                                                                                                                         |
| Trap raised by<br>idi_PP8600.pol to indicate<br>Device-Rediscovery | This trap indicates that a device re-discovery has been initiated.                                                                                                                      |
| OSPF v2 trap                                                       | This trap indicates a variable ospfAddressLessIf (var(2)) takes the value 0 on interfaces with IP addresses and the corresponding value of ifIndex for interfaces having no IP address. |

See the design description of feature A00002920, which supports and generates ERS8600 (formerly Passport 8600) logs that are received by the PLS application. The design description of this feature is in the Feature Deltas section of the SN06.2 OSS Guide.

**MG15000 (previously PVG) Logs/Faults**

For Logs/Faults available for MG15000 (previously PVG), refer to NTP NN10600-500 *Nortel Networks Multiservice Switch 6400/7400/15000/20000 Alarms Reference*

**Multiservice Data Manager logs/faults**

For logs and faults information for the Multiservice Data Manager (MDM), refer to the following documents: 241-6001-501, *MDM Proxy Alarms Reference Guide*, and 241-6001-011, *MDM Advisor User Guide*.

## QCA Logs/Faults

The following table lists the QCA Faults/Alarms available. QCA supports SCC2 or NT STD formatted logs through SDM functionality, or it can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled “IEMS Functionality.” For details on the logs, refer to the Fault section of the FCAPS documentation on CS 2000, NN10083-911 and NN10275-909, *Fault Management Log Reference*.

### QCA Logs/Faults

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QCA201    | Warning. Qca.properties not available at QCA start-up, or other problems related to properties/qca.properties.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| QCA202    | No priority. Old file retention directory (today-x) is being removed, OR file found in active directory when QCA started.                                                                                                                                                                                                                                                                                                                                                                                                                |
| QCA203    | QCA cannot be stopped. The qca.properties file may be missing, the system cannot determine the QCA port number.                                                                                                                                                                                                                                                                                                                                                                                                                          |
| QCA300    | No priority. File handler or server socket could not be started.                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| QCA301    | Minor or Major. Minor: QoS Record received with Unsupported Length or Unsupported Version. Major: 10 sequential QoS Records received with Unsupported Length or Version.                                                                                                                                                                                                                                                                                                                                                                 |
| QCA302    | No priority. Out of sequence QoS record received, OR problem processing binary QoS record.                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| QCA305    | No priority. Connection to client is closed. In SN08, priority is changed to None, and reason for generation is changed to when the connection to client is closed.                                                                                                                                                                                                                                                                                                                                                                      |
| QCA310    | Minor, Major, or Critical. Minor: disk space is below the minimum threshold. Major: Disk space is below 500Mb. Critical: disk space is below 100 Mb.                                                                                                                                                                                                                                                                                                                                                                                     |
| QCA315    | No priority, or Warning. Generated for one of many possible file writing or file access problems. For the Warning level, it means that a request to get a new file name has failed, or the QCA has failed to write the footer information to the active file while attempting to close. Other reasons, for example, might be: could not get new file to write records; file <fileName> is corrupted or removed; could not write to the activefile; active file exists but cannot write records to it. In some cases, QCA will shut down. |
| QCA322    | No priority. New GWC connection received.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| QCA399    | No priority. Clear log for QCA301 or QCA310.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## RTP Media Portal Logs/Faults

The following table lists the RTP Media Portal Faults/Alarms available. RTP Media Portal can be supported through IEMS. For details on the IEMS interface, refer to the chapter in this document titled “IEMS Functionality.”

For details on the logs, refer to NN10383-900, *Fault Management Alarm and Log Reference* and NN10035-111, *MCS5200 RTP Media Portal Basics*.

#### RTP Media Portal Logs/Faults

| Log/Fault | Description                                                                                                                                                                                                                                                                                                                                                        |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RTP101    | Critical. Raised from alarm "Blade Out of Service." Occurs when Managed IP or MCP Service network difficulties (communication problems) are encountered when attempting to communicate with the Media Blade specified by BladeName.                                                                                                                                |
| RTP102    | Critical or Major. Raised from alarm "RTP Media Portal Out of Service." Occurs when timer activated event checks availability of Media Blades that are currently configured or when a OutOfServiceAlarm is raised.                                                                                                                                                 |
| RTP103    | Critical. Raised from alarm "Best Blade Selection." Occurs during session setup when the host attempts to determine which media blade should handle the session.                                                                                                                                                                                                   |
| RTP104    | Critical, Major, or Minor. Raised from alarm "Port Usage." Occurs when timer activated event checks to see what percentage of the configured Managed IP Network ports are in use. Alarm severity is based on the percentages configured for the parameters: "Minor Port Usage Alarm Level," "Major Port Usage Alarm Level," and "Critical Port Usage Alarm Level." |
| RTP105    | Major. Raised from alarm "Host Interface Failure." Occurs when a timer activated event checks the status of host network interfaces.                                                                                                                                                                                                                               |

#### UAS--available logs/faults

UAS faults are sent from the UAS to the UAS EM and are then sent northbound via CORBA. UAS alarm information can also be viewed from the alarm browser that resides with the CS2000 Management Tools. For details on the CORBA protocol/format and the logs, refer to the Fault Management section of UAS FCAPS documentation, NN10073-911 and NN10275-909, *Fault Management Log Reference*.

Refer to the New and Changed section of this document to see if there are SN08 changes in UAS logs and faults.

#### UAS Logs/Faults available

| Network Element: UAS                                                                                                                                                                                  |             |                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------------------------------------------------------------|
| UAS faults are sent from the UAS to the UAS EM and are then sent northbound via CORBA. UAS alarm information can also be viewed from the alarm browser that resides with the CS2000 Management Tools. |             |                                                                                                     |
| Fault                                                                                                                                                                                                 | Description | For details on these Logs/Faults, refer to the Fault section of documentation for UAS, NN10073-911. |
| ATM Alarms                                                                                                                                                                                            | AS001       | An ATM interface card is missing from the slot.                                                     |
|                                                                                                                                                                                                       | AS002       | There is a different ATM card module inserted in the chassis slot.                                  |
|                                                                                                                                                                                                       | AS003       | The ATM card has detected an H.110 bus failure.                                                     |
|                                                                                                                                                                                                       | AP001       | The ATM interface port has had a loss of connectivity.                                              |

**UAS Logs/Faults available****Ethernet Interface Alarms**

EI\_LINK\_DOWN; Critical. "Callp was unable to initialize interface to hardware. Check configuration." Clear with a reboot.

88065 EI\_LINK\_DOWN; Critical. "Link on host network interface is down."  
(366)

**Call Agent Connection Alarms**

8193 (301) THREAD\_DEATH\_ALARM; Critical. Either the "incoming" or "outgoing" messaging thread is unable to restart because of some undetermined problem. Clears at the next startup of call processing application.

8194 (302) UDP\_INIT\_FAIL\_ALARM; Critical. This alarm can be raised for various reasons during initialization. The audio server is unable to communicate with the call server. The condition clears at the next startup of the call processing application. Possible reasons and corrective actions follow:

MGC IP address is not datafilled because the uas.conf file either does not exist, is unreadable, or is missing an entry for "CallAgentIPAddress." Fix the configuration file.

MGC IP address is not valid because the call agent IP address obtained from the config file is not valid. Fix the IP address in the config file.

Bad return code from WSASStartup because an attempt was made to initialize the Windows socket library, but failed due to a version mismatch. Report the full text of the alarm to the support group.

WinSock version is not 1.1 as expected because an attempt was made to initialize the Windows socket library, but failed due to a version mismatch. Report the full text of the alarm to the support group.

Unable to create socket; an attempt was made to create a UDP communications socket, but failed. Report the full text of the alarm to the support group.

Unable to bind client name to socket; an attempt was made to bind the communications socket to the port specified in the uas.conf configuration file. Another callp program may already be running. Make sure that another callp program is not running.

Unable to connect to call agent socket; an attempt was made to associate the communications socket with the address of the call agent, but failed. Report the full text of the alarm to the support group.

8195 (800) SOCKET\_ERROR\_ALARM; Warning. UDP Socket errors are being detected.

8196 (801) RETRANS\_ALARM Warning, Retransmissions are being detected.

8197 (802) EXCEED\_MAX\_RETRANS\_ALARM; Warning, Call\_Agent\_Connection, The number of retransmissions has now exceeded the maximum number of retransmissions.

**System Alarms**

6154 (379) NODE\_NO\_CARDS\_INSTALLED; Critical. "There are no NMS cards installed."

**Call Engine Alarms** -- associated with call processing or maintenance state machines.



**UAS Logs/Faults available**

- 12290 (303) CALLP\_THREAD\_NOT\_RESTARTED; Major. The call processing software thread associated with <endpointId> died due to an unhandled software error, and was not restarted because it died too quickly after the previous start. Escalate this issue to Nortel support, providing any other logs that might have occurred. Clears at the next startup of the call processing application.
- 12291 (304) CALLP\_CFG\_INVALID; Critical. The resource configuration for endpointId in C:\uas\etc\rm.resources is not valid. Correct the configuration for endpointId in the rm.resources file, and restart the call processing application. Clears at the next startup of the call processing application.
- 12295 (305) AUDIO\_VFSDIR\_NOT\_SET; Critical. The environment variable VFSDIR is not set to the home directory of the VFS hierarchy. Verify that the VFS software is correctly installed. Clears at the next startup of the call processing application.
- 12296 (306) CALLP\_CONFIG\_PROB; Critical. A serious configuration problem has been detected. The Audio Server is unable to initialize. A configuration file is probably in error. Look for an error log to determine the exact cause of the problem. Clears at the next startup of the call processing application.
- 12297 (307) CALLP\_NO\_CARDS\_AVAILABLE Call\_Engine There are no NMS cards available for use.
- 12298 (308) CALLP\_AUDIO\_RESYNC\_FAILURE Call\_Engine Failed to communicate with aliasServer. Check audio installation and aliasServer.

**AG4000 Service-level Alarms** -- conditions that affect the service-level functionality of the AG4000 card in an ATM system.

- 14337 (315) AG\_GENERIC\_ALARM; Major. An attempt was made to load software onto the card and to start the card but failed. Stop the applications, reseal the card and then restart the applications. If the problem persists, contact the Nortel support group. Clears when the applications are restarted and the operation succeeds.
- 14338 (315) AG\_SURPRISE\_EXTRACTION Improper extraction of AG4000 card in slot <x> of the SAM 16 chassis.
- 14339 (316) AG\_CARD\_DISABLED AG4000 card in slot <x> disabled until next application restart of the UAS.

**NodeMtc Alarms** -- generated by the callp application if the NMS CT daemon and NMS Clock Fallback Manager services fail to stop or start successfully.

- 20481 (322) CTDAEMON\_SERVICE\_FAILURE; Critical. Either the NMS CT daemon service is not installed as a service, or it is in a service state where it cannot accept start and stop service requests. Make sure that the NMS CT daemon service is installed. Stop, uninstall and re-install the service if need be. Clears once the NMS CT daemon service has been successfully started or stopped.



**UAS Logs/Faults available**

20482 (323) CFBM\_SERVICE\_FAILURE; Critical. When the NMS CT daemon service is started, it should automatically start the NMS Clock Fallback Manager service (The NMS Clock Fallback Manager service is not automatically stopping the NMS CT daemon service.). If the NMS Clock Fallback Manager service is not automatically started for some reason, either the NMS Clock Fallback Manager service is not installed as a service for it to be started or stopped, or it is in a service state where it cannot accept start and stop service requests. Make sure that the NMS Clock Fallback Manager service is installed. Stop, uninstall and re-install the service if need be. Clears once the NMS Clock Fallback Manager service has been successfully started or stopped.

20483 (324) SERVICE\_FAILURE NodeMtc The <x> service could not be \_\_\_\_\_.

**ConfigMgr Alarms**

26625 CM\_CONFIG\_ERROR; Critical. This alarm can be raised for various reasons during initialization. A serious configuration problem has been detected. The Audio Server is unable to initialize. A configuration file is probably in error. Look for an error log to determine the exact cause of the problem. The condition clears after the configuration problem is fixed. Possible reasons and corrective actions follow:

The specified configuration template files are missing from c:\uas\cfg\templates. Restore the missing files.

The specified configuration file is missing. Restore the missing file.

ConfigMgr was unable to update the uas\_pending.conf file. The file may have had incorrect permissions, or the disk is full. Check file permissions. Check to see if the disk is full.

ConfigMgr attempted to create a kernel object but encountered an error. Contact the support group.

ConfigMgr was unable to copy a file. The file may have had incorrect permissions, or the disk is full. Look at logs to determine which file caused the problem. Check file permissions. Check to see if the disk is full.

ConfigMgr could not automatically determine how many AG cards there are in the system. The number of AG cards could not be determined. Ensure that the NMS locate utility is present and is working properly.

ConfigMgr could not update the uas.conf file with the number of AG cards. Check file permissions. Check to see if the disk is full.

A configuration parameter is missing or has an invalid value. Look at logs to determine which configuration parameters are missing.

ConfigMgr attempted to operate on a kernel object but encountered an error. Contact the support group.

**CG6000 Service-level Alarms**

**UAS Logs/Faults available**

|                |                                                                                                                                                                                                                                                                                                                                    |
|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 30721          | CG_GENERIC_ALARM; Major. An attempt was made to load software onto the card and to start the card. The attempt failed. Stop the applications, reseal the card and then restart the applications. If the problem persists, contact the Nortel support group. Clears when the applications are restarted and the operation succeeds. |
| 30722<br>(318) | CG_ETHERNET_CONN_ALARM Critical, CG6000%d failed ethernet connection(s) on CG6000 card in slot%d.                                                                                                                                                                                                                                  |
| 30723<br>(319) | CG_SURPRISE_EXTRACTION Major, CG6000 Improper extraction of CG6000 card in slot%d.                                                                                                                                                                                                                                                 |
| 30724<br>(320) | CG_CARD_DISABLED Major, CG6000 card in slot%d disabled until next application restart.                                                                                                                                                                                                                                             |
| 30725<br>(321) | CG_CLOCKING_ALARM Major, CG6000 primary clock source is%s and secondary clock source is%s in slot%d.                                                                                                                                                                                                                               |

**ATM Service Alarms**--The ATM\_MISSING\_CARD alarm and ATM\_MISMATCH\_CARD alarm are raised in situations where provisioned VCs exist for a given ATM Card in a given slot, and that card has either been removed, is inoperable, or has been replaced with another ATM card.

|       |                                                                                                                                                                                                                                                                                                                                                                     |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 34817 | ATM_MISSING_CARD; Critical. Either the ATM card has been pulled or it has experienced a catastrophic failure and is unable to register with the cPCI chassis. A working ATM card must be inserted into the slot. Alternatively, all the VCs may be deleted which are associated with the missing card. Clears at the next start of the call processing application. |
| 34818 | ATM_MISMATCH_CARD; Critical. The ATM card has been replaced with a different model ATM card. Place the correct ATM card back in the slot which originally contained the S007 card. Alternatively, all the VCs may be deleted which are associated with the mismatched card. Clears at the next start of the call processing application.                            |

**ATM Port Alarms**

|                |                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 34913          | ATM_PORT_LOC; Critical. The fiber connecting the ATM port to the network has either been unplugged or damaged. Plug the fiber back in, or replace it if it was damaged. Clears when the signal on the fiber is back to normal.                                                                                                                                                                                                                               |
| 34819<br>(328) | ATM_H110_FAILURE Critical ATM_Service The ATM card detected an H.110 bus failure. This alarm may be caused by a bad AG driving the H.110 bus clock or more than one card is trying to drive the clock on the bus. Clears at the next start of the call processing application.                                                                                                                                                                               |
| 34820<br>(329) | ATM_OUTDATED_FIRMWARE Major ATM_Service The ATM card in slot %d has outdated firmware ver.:%s recommended version:%s. Please run the ATMFirmware command to upgrade the firmware. This alarm is seen if the ATM card has outdated firmware. Clears at the next start of the call processing application, after the firmware has been upgraded.                                                                                                               |
| 34821<br>(330) | ATM_FIRMWARE_NON_UPGRADABLE Major ATM_Service The ATM card in slot %d has outdated firmware ver.:%s. This firmware needs to be manually updated. Please load the card with a firmware version which is 2.1.0 or later. This alarm is seen when the firmware on the ATM card is outdated and can not be automatically upgraded. A newer firmware load needs to be transfer to the card manually. Clears at the next start of the call processing application. |

**UAS Logs/Faults available**

34822 (331) ATM\_HW\_API\_TOO\_MANY\_FAILURES Critical ATM\_Service The number of consecutive API calls failures to the ATM card in slot %d, has exceeded the threshold of %d. The card is being taken out of service. Clears at the next start of the call processing application.

**Carrier Alarms**

40961 CARRIER\_CLR\_ALARM. Indicates that a carrier alarm cleared.

40962 CARRIER\_RAISE\_ALARM; Critical. One of these carrier alarms is raised: RAI, AIS, LOF, LOS, E1 LOMFS, or E1 16 AIS. Based on the different alarm types, check T1/E1 carrier for the cause. Clears when the CARRIER\_CLR\_ALARM event is received.

**Activity Manager Alarms**

53249 (336) AM\_COLD\_START\_NOT\_SENT\_CEM Activity\_Manager.

53250 (337) AM\_COLD\_START\_NOT\_SENT\_SWACT Activity\_Manager.

53251 (338) AM\_SWACT\_FAILURE Critical Activity\_Manager.

53252 (339) AM\_ERM\_FAILURE Critical Activity\_Manager.

53253 (340) AM\_ED\_SOCK\_FAILURE Major Activity\_Manager.

53254 (341) AM\_CONFIG\_ERROR\_NOFILE Minor Activity\_Manager.

53255 (342) AM\_DATAFILE\_ERROR\_NOFILE Critical Activity\_Manager.

**Power Supply, Disk, and Fan Maintenance Alarms**

61441 (345) COOLING\_SYSTEM\_RAISE\_ALARM; Major/Critical. In the case of a cooling fault, this is due to a high temperature at air intake to the chassis. In the case of a Cooling alarm, it is due to an extremely high temperature at air intake to the chassis. Check air flow and cooling equipment. Clears upon receipt of a GlobalServer Equipment fault tag with a 'cleared' alarm condition.

59393 (344) POWER\_SUPPLY\_RAISE\_ALARM; Major. HA Monitor received a Power Supply Fault Tag, and informed the PsFanMtc subsystem. This could be due to a faulty power supply system in the chassis that has gone down. Clears upon receipt of a Power Supply Fault tag with the "Power Good" bit set.

59393 POWER\_SUPPLY\_RAISE\_ALARM; Major. HA Monitor received a Fan Fault Tag, and informed the PsFanMtc subsystem. This could be due to a faulty fan in the chassis that has gone down. Clears upon receipt of a Fan Fault tag with the "Fan Fault" bit unset.

63489 (346) DISKDRIVE\_RAISE\_ALARM Critical Hard\_Disk ALARM: Problem detected on Domain %s %s disk drive, chassis peripheral %d, due to %s.

**I/O Card Base-level Alarms**

65537 (309) CD\_SURPRISE\_SLOT\_POWER\_OFF; Major. A surprise power off on a slot can be caused by a chassis hardware problem or by a software error. The problem may clear up after a reboot. Stop the applications and perform a reboot. If the problem does not clear up, then you may be able to workaround the problem by moving the card to another slot. Refer to the appropriate card maintenance and configuration procedures. The alarm clears when power is restored to the slot.

**UAS Logs/Faults available**

- 65538 (310) CD\_SURPRISE\_CARD\_EXTRACTION; Major. A card was improperly extracted from the specified slot. The applications will need to be restarted. Perform these actions: 1) stop the applications 2) reinsert the card 3) restart the applications. The alarm clears when the card is reinserted and the applications are restarted.
- 65539 (311) CD\_LOAD\_SCRIPT\_FAILURE; Major. An attempt was made to load firmware onto the card in the specified slot. Stop the applications, reseal the card, and restart the applications. If the problem persists, then contact the Nortel support group. If resealing the card fixes the problem, then the alarm will clear when the applications are restarted.
- 65540 (312) CD\_SLOT\_VERIFY\_SCRIPT\_FAILURE; Major. An attempt was made to verify that the card contains the correct firmware version. Stop the applications, reseal the card, and restart the applications. If the problem persists, then contact the Nortel support group. If resealing the card fixes the problem, then the alarm will clear when the applications are restarted.
- 65541 (313) CD\_GENERIC\_CARD\_ALARM; Major. A problem occurred with the card in the specified slot. A brief description of the problem is supplied. No action required; no clear condition.

**Shelf Controller Alarms**

- 67585 (309) SC\_SURPRISE\_SLOT\_POWER\_OFF Major Shelf Controller Surprise power off on slot %d.
- 67586 (310) SC\_SURPRISE\_CARD\_EXTRACTION Major Shelf Controller Surprise card extraction on.
- 67587 (311) SC\_LOAD\_SCRIPT\_FAILURE Major Shelf Controller Firmware load script failure on card in slot %d.
- 67588 (312) SC\_SLOT\_VERIFY\_SCRIPT\_FAILURE Major Shelf Controller Verify script failure on card in slot %d.
- 67589 (313) SC\_GENERIC\_CARD\_ALARM Major Shelf Controller Problem with card in slot %d:

**Hot Swap Controller Alarms**

- 69633 (309) HS\_SURPRISE\_SLOT\_POWER\_OFF Major Hot Swap Controller Surprise power off on slot %d.
- 69634 (310) HS\_SURPRISE\_CARD\_EXTRACTION Major Hot Swap Controller Surprise card extraction on slot %d.
- 69635 (311) HS\_LOAD\_SCRIPT\_FAILURE Major Hot Swap Controller Firmware load script failure on card in slot %d.
- 69636 (312) HS\_SLOT\_VERIFY\_SCRIPT\_FAILURE Major Hot Swap Controller Verify script failure on card in slot %d.
- 69637 (313) HS\_GENERIC\_CARD\_ALARM Major Hot Swap Controller Problem with card in slot %d:

**SCSI Controller Base-level Alarms**

**UAS Logs/Faults available**

- 71681 (309) SS\_SURPRISE\_SLOT\_POWER\_OFF; Major. A surprise power off on a slot can be caused by a chassis hardware problem or by a software error. The problem may clear up after a reboot. Stop the applications and perform a reboot. If the problem does not clear up, then you may be able to workaround the problem by moving the card to another slot. Refer to the appropriate card maintenance and configuration procedures. The alarm clears when power is restored to the slot.
- 71682 (310) SS\_SURPRISE\_CARD\_EXTRACTION; Major. A card was improperly extracted from the specified slot. The applications will need to be restarted. Perform these actions: 1) stop the applications 2) reinsert the card 3) restart the applications. The alarm clears when the card is reinserted and the applications are restarted.
- 71683 (311) SS\_LOAD\_SCRIPT\_FAILURE Major SCSI\_Controller Firmware load script failure on card in slot %d.
- 71684 (312) SS\_SLOT\_VERIFY\_SCRIPT\_FAILURE Major SCSI\_Controller Verify script failure on card in slot %d.
- 71685 (313) SS\_GENERIC\_CARD\_ALARM Major SCSI\_Controller Problem with card in slot %d:

**Chassis Even Manager Alarms**

- 75783 (311) SS\_LOAD\_SCRIPT\_FAILURE Major SCSI\_Controller Firmware load script failure on card in slot %d.
- 75784 (312) SS\_SLOT\_VERIFY\_SCRIPT\_FAILURE Major SCSI\_Controller Verify script failure on card in slot %d.
- 75785 (313) SS\_GENERIC\_CARD\_ALARM Major SCSI\_Controller Problem with card in slot %d:

**Local Resource Manager Alarms**

- 81921 (350) LRM\_CPU\_C Critical, LocalResourceManager cpu\_overload\_critical, The CPU is overloaded, critical alarm.
- 81922 (351) LRM\_CPU\_M Major, LocalResourceManager cpu\_overload\_major, The CPU is overloaded major alarm.
- 81923 (352) LRM\_MEM\_C Critical, LocalResourceManager, mem\_usage\_high\_critical, Memory usage is high.
- 81924 (353) LRM\_MEM\_M Major, LocalResourceManager mem\_usage\_high\_major, Memory usage is high
- 81925 (354) LRM\_DISK\_C Critical, LocalResourceManager disk\_usage\_critical, Disk usage is high.
- 81926 (355) LRM\_DISK\_M Major, LocalResourceManager disk\_usage\_major, Disk usage is high but less severe than critical where space is exhausted.
- 81927 (356) LRM\_CONFIG\_FILE\_ERR Minor, LocalResourceManager, lrm\_config\_fileerror

**Program Manager Alarms**

- 83971 (357) c\_FAILED\_MALLOC Critical ProgramManager.
- 83974 (358) c\_BAD\_PARSE Critical ProgramManager.
- 83987 (359) c\_BAD\_FORK Critical ProgramManager.

**UAS Logs/Faults available**

83989 (360) c\_BAD\_EXEC Critical ProgramManager.  
 83998 (361) c\_CRIT\_DEATH Critical ProgramManager.  
 83999 (362) c\_MAX\_RETRIES Critical ProgramManager  
 84000 (363) c\_MAX\_RETRIES\_NO\_RESTART Minor ProgramManager.  
 84009 (364) c\_FIFO\_ERROR Critical ProgramManager.  
 84039 (365) c\_RSM\_FAILED\_CONNECT Critical ProgramManager.

**Clock Manager Alarms**

90113 (367) PRIMARY\_CLOCK\_DOWN\_ALARM Minor ClockManager Primary Clock Driver trunk %d on board %d is down.  
 90114 (368) SECONDARY\_CLOCK\_DOWN\_ALARM Minor ClockManager Secondary Clock Driver trunk %d on board %d is down.  
 90115 (369) BOTH\_CLOCK\_DOWN\_ALARM Critical ClockManager System has lost all external clocking.  
 90116 (370) PRIMARY\_BOARD\_CLOCK\_DOWN\_ALARM Minor ClockManager Board %d has lost its primary clock source.  
 90117 (371) SECONDARY\_BOARD\_CLOCK\_DOWN\_ALARM Minor ClockManager Board %d has lost its secondary clock source.  
 90118 (372) BOTH\_BOARD\_CLOCK\_DOWN\_ALARM Critical ClockManager Board %d has lost all external clocking.

**Event Server Alarms**

96257 (373) LOCAL\_SRVSOCK\_CREATION\_FAILED Critical EventServer [es\_alm\_001] %s.  
 96258 (374) REMOTE\_SRVSOCK\_CREATION\_FAILED Major, EventServer [es\_alarm\_002] %s.  
 96259 (375) SYSTEM\_RESOURCE\_ERR Critical, EventServer [es\_alm\_003].  
 96260 (376) CONFIG\_ERR EventServer [es\_alm\_004].  
 96261 (377) HAMODE\_CHECK\_FAILED Critical, EventServer [es\_alm\_005].  
 96262 (378) MATE\_EVTSVR\_CONN\_LOST Minor, EventServer [es\_alarm\_006].

**UAS Logs**

|          |        |                                                                                              |
|----------|--------|----------------------------------------------------------------------------------------------|
| ATM logs | ASL001 | General ATM log indicating an ATM interface card problem.                                    |
|          | ASL002 | The ATM service has initialized successfully.                                                |
|          | ASL003 | An ATM delete gateway request has failed.                                                    |
|          | ASL004 | An ATM delete gateway request has failed.                                                    |
|          | ASL005 | An ATM interface card port has failed to lock. The port has returned to its previous state.  |
|          | ASL006 | An ATM interface card port has failed to lock. The port cannot return to its previous state. |

**UAS Logs/Faults available**

|        |                                                                                                                  |
|--------|------------------------------------------------------------------------------------------------------------------|
| ASL007 | An ATM Virtual Channel has experienced an AIS alarm.                                                             |
| ASL008 | An ATM Virtual Channel has experienced an RDI alarm.                                                             |
| ASL009 | An ATM Virtual Channel cleared the AIS alarm.                                                                    |
| ASL010 | An ATM Virtual Channel cleared the RDI alarm.                                                                    |
| ASL013 | The ATM port is configured with the wrong UNI version.                                                           |
| ASL014 | ILMI failure on the ATM port.                                                                                    |
| ASL015 | UNI failure on the ATM port.                                                                                     |
| ASL016 | ILMI is now ready on the ATM port.                                                                               |
| ASL017 | UNI is now ready on the ATM port.                                                                                |
| ASL018 | Invalid ATM SDP parameter received.                                                                              |
| ASL019 | Invalid VCCI received in the incoming AAL2 SVC setup.                                                            |
| ASL020 | A specific ATM software error occurred as described in the log.                                                  |
| ASL021 | Failed to acquire a channel for the endpoint described in the log.                                               |
| ASL022 | An error was reported by the NMS PA200 API.                                                                      |
| ASL023 | ATM audit has started.                                                                                           |
| ASL024 | ATM audit has ended.                                                                                             |
| ASL025 | Audit has dropped a resource on the ATM board as described in the log.                                           |
| ASL026 | Audit has established a resource on the board as described in the log.                                           |
| ASL027 | Audit has found a missing resource on the board that can't be established. The resource is described in the log. |
| APL001 | The ATM interface port has initialized correctly.                                                                |
| UAS398 | Indicates a raised alarm in a UAS device                                                                         |
| UAS399 | Indicates a cleared alarm in a UAS device                                                                        |

**USP Logs/Faults**

For detailed information on logs, refer to NN10275-909, *Fault Management Log Reference*.

USP faults are available to the OSS via a third-party fault probe or fault collector. The fault probe/collector must reside somewhere on the OAM&P VLAN due to security rules for accessing the network elements.

USP logs are available on the USP PC Client GUI.

USP supports SSV format. For details on this format, refer to the Performance section of the FCAPS documentation on USP, NN10137-711.







# Operational measurements/performance measurements

Operating company personnel use operational measurements (OMs) and performance measurements (PMs) to obtain information on the performance and traffic load on a Succession Network. This data provides the information required for network planning and engineering.

## OMs/PMs collection and delivery

There are two major OM/PM interfaces used in SN08:

- For CS2K Core OMs, SDM functionality uses either OM Data Delivery (OMDD) or EADAS. The OMs are grouped into user-defined report elements, formatted into CSV (comma-separated value) format, and delivered to a customer OSS (operations support system). The OMDD application delivers OMs only for the MG 4000, IW-SPM, DPT-SPM, SPM, and XA-Core. For more complete details on the CS2K Core OMs, refer to NN10264-709, *Carrier Voice over IP Performance Management: Operational Measurements Reference*.
- The following CS2K Network Elements use the Integrated Element Management System (IEMS) single performance interface to OSS in Common Performance Record Format (CSV or XML): GWC, Storm, ERS8600 (formerly Passport 8600), MS, USP (raw format), MSS15000, MG9000, MCS, MAS, RTP Portal.

The Integrated EMS provides a centralized location for collecting, storing and forwarding performance data in a CS 2000 central office. Its performance collection sub-system provides some basic tools for viewing and graphing the collected performance attributes. In addition, it does provide interfaces to configure the generation of threshold alarms for the collected Operation Measurement data. For detailed information on the IEMS performance management features please refer to the Integrated EMS Performance Management document (NN10327-711). You may also refer to chapter one of this document, *IEMS Functionality*.

## Available OMs/ PMs

The OM/PM listings on the following pages are limited to the data accessible through OSS interfaces. These listings do not include those network elements

that employ their own graphical user interfaces for delivery/viewing of OM/PM data.

### CS 2000 Core OMs/PMs

The following table lists operational measurements (OMs) and performance measurements (PMs) **that are new or changed since SN04** and that are available from the Call Server 2000 Core network element. For a complete list of Core OMs/PMs available in Carrier Voice over IP, refer to NN10264-709, *Performance Management Operational Measurements Reference*.

CS 2000 Core supports CSV and EADAS formats through SDM functionality. For details on EADAS, refer to the Performance section of CS 2000 FCAPS documentation, NN10149-711.

#### CS 2000 Core OMs/PMs

| OM Group<br>or PM name Registers                                                                                                  | Description                                                                                                      | Applicability |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------|
| <b>Network Element: CS 2000 Core</b>                                                                                              |                                                                                                                  |               |
| <b>AINTRAN</b> AIN Transports group--new in SN08                                                                                  |                                                                                                                  | AIN           |
| INSCMSGO                                                                                                                          | Pegs Outgoing IN messages using SCTP                                                                             |               |
| INSCMSGI                                                                                                                          | Pegs Incoming IN messages using SCTP                                                                             |               |
| INSSNDFA                                                                                                                          | Pegs IN messages using SCTP for which send failed                                                                |               |
| INSCDERR                                                                                                                          | Pegs IN messages which encountered errors at application data                                                    |               |
| INSCTBIG                                                                                                                          | Pegs IN Messages which failed due to message length                                                              |               |
| INSCTBMS                                                                                                                          | Pegs instances when buffer errors encountered while sending IN messages over SCTP                                |               |
| <b>ATTAMA2</b> CAIN Triggers group (Applies only to DMS)--new in SN08                                                             |                                                                                                                  | CAIN          |
| Used for register overflows from the OM group ATTAMA, only when the BAS00023 SOC is ON, and only for registers AMANS and AMUNANS. |                                                                                                                  |               |
| QUERYSCU                                                                                                                          | Counts call attempts that are unsuccessful because switching equipment in another office handles too many calls. |               |
| ISCONUCC                                                                                                                          | Counts the number of times a CAIN call queries the SCU.                                                          |               |
| <b>AUDSRVS</b> --provides one tuple for each Audio Server (AUD) node. These OMs appear in the Core only.                          |                                                                                                                  | MG9K          |
| ANNCINSU                                                                                                                          | Announcement port in-service usage                                                                               |               |
| ANNCOOSU                                                                                                                          | Announcement port out-of-service usage                                                                           |               |
| ANNCTRU                                                                                                                           | Announcement port traffic usage                                                                                  |               |
| ANNCFTRU                                                                                                                          | Announcement port fast traffic usage                                                                             |               |
| CNF3INSU                                                                                                                          | 3-port conference circuit in-service usage                                                                       |               |
| CNF3OOSU                                                                                                                          | 3-port conference circuit out-of-service usage                                                                   |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name                                                         | Registers                                                | Description                                                                                                                 | Applicability |
|--------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                | CNF3TRU                                                  | 3-port conference circuit traffic usage                                                                                     |               |
|                                                                                | CNF3FTRU                                                 | 3-port conference circuit fast traffic usage                                                                                |               |
|                                                                                | CNF6INSU                                                 | 6-port conference circuit in-service usage                                                                                  |               |
|                                                                                | CNF6OOSU                                                 | 6-port conference circuit out-of-service usage                                                                              |               |
|                                                                                | CNF6TRU                                                  | 6-port conference circuit traffic usage                                                                                     |               |
|                                                                                | CNF6FTRU                                                 | 6-port conference circuit fast traffic usage                                                                                |               |
| <b>CAINTRIG</b>                                                                | CAIN Triggers group                                      |                                                                                                                             | CAIN          |
|                                                                                | QUERYSCU                                                 | Counts call attempts that are unsuccessful because switching equipment in another office handles too many calls.            |               |
|                                                                                | ISCONUCC                                                 | Counts the number of times a CAIN call queries the SCU.                                                                     |               |
| <b>CMR FM OMs:</b> The following OMs are maintained by the CMR FM application: |                                                          |                                                                                                                             |               |
|                                                                                | ADSI                                                     | No usage metering; no peg counts.                                                                                           |               |
|                                                                                | BCLID                                                    | No usage metering; no peg counts.                                                                                           |               |
|                                                                                | CID                                                      | Counts CID attempts and CID completions.                                                                                    |               |
|                                                                                | CMWI                                                     | No usage metering; no peg counts.                                                                                           |               |
|                                                                                | DSCWID                                                   | Counts DSCWID attempts.                                                                                                     |               |
|                                                                                | SCWID                                                    | Counts SCWID attempts.                                                                                                      |               |
| <b>CP</b>                                                                      | Call Processing Software Resources group                 |                                                                                                                             | CS2K Core     |
|                                                                                | CPLOSZ                                                   | Counts origination messages correctly attached to a call condense block.                                                    |               |
|                                                                                | CINITC                                                   | Counts call condense blocks that were in use at the time of a cold restart.                                                 |               |
|                                                                                | WAKESZ                                                   | Counts CPWAKEUP block seizures.                                                                                             |               |
| <b>DCAMCEIA</b>                                                                | Dynamically Controlled Access Ineffective Attempts group |                                                                                                                             |               |
|                                                                                | FR_TRUNK                                                 | Counts the termination failures that the DCA considers ineffective attempts toward DNS for calls that come in from a trunk. |               |
|                                                                                | TO_TRUNK                                                 | Counts the termination failures that the DCA considers ineffective attempts toward DNs for calls that terminate to a trunk. |               |
|                                                                                | TOTAL                                                    | Counts the termination failures that the DCA considers ineffective attempts toward DNs.                                     |               |
|                                                                                | TRMT                                                     | Counts the termination failures that the DCA considers ineffective attempts toward DNs.                                     |               |
|                                                                                | ISUP                                                     | Counts the termination failures that the DCA considers ineffective attempts toward DNs.                                     |               |

## CS 2000 Core OMs/PMs

| OM Group<br>or PM name | Registers                                                                                                                                                                                                                                                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicability |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>DPTNODE</b>         | Dynamic packet trunk node type (SPM or DPT), PM #, and node #                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | DPT-SPM       |
|                        | SN07 adds the following: If the DPT Node is a GWC, then the associated DPT protocol (i.e., BICC or SIP-T) is added to the information. If the DPT Node is an SPM (i.e., either MG4K or DTP SPM), then the associated bearer network, DPT protocol and SPM node type is added to the information. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
|                        | DPTGTAT                                                                                                                                                                                                                                                                                          | The number of attempts to get a DPT Terminal for a particular DPT node, pegged every time an attempt to get a DPT terminal is made within a given transfer period. For a typical SIPT call the number of pegs is in the range of 1 peg per DPT agent per call. For a typical BICC call the number of pegs is in the range of 1 to 3 pegs per DPT agent per call.                                                                                                                                        |               |
|                        | DPTGTAT2                                                                                                                                                                                                                                                                                         | Extension of DPTGTAT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|                        | DPTGTFL                                                                                                                                                                                                                                                                                          | The number of attempts to get a DPT Terminal that failed (non-optimized) for a particular DPT node, pegged every time an attempt to get a <i>non-optimized</i> DPT terminal fails within a given transfer period.                                                                                                                                                                                                                                                                                       |               |
|                        | DPTUSAG                                                                                                                                                                                                                                                                                          | The number of DPT Terminals in use for a particular DPT node, pegged every one-hundred seconds within a given transfer period.                                                                                                                                                                                                                                                                                                                                                                          |               |
|                        | DPTUSAG2                                                                                                                                                                                                                                                                                         | Extension of DPTUSAG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|                        | DPTGTFL0                                                                                                                                                                                                                                                                                         | The number of attempts to get a DPT Terminal that failed (optimized) for a particular DPT node, pegged every time an attempt to get an <i>optimized</i> DPT terminal fails within a given transfer period. Optimized failure attempts on nodes "not DPT-enabled" are not pegged against this register.<br>Pegs to this register do not signify call failures. The optimized failure attempt to get an optimized terminal is immediately followed by an attempt to get a non-optimized terminal instead. |               |
|                        | DPTHWT                                                                                                                                                                                                                                                                                           | The high water mark for number of DPT Terminals in use for a particular DPT node, pegged every ten seconds within a given transfer period.                                                                                                                                                                                                                                                                                                                                                              |               |
| <b>DPTOFC</b>          | Dynamic packet trunk office events                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | DPT-SPM       |
|                        | DPGTAT                                                                                                                                                                                                                                                                                           | The number of attempts to get a DPT Terminal, pegged every time an attempt to get a DPT terminal is made within a given transfer period. For a typical SIPT call the number of pegs is in the range of 1 peg per DPT agent per call. For a typical BICC call the number of pegs is in the range of 1 to 3 pegs per DPT agent per call.                                                                                                                                                                  |               |

## CS 2000 Core OMs/PMs

| OM Group<br>or PM name | Registers | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Applicability |
|------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                        | DPGTAT2   | Extension register of DPGTAT incremented when DPGTAT reaches 65,535                                                                                                                                                                                                                                                                                                                                                                                                               |               |
|                        | DPGTFL    | The number of attempts to get a DPT Terminal that failed (non-optimized), pegged every time an attempt to get a <i>non-optimized</i> DPT terminal fails within a given transfer period.                                                                                                                                                                                                                                                                                           |               |
|                        | DPGTFL2   | Extension register of DPGTFL incremented when DPGTFL reaches 65,535                                                                                                                                                                                                                                                                                                                                                                                                               |               |
|                        | DPUSAG    | The number of DPT Terminals in use, pegged every one-hundred seconds within a given transfer period. Since this register is an accumulator and is added to itself the register can be misleading.<br><br>To interpret the usage register, divide the value by the number of slow samples to determine the average usage for a given transfer period.                                                                                                                              |               |
|                        | DPUSAG2   | Extension register of DPUSAG incremented when DPUSAG reaches 65,535                                                                                                                                                                                                                                                                                                                                                                                                               |               |
|                        | DPGTFLO   | The number of attempts to get a DPT Terminal that failed (optimized), pegged every time an attempt to get an <i>optimized</i> DPT terminal fails within a given transfer period. Optimized failure attempts on nodes "not DPT-enabled" are not pegged against this register.<br><br>Pegs to this register do not signify call failures. The optimized failure attempt to get an optimized terminal is immediately followed by an attempt to get a non-optimized terminal instead. |               |
|                        | DPGTFLO2  | Extension register of DPGTFLO incremented when DPGTFLO reaches 65,535                                                                                                                                                                                                                                                                                                                                                                                                             |               |
|                        | DPHWT     | The high water mark for number of DPT Terminals in use, pegged every ten seconds within a given transfer period.                                                                                                                                                                                                                                                                                                                                                                  |               |
|                        | DPHWT2    | Extension register of DPHWT incremented when DPHWT reaches 65,535                                                                                                                                                                                                                                                                                                                                                                                                                 |               |
|                        | DPDPL     | Number of attempts to get a DPT terminal that failed due to port depletion, pegged every time an attempt to get a DPT terminal fails due to port depletion within a given transfer period.                                                                                                                                                                                                                                                                                        |               |
|                        | DPDPL2    | Extension register of DPDPL incremented when DPDPL reaches 65,535                                                                                                                                                                                                                                                                                                                                                                                                                 |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name | Registers                                                                                                                                                                                                                                                                                                                                                                                                   | Description                                                                                                                     | Applicability |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>DPTOFCP</b>         | DPT Office Protocol group--new in SN07<br>This OM group measures the performance of the supported dynamic packet trunk protocols for the office. The two supported protocols are BICC and SIP-T. The addition of this new DPTOFCP OM group is controlled by the value of a new SN07 office parameter, MULTINET_DISPLAY_ACTIVE. If this parameter is set to 'Y', then the new DPTOFCP OM group is displayed. |                                                                                                                                 | DPT-SPM       |
| <b>DTSRPM</b>          | Pegs originations and dialtone delays grouped by the type of line making the call (DP, DTMF, or Pphone).                                                                                                                                                                                                                                                                                                    |                                                                                                                                 | GWC           |
|                        | DPLTOT                                                                                                                                                                                                                                                                                                                                                                                                      | Dial Pulse Lines Total Originations. This value is always 0 for CS2K lines since no differentiation is made between DP and DGT. |               |
|                        | DPLDLY                                                                                                                                                                                                                                                                                                                                                                                                      | Dial Pulse Line Delays. Counts DP lines which got dial tone after 3 seconds. Always 0 for CS2K.                                 |               |
|                        | DGTTOT                                                                                                                                                                                                                                                                                                                                                                                                      | Counts Digit Tone Line Total Originations.                                                                                      |               |
|                        | DGTDLY                                                                                                                                                                                                                                                                                                                                                                                                      | Digit Tone Line Delays. Counts DGT lines which got dial tone after 3 seconds.                                                   |               |
|                        | KSTOT                                                                                                                                                                                                                                                                                                                                                                                                       | Keyset (Pphone) Lines Total Originations.                                                                                       |               |
|                        | KSDLY                                                                                                                                                                                                                                                                                                                                                                                                       | Keyset (Pphone) Lines which got dial tone after 3 seconds.                                                                      |               |
| <b>ENETPLNK</b>        | ENET Peripheral Side Links group. The registers listed here are the only ones supported for SPM and MG4K applications.                                                                                                                                                                                                                                                                                      |                                                                                                                                 | DPT-SPM       |
|                        | ENSPCHER                                                                                                                                                                                                                                                                                                                                                                                                    | NOTE: This is an existing OM group. For details on the                                                                          |               |
|                        | ENLKERR                                                                                                                                                                                                                                                                                                                                                                                                     | registers, see NTP 297-2621-814, available on Helmsman                                                                          |               |
|                        | ENLKFLT                                                                                                                                                                                                                                                                                                                                                                                                     | Express.                                                                                                                        |               |
|                        | ENSBLKU                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |               |
|                        | ENMBLKU                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                 |               |
|                        | ENLKPARU                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |               |
|                        | ENSLKPAR                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |               |
|                        | ENMLKPAR                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |               |
|                        | ENLNKISOU                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                 |               |
|                        | ENSLKISO                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |               |
|                        | ENMLKISO                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 |               |
| <b>ETHERNET</b>        | OM group                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                 | CS2K Core     |
|                        | Alignment Errors                                                                                                                                                                                                                                                                                                                                                                                            | The counter associated with AlignErr Collection Interval.                                                                       |               |
|                        | FCS Errors                                                                                                                                                                                                                                                                                                                                                                                                  | The counter associated with FcsErr Collection Interval.                                                                         |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name                                                                                                                                                                                                                                                                                                          | Registers                                           | Description                                                                                                                         | Applicability |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                                                                                                                                                                                 | Internal MAC<br>Receive Errors                      | The counter associated with Internalmacrxerr.                                                                                       |               |
|                                                                                                                                                                                                                                                                                                                                 | Frame Too Long                                      | The counter associated with Frtoolongs.                                                                                             |               |
|                                                                                                                                                                                                                                                                                                                                 | Internal MAC TX<br>Errors                           | The counter associated with Internalmactxerr.                                                                                       |               |
|                                                                                                                                                                                                                                                                                                                                 | Symbol Errors                                       | The counter associated with Symbolerr.                                                                                              |               |
|                                                                                                                                                                                                                                                                                                                                 | Inpause Frames                                      | The counter associated with Inpausefr.                                                                                              |               |
|                                                                                                                                                                                                                                                                                                                                 | Outpause<br>Frames                                  | The counter associated with Outpausefr.                                                                                             |               |
| <b>FCDRTM1E</b>                                                                                                                                                                                                                                                                                                                 | (Applies only to DMS)                               |                                                                                                                                     | CS2K Core     |
| Used for register overflows from the OM group FCDRTMP1, only when the UBFR0008 SOC is ON. This OM group provides 32 pre-defined tuples. Each register is associated with the CDR template being used for a CDR billing record. The CDR template index corresponds to the register number. This OM group supports indexes 0-31.  |                                                     |                                                                                                                                     |               |
| <b>FCDRTM2E</b>                                                                                                                                                                                                                                                                                                                 | (Applies only to DMS)                               |                                                                                                                                     | CS2K Core     |
| Used for register overflows from the OM group FCDRTMP2, only when the UBFR0008 SOC is ON. This OM group provides 32 pre-defined tuples. Each register is associated with the CDR template being used for a CDR billing record. The CDR template index corresponds to the register number. This OM group supports indexes 32-63. |                                                     |                                                                                                                                     |               |
| <b>FCDRALG2</b>                                                                                                                                                                                                                                                                                                                 | (Applies only to DMS)                               |                                                                                                                                     | CS2K Core     |
| Used for register overflows from the OM group FCDRALGR, only when the UBFR0008 SOC is ON. For these extension registers one count here is equal to 65535 counts of the same register in FCDRALGR.                                                                                                                               |                                                     |                                                                                                                                     |               |
| <b>IOCAP</b>                                                                                                                                                                                                                                                                                                                    | IO Capacity for messaging over HIOP and HCMIC group |                                                                                                                                     | CS2K Core     |
|                                                                                                                                                                                                                                                                                                                                 | IO_SERVICE_T<br>YPE                                 | Indicates the service provided.                                                                                                     |               |
|                                                                                                                                                                                                                                                                                                                                 | IOUTIL                                              | Refers to percentage utilization of the services on the switch.                                                                     |               |
|                                                                                                                                                                                                                                                                                                                                 | IOHWM                                               | Refers to the highest level that the corresponding utilization has reached in the sample period.                                    |               |
|                                                                                                                                                                                                                                                                                                                                 | TxMSG/S,<br>TxSIZE,<br>RxMSG/S,<br>RxSIZE           | Report the average transmit and receive message rates and sizes through the service.                                                |               |
|                                                                                                                                                                                                                                                                                                                                 | IOTHRESH                                            | Pegged every time the service average utilization for one minute exceeds the value of OFCENG office parameter IO_WARNING_THRESHOLD. |               |
| <b>ISUPCONN</b>                                                                                                                                                                                                                                                                                                                 | ISUP Connection group                               |                                                                                                                                     | CS2K Core     |



**CS 2000 Core OMs/PMs**

| <b>OM Group or PM name</b> |                                                                                                                                                                    | <b>Registers</b> | <b>Description</b>                                                                                                                    | <b>Applicability</b> |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                            |                                                                                                                                                                    | ISCONUCC         | Added to count call attempts that are unsuccessful because there are no available idle circuits in another office to handle the call. |                      |
|                            |                                                                                                                                                                    | ISCONUCE         | Added to count call attempts that are unsuccessful because switching equipment in another office handles too many calls.              |                      |
|                            |                                                                                                                                                                    | ISCONUCF         | Added to count call attempts that are unsuccessful because of a temporary fault in the far-end network.                               |                      |
| <b>IWBM</b>                | Interworking bridge manager events (associated with IW SPMs)                                                                                                       |                  |                                                                                                                                       | IW-SPM               |
|                            |                                                                                                                                                                    | IWGBATT          | Get bridge attempts                                                                                                                   |                      |
|                            |                                                                                                                                                                    | IWGBATT2         | Extension of IWGBATT                                                                                                                  |                      |
|                            |                                                                                                                                                                    | IWGBFAIL         | Get bridge attempt failures                                                                                                           |                      |
|                            |                                                                                                                                                                    | IWGGBABRT        | Get bridge attempts aborted                                                                                                           |                      |
|                            |                                                                                                                                                                    | IWFBATT          | Free bridge attempts                                                                                                                  |                      |
|                            |                                                                                                                                                                    | IWFBATT2         | Extension of IWFBATT                                                                                                                  |                      |
|                            |                                                                                                                                                                    | IWFBFAIL         | Free bridge attempt failures                                                                                                          |                      |
|                            |                                                                                                                                                                    | IWFBABRT         | Free bridge attempts aborted                                                                                                          |                      |
|                            |                                                                                                                                                                    | IWONSET1         | Total IW SPMs in use reached 70%                                                                                                      |                      |
|                            |                                                                                                                                                                    | IWONSET2         | Total IW SPMs in use reached 90%                                                                                                      |                      |
|                            |                                                                                                                                                                    | IWABATE1         | Total IW SPMs in use less than 65%                                                                                                    |                      |
|                            |                                                                                                                                                                    | IWABATE2         | Total IW SPMs in use less than 85%                                                                                                    |                      |
| <b>MNGEMLNK</b>            | Multiservice Node Gigabit Ethernet Module Link Bandwidth Engineering provides Gigabit Ethernet Link usage statistics to assist with network bandwidth Engineering. |                  |                                                                                                                                       | IW-SPM               |
|                            |                                                                                                                                                                    | TXOCT            | Provides count for total number of bytes transmitted on a Gigabit Ethernet Link connected to a particular MG4K-IP/IW-IP node.         |                      |
|                            |                                                                                                                                                                    | TXOCT2           | Extension of TXOCT.                                                                                                                   |                      |
|                            |                                                                                                                                                                    | RXOCT            | Provides count for total number of bytes received on a GigE Link connected to a particular MG4K-IP/IW-IP node.                        |                      |
|                            |                                                                                                                                                                    | RXOCT2           | Extension of RXOCT.                                                                                                                   |                      |
|                            |                                                                                                                                                                    | TXPKT            | Provides count for total number of packets transmitted on a GigE Link connected to a particular MG4K-IP/IW-IP node.                   |                      |
|                            |                                                                                                                                                                    | TXPKT2           | Extension of TXPKT.                                                                                                                   |                      |
|                            |                                                                                                                                                                    | RXPKT            | Provides count for total number of packets received on a GigE Link connected to a particular MG4K-IP/IW-IP node.                      |                      |



**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name                                                                                                   | Registers | Description                                                                                                                                                | Applicability |
|--------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                          | RXPKT2    | Extension of RXPKT.                                                                                                                                        |               |
|                                                                                                                          | TXEROCT   | Provides count for total number of bytes transmitted in errored packets on a GigE Link connected to a particular MG4K-IP/IW-IP node.                       |               |
|                                                                                                                          | TXEROCT2  | Extension of TXEROCT.                                                                                                                                      |               |
|                                                                                                                          | RXEROCT   | Provides count for total number of bytes received in errored packets on a GigE Link connected to a particular MG4K-IP/IW-IP node.                          |               |
|                                                                                                                          | RXEROCT2  | Extension of RXEROCT.                                                                                                                                      |               |
|                                                                                                                          | TXERPCT   | Provides count for total number of errored packets transmitted on a GigE Link connected to a particular MG4K-IP/IW-IP node.                                |               |
|                                                                                                                          | RXERPCT   | Provides count for total number of errored packets received on a GigE Link connected to a particular MG4K-IP/IW-IP node.                                   |               |
|                                                                                                                          | CRCERPCT  | Provides count for total number of packets received with Cyclic Redundancy Check (CRC) errors on a GigE Link connected to a particular MG4K-IP/IW-IP node. |               |
|                                                                                                                          | UNDERPCT  | Provides count for total number of undersize packets received on a GigE Link connected to a particular MG4K-IP/IW-IP node.                                 |               |
|                                                                                                                          | OVERPCT   | Provides count for total number of oversize packets received on a GigE Link connected to a particular MG4K-IP/IW-IP node.                                  |               |
|                                                                                                                          | SHORTPCT  | Provides count for total number of short packets (aka fragments) received, on a GigE Link connected to a particular MG4K-IP/IW-IP node.                    |               |
|                                                                                                                          | LONGPCT   | Provides count for total number of long packets (aka jabber) received on a GigE Link connected to a particular MG4K-IP/IW-IP node.                         |               |
| <b>MNGEMTRF</b> Multiservice Node Gigabit Ethernet Module Traffic Engineering provides statistics of Nodal traffic usage |           |                                                                                                                                                            | IW-SPM        |
|                                                                                                                          | TOTCONN   | Provides count for total number connections handled by a particular MG4K-IP/IW-IP node.                                                                    |               |
|                                                                                                                          | TXRTPOCT  | Provides count for total number of RTP bytes transmitted from a MG4K-IP/IW-IP node. Register TXRTPOCT2 is an extension register for TXRTPOCT.              |               |
|                                                                                                                          | TXRTPOCT2 | Extension of TXRTPOCT.                                                                                                                                     |               |
|                                                                                                                          | RXRTPOCT  | Provides count for total number of RTP bytes received for a MG4K-IP/IW-IP node.                                                                            |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name | Registers | Description                                                                                                                               | Applicability |
|------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                        | RXRTPOCT2 | Extension of RXRTPOCT.                                                                                                                    |               |
|                        | G711MUCN  | Provides count for total number of G.711 MuLaw codec connections handled by a particular MG4K-IP/IW-IP node.                              |               |
|                        | G711ACN   | Provides count for total number of G.711 A-Law codec connections handled by a particular MG4K-IP/IW-IP node.                              |               |
|                        | TXG711PK  | Provides count for total number of RTP packets transmitted for G.711 connections handled by a particular MG4K-IP/IW-IP node.              |               |
|                        | TXG711PK2 | Extension of TXG711PK.                                                                                                                    |               |
|                        | RXG711PK  | Provides count for total number of RTP packets received for G.711 connections handled by a particular MG4K-IP/IW-IP node.                 |               |
|                        | RXG711PK  | Extension of RXG711PK.                                                                                                                    |               |
|                        | G729CN    | Provides count for total number of G.729 connections handled by a particular MG4K-IP/IW-IP node.                                          |               |
|                        | TXG729PK  | Provides count for total number of RTP packets transmitted for G.729 connections handled by a particular MG4K-IP/IW-IP node.              |               |
|                        | TXG729PK  | Extension of TXG729PK                                                                                                                     |               |
|                        | RXG729PK  | Provides count for total number of RTP packets received for G.729 connections handled by a particular MG4K-IP/IW-IP node.                 |               |
|                        | RXG729PK  | Extension of RXG729PK                                                                                                                     |               |
|                        | CCDCN     | Provides count for total number of 64K Clear Channel Data (CCD) Connections handled by a particular MG4K-IP/IW-IP node.                   |               |
|                        | TXCCDPK   | Provides count for total number of RTP packets transmitted for Clear Channel Data connections handled by a particular MG4K-IP/IW-IP node. |               |
|                        | RXCCDPK   | Provides count for total number of RTP packets received for Clear Channel Data connections handled by a particular MG4K-IP/IW-IP node.    |               |
|                        | VBDCN     | Provides count for total number of Voice Band Data (VBD) Connections handled by a particular MG4K-IP/IW-IP node.                          |               |
|                        | TXVBDPK   | Provides count for total number of packets transmitted for Voice Band Data connections handled by a particular MG4K-IP/IW-IP node.        |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name                                                                                                                         | Registers | Description                                                                                                                                  | Applicability |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                | RXVBDPK   | Provides count for total number of packets received for Voice Band Data connections handled by a particular MG4K-IP/IW-IP node.              |               |
|                                                                                                                                                | T38CN     | Provides count for total number of T.38 connections handled by a particular MG4K-IP/IW-IP node.                                              |               |
|                                                                                                                                                | TXT38PK   | Provides count for total number of packets transmitted for T.38 connections handled by a particular MG4K-IP/IW-IP node.                      |               |
|                                                                                                                                                | RXT38PK   | Provides count for total number of packets received for T.38 connections handled by a particular MG4K-IP/IW-IP node.                         |               |
|                                                                                                                                                | RF2833CN  | Provides count for total number of RFC2833 connections handled by a particular MG4K-IP/IW-IP node.                                           |               |
|                                                                                                                                                | SLSUPCN   | Provides count for total number of Silence Suppression connections handled by a particular MG4K-IP/IW-IP node.                               |               |
| <b>NGSSOM</b> Next Generation Session Server OM group                                                                                          |           |                                                                                                                                              | NGSS          |
|                                                                                                                                                | CS2ASOVF  | Pegged when a CS2AS NGSS call is deflected because allowing the call would have caused the current CS2AS call count to exceed the SOC limit. |               |
|                                                                                                                                                | CS2ASHWM  | Keeps track of the maximum value reached for the CS2AS call counter.                                                                         |               |
|                                                                                                                                                | CS2CSOVF  | Pegged when a CS2CS NGSS call is deflected because allowing the call would have caused the current CS2CS call count to exceed the SOC limit. |               |
|                                                                                                                                                | CS2CSHWM  | Keeps track of the maximum value reached for the CS2CS call counter.                                                                         |               |
| <b>NMTCUNIT</b> Node Maintenance Unit Measurements group. The registers listed here are the only ones supported for SPM and MG4K applications. |           |                                                                                                                                              | DPT-SPM       |
|                                                                                                                                                | NDUERR    | NOTE: This is an existing OM group. For details on the                                                                                       |               |
|                                                                                                                                                | NDUFLT    | registers, see NTP 297-2621-814, available on Helmsman                                                                                       |               |
|                                                                                                                                                | NDUMBP    | Express.                                                                                                                                     |               |
|                                                                                                                                                | NDUMBU    |                                                                                                                                              |               |
|                                                                                                                                                | NDUMCRST  |                                                                                                                                              |               |
|                                                                                                                                                | NDUMRRST  |                                                                                                                                              |               |
|                                                                                                                                                | NDUNAP    |                                                                                                                                              |               |
|                                                                                                                                                | NDUSBP    |                                                                                                                                              |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name | Registers                                                                                                     | Description                                                                                                                       | Applicability |
|------------------------|---------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|---------------|
|                        | NDUSB                                                                                                         |                                                                                                                                   |               |
|                        | NDUNAU                                                                                                        |                                                                                                                                   |               |
|                        | NDUSWERR                                                                                                      |                                                                                                                                   |               |
|                        | NDUTRAP                                                                                                       |                                                                                                                                   |               |
| <b>NWMFRRCT</b>        | Network Management Flexible Reroute group                                                                     |                                                                                                                                   | CS2K Core     |
|                        | FRRATTCT                                                                                                      | Counts calls that are rerouted to a Virtual Interworking Agent (VIA) route list. Required for ACC (Automatic Congestion Control). |               |
|                        | FRRFLCT                                                                                                       | Counts rerouted calls that fail to find an idle VIA route list. Required for ACC (automatic congestion control).                  |               |
| <b>PCEM</b>            | Performance Measurements                                                                                      |                                                                                                                                   | CS2K Core     |
|                        | EMSENT                                                                                                        | Event message successfully generated.                                                                                             |               |
|                        | EMFAIL                                                                                                        | Failed to build event message.                                                                                                    |               |
|                        | EMSYSFL                                                                                                       | System unable to send event message.                                                                                              |               |
|                        | EMSENT2                                                                                                       | Overflow register for EMSENT                                                                                                      |               |
|                        | EMFAIL2                                                                                                       | Overflow register for EMFAIL                                                                                                      |               |
|                        | EMSYSFL2                                                                                                      | Overflow register for EMSYSFL                                                                                                     |               |
| <b>PKTMA</b>           | Packet Media Anchor group                                                                                     |                                                                                                                                   | GWC           |
|                        | PMAREQST                                                                                                      | A peg register to indicate the number of anchored call attempts.                                                                  |               |
|                        | PMAFLNR                                                                                                       | A peg register to indicate the number of failed anchored call attempts due to the unavailability of resources.                    |               |
|                        | PMAHWM                                                                                                        | A high water mark register to indicate the maximum number of simultaneous anchored calls.                                         |               |
| <b>PM</b>              | Peripheral Module group. The registers listed here are the only ones supported for SPM and MG4K applications. |                                                                                                                                   | DPT-SPM       |
|                        | PMERR                                                                                                         | NOTE: This is an existing OM group. For details on the                                                                            |               |
|                        | PMFLT                                                                                                         | registers, see NTP 297-2621-814, available on Helmsman                                                                            |               |
|                        | PMMSBU                                                                                                        | Express.                                                                                                                          |               |
|                        | PMUMBU                                                                                                        |                                                                                                                                   |               |
|                        | PMSBP                                                                                                         |                                                                                                                                   |               |
|                        | PMMBP                                                                                                         |                                                                                                                                   |               |
|                        | PMMWXFR                                                                                                       |                                                                                                                                   |               |
|                        | PMMCXFR                                                                                                       |                                                                                                                                   |               |
|                        | PMINTEG                                                                                                       |                                                                                                                                   |               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name | Registers                                                                                                          | Description                                                                                                            | Applicability     |
|------------------------|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------|
| <b>PMTYP</b>           | Peripheral Module Type group. The registers listed here are the only ones supported for SPM and MG4K applications. |                                                                                                                        | DPT-SPM           |
|                        | PMTERR                                                                                                             | NOTE: This is an existing OM group. For details on the registers, see NTP 297-2621-814, available on Helmsman Express. |                   |
|                        | PMTFLT                                                                                                             |                                                                                                                        |                   |
|                        | PMTMSBU                                                                                                            |                                                                                                                        |                   |
|                        | PMTUSBU                                                                                                            |                                                                                                                        |                   |
|                        | PMTMMBU                                                                                                            |                                                                                                                        |                   |
|                        | PMTSBP                                                                                                             |                                                                                                                        |                   |
|                        | PMTMBP                                                                                                             |                                                                                                                        |                   |
|                        | PMTMWXFR                                                                                                           |                                                                                                                        |                   |
|                        | PMTMCXFR                                                                                                           |                                                                                                                        |                   |
|                        | PMTINTEG                                                                                                           |                                                                                                                        |                   |
| <b>SCMP</b>            | SCMPTRF                                                                                                            | If an SCMP line is found Callp busy, the SCMPTRF register will be pegged for that line.                                | Line Provisioning |
|                        | SCMPMNT                                                                                                            | If an SCMP line is found maintenance busy or unavailable, the SCMPTRF register will be pegged for that line.           |                   |
| <b>SMSTOPS</b>         | This OM group records application-level events for the TOPS short message service.                                 |                                                                                                                        | TOPS              |
|                        | SMSSSENT,<br>SMSSSENT2                                                                                             | SMS sent                                                                                                               |                   |
|                        | SMSSUCC,<br>SMSSUCC2                                                                                               | SMS success                                                                                                            |                   |
|                        | SMSFAIL,<br>SMSFAIL2                                                                                               | SMS failure                                                                                                            |                   |
|                        | SMSTIME,<br>SMSTIME2                                                                                               | SMS time-out                                                                                                           |                   |
|                        | SMSNETWK                                                                                                           | SMS failure due to network problems                                                                                    |                   |
|                        | SMSTERM                                                                                                            | SMS failure due to terminal (cell phone) problems                                                                      |                   |
|                        | SMSRADIO                                                                                                           | SMS failure due to radio interface problems                                                                            |                   |
|                        | SMSMISC                                                                                                            | Miscellaneous SMS failure                                                                                              |                   |
| <b>SPMOVLD</b>         | Spectrum Overload Statistics group                                                                                 |                                                                                                                        | SPM               |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name | Registers            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                            | Applicability |
|------------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                        |                      | <p>The new SPMOVL group will have 18 OMs that give metrics on the SPM flow control system and the system overload control component. All OMs that apply to the system overload control component start with an 'S', all others apply to the flow control system. The actual peg counts and usage counts (accurate to one second) are accumulated on the peripheral and then uploaded to the OM group using the Spectrum OM Transfer System (SOTS).</p> |               |
| <b>TC7WRLSS</b>        |                      | <p>This OM group records transport-level events such as types of TCAP messages sent and received, SS7 errors, etc. on TOPS wireless calls (SMS and WIN, as well as IS-41 and GSM).</p>                                                                                                                                                                                                                                                                 |               |
|                        | INVOKES,<br>INVOKES2 | TCAP INVOKE sent                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |
|                        | INVOKER,<br>INVOKER2 | TCAP INVOKE receives                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |
|                        | RETRESS,<br>RETRESS2 | TCAP RETURN RESULT sent                                                                                                                                                                                                                                                                                                                                                                                                                                |               |
|                        | RETRESR,<br>RETRESR2 | TCAP RETURN RESULT received                                                                                                                                                                                                                                                                                                                                                                                                                            |               |
|                        | RETERRS              | TCAP RETURN ERROR sent                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |
|                        | RETERRR              | TCAP RETURN ERROR received                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
|                        | REJECTS              | TCAP REJECT sent                                                                                                                                                                                                                                                                                                                                                                                                                                       |               |
|                        | REJECTR              | TCAP REJECT received                                                                                                                                                                                                                                                                                                                                                                                                                                   |               |
|                        | ABORTS               | TCAP ABORT sent                                                                                                                                                                                                                                                                                                                                                                                                                                        |               |
|                        | ABORTR               | TCAP ABORT received                                                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|                        | NOTRIDS              | No transaction identifiers                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
|                        | MBFULL               | Incoming message from MSC ignored due to heavy traffic                                                                                                                                                                                                                                                                                                                                                                                                 |               |
|                        | RTFNOXLA             | SCCP routing failure: No translation of such nature                                                                                                                                                                                                                                                                                                                                                                                                    |               |
|                        | RTFNOXLS             | SCCP routing failure: No translation for this specific address                                                                                                                                                                                                                                                                                                                                                                                         |               |
|                        | RTFSUBCG             | SCCP routing failure: Subsystem congestion                                                                                                                                                                                                                                                                                                                                                                                                             |               |
|                        | RTFSUBFL             | SCCP routing failure: Subsystem failure                                                                                                                                                                                                                                                                                                                                                                                                                |               |
|                        | RTFUNEQ              | SCCP routing failure: Unequipped user                                                                                                                                                                                                                                                                                                                                                                                                                  |               |
|                        | RTFNETFL             | SCCP routing failure: Network failure                                                                                                                                                                                                                                                                                                                                                                                                                  |               |
|                        | RTFNETCG             | SCCP routing failure: Network congestion                                                                                                                                                                                                                                                                                                                                                                                                               |               |
|                        | RTFMISCE             | SCCP routing failure: Failure other than the above seven                                                                                                                                                                                                                                                                                                                                                                                               |               |
|                        | GTTFAIL              | Global Title Translation failure                                                                                                                                                                                                                                                                                                                                                                                                                       |               |

## CS 2000 Core OMs/PMs

| OM Group<br>or PM name | Registers | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Applicability |
|------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <b>TDGTHRU</b>         |           | TOPS Datagram Throughput.<br>This OM group counts the number of UDP messages sent and received in each of several "buckets" or message size ranges. Each register in this group counts the number of messages in a specific size range that were sent by or received by a particular TOPS application, using a particular Ethernet interface. The group consists of 14 registers and 14 extension registers, counting message sizes ranging from <= 48 bytes up to > 368 bytes.                                                                                                                                                                                                                                                         | TOPS          |
| <b>TONES</b>           |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CS2K Core     |
|                        | TONEATT   | Counts calls that the system routes to each tone generator.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |               |
| <b>TRKQOS</b>          |           | records instances in which QOS threshold values have been exceeded for calls handled by a particular GWC-based TDM trunk group.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | GWC           |
|                        | PKTLOSS   | Packet Loss. Counts the number of times that the packet loss threshold has been exceeded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |
|                        | JITTER    | Jitter. Counts the number of times that the jitter threshold has been exceeded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |               |
|                        | DELAY     | Delay (latency). Counts the number of times that the delay threshold has been exceeded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |               |
| N/A                    | Existing  | As noted in the design document for 89007781 (PT-IP), the following data is reported by all gateways: packets sent; packets received; packet loss; octets sent; octets received; inter-arrival latency; jitter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | GWC           |
| (Checking)             |           | The OMs that feature 89008294 (UA-IP) will use already exist for the ATM solution, now extended to IP solutions. It includes the following OM counters: <ul style="list-style-type: none"> <li>• Intra total number of channel allocation requests</li> <li>• Intra total number of failed channel allocation requests</li> <li>• Intra total number of failed channel allocation requests</li> <li>• Inter maximum simultaneous number of channels in use</li> <li>• Inter total number of channel allocation requests</li> <li>• Inter total number of failed channel allocation requests</li> <li>• Intra total number of channel allocation requests</li> <li>• Intra total number of failed channel allocation requests</li> </ul> | GWC           |
| <b>TRNK2</b>           |           | OM group to hold extension registers from TRK OM group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | CS2K Core     |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name                                                                                                                                                                                                                              | Registers                     | Description                                                                                                                                                                                                                                                                             | Applicability |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                                                                                                                                     | TOTU2                         | Extension register of TOTU in TRK OM group                                                                                                                                                                                                                                              |               |
|                                                                                                                                                                                                                                                     | INCATOT2                      | Extension register of INCATOT in TRK OM group                                                                                                                                                                                                                                           |               |
|                                                                                                                                                                                                                                                     | TOTU2                         | Extension register of TOTU in TRK OM group                                                                                                                                                                                                                                              |               |
|                                                                                                                                                                                                                                                     | INCATOT2                      | Extension register of INCATOT in TRK OM group                                                                                                                                                                                                                                           |               |
|                                                                                                                                                                                                                                                     | NATTMPT2                      | Extension register of NATTMPT in TRK OM group                                                                                                                                                                                                                                           |               |
|                                                                                                                                                                                                                                                     | DEFLDCA                       | Extension register of DEFLD in TRK OM group                                                                                                                                                                                                                                             |               |
|                                                                                                                                                                                                                                                     | TRU2                          | Extension register of TRU in TRK OM group                                                                                                                                                                                                                                               |               |
|                                                                                                                                                                                                                                                     | SBU2                          | Extension register of SBU in TRK OM group                                                                                                                                                                                                                                               |               |
|                                                                                                                                                                                                                                                     | CONNECT2                      | Extension register of CONNECT in TRK OM group                                                                                                                                                                                                                                           |               |
|                                                                                                                                                                                                                                                     | TANDEM2                       | Extension register of TANDEM in TRK OM group                                                                                                                                                                                                                                            |               |
|                                                                                                                                                                                                                                                     | ANSWER2                       | Extension register of ANSWER in TRK OM group                                                                                                                                                                                                                                            |               |
| <b>UTR</b>                                                                                                                                                                                                                                          | Universal Tone Receiver group |                                                                                                                                                                                                                                                                                         | UAS           |
|                                                                                                                                                                                                                                                     | UTRSZRS                       | Counts each time that the system supplies a UTR to a call in response to a request.                                                                                                                                                                                                     |               |
| <b>WINTOPS.</b> This OM group records application-level events for wireless ADACC with TOPS release. This group uses WIN in the name since wireless intelligent network capabilities are used to provide ADACC with release for both IS-41 and GSM. |                               |                                                                                                                                                                                                                                                                                         |               |
|                                                                                                                                                                                                                                                     | WINBEGIN,<br>WINBEGI2         | IS-41 AnalyzedInformation or GSM InitialDP received.                                                                                                                                                                                                                                    |               |
|                                                                                                                                                                                                                                                     | REQCONN,<br>REQCONN2          | IS-41 ConnectResource or GSM EstablishTemporaryConnection sent                                                                                                                                                                                                                          |               |
|                                                                                                                                                                                                                                                     | CONNECT,<br>CONNECT2          | IS-41 AnalyzedInformation or GSM Connect sent                                                                                                                                                                                                                                           |               |
|                                                                                                                                                                                                                                                     | DISCONN,<br>DISCONN2          | IS-41 AnalyzedInformation with action code of "disconnect call" or GSM DisconnectTemporaryConnection sent. This event is not part of the normal IS-41 call flow, but it is part of the normal GSM call flow. If this is pegged for IS-41, it means ADACC with release was not provided. |               |
|                                                                                                                                                                                                                                                     | WINEND,<br>WINEND2            | GSM Application End received; no equivalent IS-41 message.                                                                                                                                                                                                                              |               |
|                                                                                                                                                                                                                                                     | ERRCONN                       | MSC could not connect to TOPS using TLDN                                                                                                                                                                                                                                                |               |
|                                                                                                                                                                                                                                                     | ERRDISC                       | TOPS disconnected unexpectedly while providing operator assistance. IS-41 only; when this occurs in a GSM call, WINEND is pegged but not DISCONN or CONNECT.                                                                                                                            |               |
|                                                                                                                                                                                                                                                     | ERRSSFT                       | MSC's service switching function timer expired. Should not happen if TOPS Reset Timer is datafilled properly in Table ISUPTRK.                                                                                                                                                          |               |



**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name | Registers                    | Description                                                                                    | Applicability |
|------------------------|------------------------------|------------------------------------------------------------------------------------------------|---------------|
|                        | ABANDON                      | Wireless caller disconnected prior to receiving ADACC with release.                            |               |
|                        | RESTIMR,<br>RESTIMR2         | ResetTimer sent (IS-41 and GSM)                                                                |               |
|                        | NOTLDNS                      | No TLDNs available in Table TOPSTLDN.                                                          |               |
|                        | NODATA                       | TOPS could not find EXT block associated with incoming TLDN call from MSC.                     |               |
|                        | RXLAFail                     | TOPS call could not obtain original called digits and defaulted to 411.                        |               |
|                        | SANTIMR                      | MSC did not release trunk to TOPS, or MSC did not send Application End.                        |               |
|                        | TLDNTIME                     | A TLDN was allocated for an MSC call which never arrived. The TLDN is allocated to a new call. |               |
| <b>XACORE</b>          | XA-Core hardware-related OMs |                                                                                                | CS2K Core     |
|                        | XAPE                         | PE (processor element) faults                                                                  |               |
|                        | XARXPE                       | Routine exercise test (RXe) PE failures                                                        |               |
|                        | XASM                         | Critical shared memory (SM) faults                                                             |               |
|                        | XARXSM                       | Routine exercise test (RXe) SM failures                                                        |               |
|                        | XAIOP                        | Critical IOP (input/output processor) faults                                                   |               |
|                        | XARXIO                       | Routine exercise test (RXe) IOP failures                                                       |               |
|                        | XADISK                       | Disk faults                                                                                    |               |
|                        | XATAPE                       | Critical tape faults                                                                           |               |
|                        | XARTIF                       | RTIF (reset terminal interface) packet faults                                                  |               |
|                        | XALOCF                       | Critical faults on a RTIF local port                                                           |               |
|                        | XAREMP                       | Critical faults on a RTIF remote port                                                          |               |
|                        | XACMIC                       | CMIC packet faults                                                                             |               |
|                        | XACXABRT                     | Routine exercise (REx) test aborts                                                             |               |
|                        | XARXBASE                     | Routine exercise test on base hardware failures                                                |               |
|                        | XARXFULL                     | Routine exercise test on all hardware failures                                                 |               |
|                        | XARXALL                      | Routine exercise test on all hardware failures                                                 |               |
|                        | XAMDI                        | Number of critical AMDI packet faults detected                                                 |               |
|                        | XAMDILNK                     | Number of critical AMDI link faults detected                                                   |               |
|                        | XETHR                        | Hardware faults on Ethernet packet                                                             |               |
|                        | XETHRPRT                     | Hardware faults on an Ethernet port                                                            |               |
|                        | XETHRLNK                     | Hardware faults on an Ethernet link                                                            |               |
| <b>XACSRVC</b>         | XA-Core service-related OMs  |                                                                                                | CS2K Core     |

**CS 2000 Core OMs/PMs**

| OM Group<br>or PM name                                                                                                                  | Registers | Description                                                                                                      | Applicability |
|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------|---------------|
|                                                                                                                                         | XAMDMAJU  | Length of time (in 100 second increments) that an AMDI major alarm condition has existed                         |               |
|                                                                                                                                         | XAMDCRIU  | Length of time (in 100 second increments) that an AMDI critical alarm condition has existed                      |               |
|                                                                                                                                         | XASSMPXU  | Length of time (in 100 second increments) that a simplex SM condition has existed as a result of a system action |               |
|                                                                                                                                         | XAMSMPXU  | Length of time (in 100 second increments) that a simplex SM condition has existed as a result of a manual action |               |
|                                                                                                                                         | XARXMPXU  | Length of time (in 100 second increments) that a SM condition has existed as the result of a REx test            |               |
|                                                                                                                                         | XASMCRIU  | Length of time (in 100 second increments) that a low SM critical alarm has existed                               |               |
|                                                                                                                                         | XALKMAJU  | Length of time (in 100 second increments) that an MScomm (message switch communication) major alarm has existed  |               |
|                                                                                                                                         | XETHRMJU  | Major alarms on an Ethernet RM                                                                                   |               |
|                                                                                                                                         | XETHRCRU  | Minor alarms on an Ethernet RM                                                                                   |               |
|                                                                                                                                         | XATRAP    | Trap interrupts                                                                                                  |               |
|                                                                                                                                         | XASWINI   | Warm restarts as a result of a system action                                                                     |               |
|                                                                                                                                         | XAMWINI   | Warm restarts as a result of a manual action                                                                     |               |
|                                                                                                                                         | XASCINI   | Cold restarts as a result of a system action                                                                     |               |
|                                                                                                                                         | XAMCINI   | Cold restarts as a result of a manual action                                                                     |               |
|                                                                                                                                         | XAPEMAJU  | XACORE period of major alarm                                                                                     |               |
|                                                                                                                                         | XAPECRIU  | XACORE period of low processing power                                                                            |               |
| <b>XPMOVL</b> Collects statistics on XPM overload conditions. This is an existing OM group that functions the same as in TDM switches.  |           |                                                                                                                  |               |
| <b>XPMOCC</b> Collects statistics on CPU occupancy in the GWC. This is an existing OM group that functions the same as in TDM switches. |           |                                                                                                                  |               |

## Performance Management

The following section describes performance measurements collected and reported by the Integrated EMS for the various network elements. Pre-IEMS Performance interfaces for Network Elements, if integrated by the customer in SN07, are still supported in SN08, but are subject to the MD process that will be published for all FCAPS interfaces.

### Audio codes Media Servers (AMS) Performance Measurements

Performance Measurements for the AudioCodes media servers are available through the Integrated EMS, and also through an SNMP interface. The media server will provide performance measurements in the form of two types:

- **Gauges:** Gauges represent the current state of activities on the media server. Gauges unlike counters can decrease in value and like counters, can increase. The value of a gauge is the current value or a snapshot of the current activity on the media server at that moment.
- **Counters:** Counters always increase in value and are cumulative. Counters, unlike gauges, never decrease in value unless the server is reset and then the counters are zeroed.

The media server performance measurements will be provided by two AudioCodes MIBs (acPerfMediaGateway and acPerfMediaServices). The first mib is generic-type of PM mib. The second PM mib is media server specific.

The generic PM mib covers the control protocol, the RTP stream, and the system packets statistics. This AC PM enterprise mibs supports statistics which apply to the media server and other AC products like gateways.

### AudioCodes media servers PMs

The media server performance measurements will be provided by two AudioCodes MIBs (acPerfMediaGateway and acPerfMediaServices). The first mib is generic-type of PM mib. The second PM mib is media server

specific. The first table shows performance measurements related to control protocol, RTP stream, and system packet statistics mibs.

#### AMS Control Protocol, RTP, packet statistics PMs

| OM Group or PM Name              | Name                                      | Description                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: AMS</b>      |                                           |                                                                                                                                                                                                                                                                                                                                                                          |
| acPerfMediaGateway (new in SN08) | acPerfCpNumDupsForCompletedTransactions   | <b>Number of Duplicated Completed Transactions:</b><br>The number of times a duplicate transaction request was received after the initial transaction had already been completed. In this case, the gateway resends the response for this transaction.                                                                                                                   |
|                                  | acPerfCpNumDupsForOutstandingTransactions | <b>Number of Duplicated Transactions Outstanding:</b><br>The number of times a duplicate transaction request was received while the initial transaction was outstanding, that is, still in progress. In this case, the gateway ignores the duplicate request.                                                                                                            |
|                                  | acPerfCpMessageSendsSuccesses             | <b>Messages Send Successes:</b><br>Number of times there was a success in sending a call control (H.248) message. Call control messages are sent using the system's socket library. This counter tracks successes in using the local socket services. It does not track successes in end-to-end message transfer between the gateway and the call agent.                 |
|                                  | acPerfCpMessageSendsErrors                | <b>Message Send Errors:</b><br>Number of times there was a failure in sending a call control (H.248) message. The message is sent via a datagram using the system's socket library. Normally a failure on a socket send operation would be attributed to an internal system problem.                                                                                     |
|                                  | acPerfCpMessageReceiveSuccesses           | <b>Message Receive Successes:</b><br>Number of times there was a success in receiving a call control (H.248) message. Call control messages are received using the system's socket library. This counter tracks successes in using the local socket services. It does not track successes in end-to-end message transfer between the gateway and the call agent.         |
|                                  | acPerfCpMessageReceiveErrors              | <b>Message Receive Errors:</b><br>Number of times there was a failure in receiving a call control(H.248) message. Call control messages are received using the system's socket library. A failure on the socket receive operation can be attributed to an internal system problem or with the call agent sending a message larger than what is supported by the gateway. |
|                                  | acPerfCpProtocolSyntaxErrors              | <b>Protocol Syntax Errors:</b><br>Number of syntax errors detected in incoming call control (H.248) messages.                                                                                                                                                                                                                                                            |

**AMS Control Protocol, RTP, packet statistics PMs**

| OM Group or PM Name | Name                                      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | acPerfCpMessageRetransmissions            | <b>Message Retransmissions:</b><br>Each time the call engine times out waiting for an acknowledgement it retransmits the control protocol message, unless the number of max retransmissions is exceeded. This counter is incremented each time a message is retransmitted due to a timeout.                                                                                                                                                                          |
|                     | acPerfCpMessageMaxRetransmissionsExceeded | <b>Message Max Re-transmissions Exceeded:</b><br>Number of times the call control message maximum retransmission count was exceeded. The gateway attempted several times to send a message to the call agent, but each time, an ack was not received. A failure of this type results in a failed call and is usually an indication that subsequent calls will fail. This problem is typically a result of the call agent being down or a result of a network problem |
|                     | acPerfCpMessagesFromUntrustedSources      | <b>Messages From Untrusted Sources:</b><br>Number of messages received from untrusted sources, that is from network nodes other than the node on which the call agent is running.                                                                                                                                                                                                                                                                                    |
|                     | acPerfRtpSenderPackets                    | <b>RTP Sender Packets (Card):</b><br>Total number of RTP packets sent by the system for this card.                                                                                                                                                                                                                                                                                                                                                                   |
|                     | acPerfRtpSenderOctets                     | <b>RTP Sending Octets (Card):</b><br>Total number of non-header RTP octets sent by this card.                                                                                                                                                                                                                                                                                                                                                                        |
|                     | acPerfRtpReceiverPackets                  | <b>RTP Receiver Packets (Card):</b><br>Total number of RTP packets received by the system for this card.                                                                                                                                                                                                                                                                                                                                                             |
|                     | acPerfRtpReceiverOctets                   | <b>RTP Receiver Octets (Card):</b><br>Total number of non-header RTP octets received by this card.                                                                                                                                                                                                                                                                                                                                                                   |
|                     | acPerfRtpRcvrLostPackets                  | <b>RTP Receiver Lost Packets (Card):</b><br>Total number of RTP packets lost as observed by this card.                                                                                                                                                                                                                                                                                                                                                               |
|                     | acPerfRtpFailedDueToLackOfResources       | <b>RTP Failed Due to Lack of Resources:</b><br>The number of times a rtp request was rejected due to lack of resources since the last application restart.                                                                                                                                                                                                                                                                                                           |
|                     | acPerfRtpSimplexInSessionsCurrent         | <b>RTP Simplex In Sessions:</b><br>Current number of simplex input RTP sessions.                                                                                                                                                                                                                                                                                                                                                                                     |
|                     | acPerfRtpSimplexOutSessionsTotal          | <b>RTP Simplex Out Session Total:</b><br>Total number of simplex output RTP sessions.                                                                                                                                                                                                                                                                                                                                                                                |
|                     | acPerfRtpSimplexOutSessionsCurrent        | <b>RTP Simplex Out Session Current:</b><br>Current number of simplex output RTP sessions                                                                                                                                                                                                                                                                                                                                                                             |
|                     | acPerfRtpDuplexSessionsTotal              | <b>RTP Duplex Sessions Total:</b><br>Total number of duplex RTP sessions.                                                                                                                                                                                                                                                                                                                                                                                            |

**AMS Control Protocol, RTP, packet statistics PMs**

| OM Group or PM Name | Name                           | Description                                                                                                                           |
|---------------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
|                     | acPerfRtpDuplexSessionsCurrent | <b>RTP Duplex Sessions Current:</b><br>Current number of duplex RTP sessions.                                                         |
|                     | acPerfSystemPacketEndpoints    | <b>System Packet Endpoints:</b><br>Number of endpoints reserved for all packet network-related functions (conferencing, plays, etc.). |

The second performance measurement mib is media server specific mib and contains statistics for these major categories:

- IVR – interactive voice response
- BCT – bearer channel tandeming
- CONF – Conferencing
- TT – Test Trunks

**AMS IVR, BCT, CONF, and IT PMs**

| OM Group or PM Name               | Name                                    | Description                                                                                                                                                                                                                  |
|-----------------------------------|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: AMS</b>       |                                         |                                                                                                                                                                                                                              |
| acPerfMediaServices (new in SN08) | acPerflvrPlayRequests                   | <b>Play Requests:</b><br>The total number of announcement requests received from the call agent                                                                                                                              |
|                                   | acPerflvrPlaySuccessful                 | <b>Play Successes:</b><br>Number of announcement requests processed successfully.                                                                                                                                            |
|                                   | acPerflvrPlayFailedDueToLackOfResources | <b>Play Failures Due to Lack of Resources:</b><br>Number of announcement requests which failed to be played because some resource was not available.                                                                         |
|                                   | acPerflvrPlayFailedDueToLackOfResources | <b>Play In Progress:</b><br>The number of announcement operations that are currently in progress.                                                                                                                            |
|                                   | acPerflvrPlayDuration                   | <b>Play Duration:</b><br>The duration, in seconds, of all successful announcement requests. The average duration of all requests (average hold time) can be computed by dividing acPerfPlayDuration by acPerfPlaySuccessful. |
|                                   | acPerflvrPlayFailedDueToProvMismatch    | <b>Play Failed Due to Provisioning Mismatch:</b><br>Number of audio segments which failed to be played because of a provisioning mismatch.                                                                                   |
|                                   | acPerflvrPlayCollectRequests            | <b>Play Collect Requests:</b><br>The number of play collect requests.                                                                                                                                                        |

**AMS IVR, BCT, CONF, and IT PMs**

| OM Group or PM Name | Name                                                | Description                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | acPerflvrPlayCollectSuccessful                      | <b>Play Collect Successful:</b><br>Number of play collects completed successfully. A request is considered successful if the entire sequence, from initial prompt to success/failure prompt, is played out without a failure due to lack of resources, provisioning mismatch, or any other media server failure. The failure of the user to enter the proper digits is not a reason for failure of the request. |
|                     | acPerflvrPlayCollectFailedDueToLackOfResources      | <b>Play Collect Failure due to Lack of Resources:</b><br>The number of play collect requests that failed due to lack of resources.                                                                                                                                                                                                                                                                              |
|                     | acPerflvrPlayCollectFailedDueToProvMismatch         | <b>Play Collect Failed Due to Provisioning Mismatches:</b><br>The number of play collect requests that failed due a provisioning mismatch.                                                                                                                                                                                                                                                                      |
|                     | acPerflvrPlayCollectInProgress                      | <b>Play Collect In Progress:</b><br>The number of play collect operations that are currently in progress.                                                                                                                                                                                                                                                                                                       |
|                     | acPerflvrPlayCollectDuration                        | <b>Play Collect Duration in Seconds:</b><br>The duration, in seconds, of all successful play collect requests. The average duration of all requests can be computed by dividing acPlayCollectDuration by acPlayCollectSuccessful.                                                                                                                                                                               |
|                     | acPerflvrContDigitCollectRequests                   | <b>Number of Continuous Digit Collection Requests:</b><br>The number of continuous digit collect requests.                                                                                                                                                                                                                                                                                                      |
|                     | acPerflvrContDigitCollectSuccessful                 | <b>Number of Continuous Digit Collect Requests Successful:</b><br>Number of continuous digit collects completed successfully.                                                                                                                                                                                                                                                                                   |
|                     | acPerflvrContDigitCollectFailedDueToLackOfResources | <b>Number of Continuous Digit Collection request failed (no resources):</b><br>The number of continuous digit collect requests that failed due to lack of resources.                                                                                                                                                                                                                                            |
|                     | acPerflvrContDigitCollectInProgress                 | <b>In Progress Continuous Digit Collection requests:</b><br>The number of continuous digit collect operations that are currently in progress.                                                                                                                                                                                                                                                                   |
|                     | acPerflvrContDigitCollectDuration                   | <b>Successful Continuous Digit Collect Requests:</b><br>The duration, in seconds, of all successful continuous digit collect requests. The average duration of all requests can be computed by dividing acDCCollectDuration by acDCCollectSuccessful.                                                                                                                                                           |
|                     | acPerfBctRequests                                   | <b>Total BCT Requests:</b><br>The total number of BCT contexts opened since the media server initialized.                                                                                                                                                                                                                                                                                                       |
|                     | acPerfBctSuccessful                                 | <b>Successful BCT requests:</b><br>Number of BCT requests processed successfully.                                                                                                                                                                                                                                                                                                                               |

**AMS IVR, BCT, CONF, and IT PMs**

| OM Group or PM Name | Name                                    | Description                                                                                                                                                                                                  |
|---------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | acPerfBctFailedDueToLackOfResources     | <b>Failed BCT requests:</b><br>Number of BCT requests which failed to be played because a resource was not available.                                                                                        |
|                     | acPerfBctInProgress                     | <b>In progress BCT requests:</b><br>The number of BCT calls that are currently in progress.                                                                                                                  |
|                     | acPerfBctDuration                       | <b>Duration of BCT contexts:</b><br>The duration, in seconds, of all successful BCT contexts. The average duration of all contexts can be computed by dividing acPerfBCTDuration by acPerfBCTSuccessful.     |
|                     | cPerfBctTotalParticipants               | <b>Total of BCT participants:</b><br>The total number of BCT participants since the media server initialized.                                                                                                |
|                     | acPerfBctCurrentNumberOfParticipants    | <b>In progress BCT participants:</b><br>The number of participants in all BCT calls that are currently in progress.                                                                                          |
|                     | acPerfConfRequests                      | <b>Total number of conferences processed:</b><br>The total number of conferences processed since the last application restart. This is the number of conferences created and not the number of members.      |
|                     | acPerfConfSuccessful                    | <b>Successful Conferences:</b><br>Number of conference requests processed successfully.                                                                                                                      |
|                     | acPerfConfInProgress                    | <b>In-progress Conferences:</b><br>The number of conferences currently in progress.                                                                                                                          |
|                     | acPerfConfDuration                      | <b>Conference Duration:</b><br>The duration, in seconds, of all successful conference requests. The average duration of all requests can be computed by dividing acPerfConfDuration by acPerfConfSuccessful. |
|                     | acPerfConfFailedDueToLackOfResources    | <b>Conference Failures due to lack of resources:</b><br>The number of times a conference request was rejected due to lack of resources since the last application restart.                                   |
|                     | acPerfConfAddRequests                   | <b>Requests to add a conferee:</b><br>The number of requests to add a conferee to an existing conference.                                                                                                    |
|                     | acPerfConfAddSuccessful                 | <b>Conferee adds successful:</b><br>The number of times a conferee was added successful to an existing conference.                                                                                           |
|                     | acPerfConfAddFailedDueToLackOfResources | <b>Conferee Add Failures due to lack of resources:</b><br>The number of times a conferee could not be added to an existing conference due to a lack of resources.                                            |



**AMS IVR, BCT, CONF, and IT PMs**

| OM Group or PM Name | Name                               | Description                                                                                                                                                                                                                                                                                    |
|---------------------|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | acPerfConfPlays                    | <b>Plays into Conference:</b><br>The total number of plays made into conferences since the last application restart.                                                                                                                                                                           |
|                     | acPerfConfPlayCollects             | <b>Play Collects in Conference:</b><br>The total number of play collects made into conferences since the last application restart.                                                                                                                                                             |
|                     | acPerfConfTones                    | <b>Play Tones into conference:</b><br>The total number of Tones played into conferences since the last application restart.                                                                                                                                                                    |
|                     | acPerfConfPortsUsed                | <b>Conference Ports Reserved:</b><br>The total number of ports that were reserved for conferences since the last application restart.                                                                                                                                                          |
|                     | acPerfConfPortsReserved            | <b>Conference Port Reserved for monitor:</b><br>A monitor port may be reserved by the call agent when setting up a conference. The monitor port can then be used by one or more listen-only conferees.                                                                                         |
|                     | acPerfTtRequests                   | <b>Test Trunk Test Requests:</b><br>The number of test trunk tests requested.                                                                                                                                                                                                                  |
|                     | acPerfTtSuccessful                 | <b>Test Trunk Test Request Successes:</b><br>The number of test trunk tests that were successfully setup and torn down. This PM is not a reflection on whether the test actually passed or failed.                                                                                             |
|                     | acPerfTtInProgress                 | <b>In-Progress Test Trunk Tests:</b><br>The number of test trunk tests that are currently in progress                                                                                                                                                                                          |
|                     | acPerfTtDuration                   | <b>Test Trunk Test Duration:</b><br>The duration, in seconds, of all successful test trunk requests. This number is the time between a test trunk test being initiated and completed. The average duration of all requests can be computed by dividing acPerfTtDuration by acPerfTtSuccessful. |
|                     | acPerfTtFailedDueToLackOfResources | <b>Test Trunk failures due to lack of resources:</b><br>The number of times a test trunk request was rejected due to lack of resources since the last application restart.                                                                                                                     |

**CICM PMs**

CICM Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format. The CICM Performance reference NTP is NN10248-711.

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms. The CICM uses one MIB, nortelPerfRefMIB.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

### **Ethernet Routing Switch 8600 (formerly Passport 8600) PMs**

ERS8600 Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format.

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

For information on performance measurements (PMs) available for the Media Gateway 15000 (previously PVG) network element, refer to Appendix G in this document, *Ethernet Routing Switch 8600 Trap List*.

### **GWC Performance Measurements**

GWC Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format. The GWC uses 4 MIBs: GWC-UNIT-STATUS-MIB, GWC-DPT-SERVICES-PM-MIB, RFC1213-MIB, and HOST-RESOURCES-MIB (RFC2790).

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

For more detailed information, refer to NN10208-711, Gateway Controller Performance Management. The following table lists the GWC performance measurements.

### GWC Performance Measurements

| OIDs                                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The GWC supports collection of a subset of several MIBs. The following table entries show the OIDs that are collected in various categories. |                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Host-Resources-MIB</b>                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                     |
| host(25).hrSystem(1)                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                     |
| 25.1.hrSystemUptime(1)                                                                                                                       | System Uptime (distinct from sysUpTime)                                                                                                                                                                                                                                                                                                                             |
| 25.1.hrSystemDate(2)                                                                                                                         | System local DateAndTime                                                                                                                                                                                                                                                                                                                                            |
| 25.1.hrSystemInitialLoadParameters(4)                                                                                                        | Load path/parameters used                                                                                                                                                                                                                                                                                                                                           |
| 25.1.hrSystemNumUsers(5)                                                                                                                     | Current number of "user sessions"                                                                                                                                                                                                                                                                                                                                   |
| 25.1.hrSystemProcesses(6)                                                                                                                    | Number of tasks                                                                                                                                                                                                                                                                                                                                                     |
| 25.1.hrSystemMaxProcesses(7)                                                                                                                 | Maximum number of tasks                                                                                                                                                                                                                                                                                                                                             |
| host(25).hrStorage(2)                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                     |
| 25.2.hrMemorySize(2)                                                                                                                         | Main memory DRAM size (KBytes)                                                                                                                                                                                                                                                                                                                                      |
| 25.2.hr.StorageTable(3)                                                                                                                      | Table describing storage and resource areas, including for each: Type, Description, AllocationUnits, Size, Used, and AllocationFailures.<br>An entry in this table is planned for each of the resources currently registered in the Base Resource Monitor:<br>- System Heap<br>- VRTX Workspace<br>- Segment Descriptors<br>- IPC Buffers<br>- Ethernet DCU Buffers |
| host(25).hrDevice(3)                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                     |
| 25.3.hrDeviceTable(2)                                                                                                                        | Table of hardware devices contained in host, including for each: Type, Description, "ID", Status, and Error counts.<br>An entry is planned in this table for each of the devices listed on the PCI bus, plus the CPU.                                                                                                                                               |
| 25.3.hrProcessorTable(3)                                                                                                                     | Table of info on processors for this host, including a FirmwareID and CPU-Load (1min).<br>There will be an entry for each processor in the hrDeviceTable (just 1 for now).                                                                                                                                                                                          |

**GWC Performance Measurements**

| <b>OIDs</b>                       | <b>Description</b>                                                                                                                                                       |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 25.hrSWRun(4)                     |                                                                                                                                                                          |
| 25.4.hrSWOSIndex(1)               | Index of the entry in the following table for the OS.                                                                                                                    |
| 25.4.hrSWRunTable(2)              | Table of software running on the host, and for each host, a Name, ProductID, Run Path and Parameters, Type, and Status. Status is implemented as READ-ONLY.              |
| 25.hrSWRunPerf(5)                 |                                                                                                                                                                          |
| 25.5.hrSWRunPerfTable(1)          | Table of performance data for software in the hrSWRun table, which includes for each task the CPU and memory usage CPU and memory usage for each task that is available. |
| <b>RFC1213-MIB</b>                |                                                                                                                                                                          |
| sysDescr                          |                                                                                                                                                                          |
| snmpInPkts                        |                                                                                                                                                                          |
| snmpOutPkts                       |                                                                                                                                                                          |
| snmpInBadVersions                 |                                                                                                                                                                          |
| snmpInBadCommunityNames           |                                                                                                                                                                          |
| snmpInBadCommunityUses            |                                                                                                                                                                          |
| snmpInASNParseErrs                |                                                                                                                                                                          |
| snmpInTotalReqVars                |                                                                                                                                                                          |
| snmpInTotalSetVars                |                                                                                                                                                                          |
| snmpOutTraps                      |                                                                                                                                                                          |
| snmpSilentDrops                   |                                                                                                                                                                          |
| <b>Unit Status-MIB</b>            |                                                                                                                                                                          |
| norUnitAdminStatus                |                                                                                                                                                                          |
| norUnitOperStatus                 |                                                                                                                                                                          |
| norUnitActivity                   |                                                                                                                                                                          |
| <b>DPT Services PM-MIB</b>        |                                                                                                                                                                          |
| dptCallAttempts                   |                                                                                                                                                                          |
| <b>GWC Performance Statistics</b> |                                                                                                                                                                          |

**GWC Performance Measurements**

| OIDs | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | <p>The following are reported through the GWC Performance MIB:</p> <ul style="list-style-type: none"><li>• Small GWs in Disabled State</li><li>• Large GWs in Disabled State</li><li>• Trunk GWs in Disabled State</li><li>• Audio GWs in Disabled State</li><li>• Total Gateways Provisioned</li><li>• DNS failed GW discovery</li><li>• DNS good GW discovery</li><li>• RSIP used in GW discovery</li><li>• Total DNS GWs to discover</li><li>• USP SS7 paths disabled</li><li>• USP SS7 path not Active</li><li>• Peer connections failed during interval</li><li>• Peer connections completed during interval</li><li>• Peer connections attempted during interval</li></ul> |

**GWC Performance Measurements**

| OIDs                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>GWC Performance Statistics</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Media Proxy OMs                   | <p>The following are reported through the GWC Performance MIB:</p> <ul style="list-style-type: none"><li>• Number of provisioned Media Proxies counts the number of currently provisioned media proxies on the GWC each 5-minute period.</li><li>• Media Proxy 5 minute successful calls counts the number of calls that were successfully setup using this Media Proxy on this GWC in the last 5 minute OM period.</li><li>• Media Proxy 30 minute successful calls counts the number of calls that were successfully setup using this Media Proxy on this GWC in the last 30 minute period.</li><li>• Media Proxy 5 minute failed calls counts the number of failed attempts to setup a call using this Media Proxy on this GWC in the last 5 minute OM period.</li><li>• Media Proxy 30 minute failed calls counts the number of failed attempts to setup a call using this Media Proxy on this GWC in the last 30 minute period.</li><li>• GWC 5 minute successful calls counts the number of calls that were successfully setup using any available Media Proxy on this GWC in the last 5 minute OM period.</li><li>• GWC 30 minute successful calls counts the number of calls that were successfully setup using any available Media Proxy on this GWC in the last 30 minute period.</li><li>• GWC 5 minute failed calls counts the number of failed attempts to setup a call on any available Media Proxy on this GWC in the last 5 minute OM period.</li><li>• GWC 30 minute failed calls counts the number of failed attempts to setup a call on any available Media Proxy on this GWC in the last 30 minute period.</li></ul> |

## IEMS Performance Measurements

The following table lists the performance measurements (PMs) collected by the Integrated Element Management System.

| Collection Attribute Name                 | Description                                                         |
|-------------------------------------------|---------------------------------------------------------------------|
| <b>Network Element: IEMS</b>              |                                                                     |
| database                                  | usedTableSpaceInBytes                                               |
|                                           | usedTableSpaceInPercent                                             |
|                                           | numOfTableCleanUpPolicyExecutions                                   |
| fault/events                              | numOfEvents                                                         |
|                                           | numOfEventsFromUnknownCustlogDevices                                |
|                                           | numOfEventsFromUnknownDevices                                       |
|                                           | numOfDiscardedEvents                                                |
|                                           | numOfEventsAdded                                                    |
|                                           | eventQueueSize                                                      |
|                                           | avgEventThroughputRate                                              |
|                                           | maxEventThroughputRate                                              |
|                                           | DeviceEventRateTable<br>This table will have the following columns: |
|                                           | - ID                                                                |
| fault/alarms                              | - DeviceName                                                        |
|                                           | - EventRate per Second                                              |
|                                           | numOfActiveAlarms                                                   |
|                                           | numOfCriticalAlarms                                                 |
|                                           | numOfMajorAlarms                                                    |
|                                           | numOfMinorAlarms                                                    |
|                                           | numOfWarningAlarms                                                  |
|                                           | numOfAlarmsCleared                                                  |
|                                           | numOfAlarmsAdded                                                    |
|                                           | numOfCollectionJobsProvisioned                                      |
| performance                               | numOfReportJobsProvisioned                                          |
|                                           | numOfFailedReportJobs                                               |
|                                           | numOfTransferJobProvisioned                                         |
|                                           | numOfAttributesCollected                                            |
|                                           | numOfAttributesCollectedOverPreviousInterval                        |
| performance/Successful<br>Collection Jobs | numOf5MinSuccessfulJobs                                             |
|                                           | numOf15MinSuccessfulJobs                                            |
|                                           | numOf30MinSuccessfulJobs                                            |
|                                           | numOf60MinSuccessfulJobs                                            |
|                                           | numOf12HrSuccessfulJobs                                             |
|                                           | numOf24HrSuccessfulJobs                                             |

| Collection Attribute Name                      | Description                                |
|------------------------------------------------|--------------------------------------------|
| performance/Partial Successful Collection Jobs | numOf5MinPartialSuccessfulJobs             |
|                                                | numOf15MinPartialSuccessfulJobs            |
|                                                | numOf30MinPartialSuccessfulJobs            |
|                                                | numOf60MinPartialSuccessfulJobs            |
|                                                | numOf12HrPartialSuccessfulJobs             |
|                                                | numOf24HrPartialSuccessfulJobs             |
| performance/Failed Collection Jobs             | numOf5MinFailedJobs                        |
|                                                | numOf15MinFailedJobs                       |
|                                                | numOf30MinFailedJobs                       |
|                                                | numOf60MinFailedJobs                       |
|                                                | numOf12HrFailedJobs                        |
|                                                | numOf24HrFailedJobs                        |
| performance/Collection Job Table               | 5MinCollectionJobTable                     |
|                                                | This table will have the following columns |
|                                                | - ID                                       |
|                                                | - JobName                                  |
|                                                | - Start Time                               |
|                                                | - Execution Time                           |
| performance/report Job Table                   | 15MinCollectionJobTable                    |
|                                                | 30MinCollectionJobTable                    |
|                                                | 60MinCollectionJobTable                    |
|                                                | 5MinReportJobTable                         |
|                                                | 15MinReportJobTable                        |
|                                                | 30MinReportJobTable                        |
| performance/failedTransfer Jobs                | 60MinReportJobTable                        |
|                                                | numOf5MinFailedJobs                        |
|                                                | numOf15MinFailedJobs                       |
|                                                | numOf30MinFailedJobs                       |
|                                                | numOf60MinFailedJobs                       |
|                                                | numOf12HrFailedJobs                        |
| performance/transfer Job Table                 | numOf24HrFailedJobs                        |
|                                                | 5MinTransferJobTable                       |
|                                                | 15MinTransferJobTable                      |
|                                                | 30MinTransferJobTable                      |
|                                                | 60MinTransferJobTable                      |
|                                                | 30MinReportJobTable                        |
| topology                                       | 60MinReportJobTable                        |
|                                                | numOfManagedObjects                        |



| Collection         | Attribute Name                         | Description |
|--------------------|----------------------------------------|-------------|
| client             | numOfAddedManagedObjects               |             |
|                    | numOfDeletedManagedObjects             |             |
|                    | numOfThrottledDevices                  |             |
|                    | numOfUnManagedDevices                  |             |
|                    | numOfUnknownDevices                    |             |
|                    | numOfActiveClients                     |             |
|                    | numOfSuccessfulLogins                  |             |
| application memory | numOfFailedLoginAttempts               |             |
|                    | applicationHeapSize                    |             |
|                    | maxApplicationHeapSizeInAGivenInterval |             |
| system             | systemRestartCount                     |             |

### MCS, RTP Media Portal, and MAS Performance Measurements

For information on performance measurements (PMs) available for these network elements, refer to the following documents:

- NN10384-700, *MCS 5200 Performance Management*
- NN10367-111, *CVoIP RTP Media Portal Basics*
- NN10303-111, *MAS Meetme Basics*

### MG 9000 Performance Measurements

MG9K Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format.

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

For more information on MG9000 PMs, refer to NN10140-711, *MG 9000 Performance Management* and Appendix B of this document, *MG 9000 MIB*

*OMs/PMs*. That appendix, together with the following table, list the MG 9000 performance measurements.

### MG 9000 Performance Measurements

| OM Group or<br>PM Name             | Registers                                                                           | Description                                                                                                           |
|------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: MG 9000</b>    |                                                                                     |                                                                                                                       |
| <b>Ethernet OMs</b>                |                                                                                     |                                                                                                                       |
|                                    | Number of Alignment Errors                                                          |                                                                                                                       |
|                                    | Number of FCS Errors                                                                |                                                                                                                       |
|                                    | Number of Internal MAC Receive Errors                                               |                                                                                                                       |
|                                    | Number of Frame Too Longs                                                           |                                                                                                                       |
|                                    | Number of Internal MAC TX Errors                                                    |                                                                                                                       |
|                                    | Number of Symbol Errors                                                             |                                                                                                                       |
|                                    | Number of Inpause Frames                                                            |                                                                                                                       |
|                                    | Number of Outpause Frames                                                           |                                                                                                                       |
|                                    | Number of Drop Events                                                               |                                                                                                                       |
|                                    | Number of Broadcast Packets                                                         |                                                                                                                       |
|                                    | Number of Multicast Packets                                                         |                                                                                                                       |
|                                    | Number of CRC Alignment Errors                                                      |                                                                                                                       |
|                                    | Number of Undersize Packets                                                         |                                                                                                                       |
|                                    | Number of Oversize Packets                                                          |                                                                                                                       |
|                                    | Number of Fragments                                                                 |                                                                                                                       |
|                                    | Number of Jabbers                                                                   |                                                                                                                       |
|                                    | Number of Collisions                                                                |                                                                                                                       |
| <b>GWOVL0M</b>                     | This OM group will be incremented for every call connection request that is denied. |                                                                                                                       |
|                                    | OVERLOAD                                                                            | This register is incremented when a Media Gateway 9000 reaches an overload threshold and call connections are denied. |
| <b>MG9K Performance Statistics</b> |                                                                                     |                                                                                                                       |
|                                    | Errored Seconds                                                                     |                                                                                                                       |
|                                    | Severely Errored Seconds                                                            |                                                                                                                       |
|                                    | Unavailable Seconds                                                                 |                                                                                                                       |
|                                    | Optical Power Transmit                                                              |                                                                                                                       |
|                                    | Optical Power Receive                                                               |                                                                                                                       |
|                                    | Transmit Bias Current                                                               |                                                                                                                       |
|                                    | Temperature                                                                         |                                                                                                                       |
|                                    | Voltage                                                                             |                                                                                                                       |

**MG 9000 Performance Measurements**

| OM Group or PM Name                                                                                                             | Registers                          | Description                                                               |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------|---------------------------------------------------------------------------|
| <b>MG9K GIGE OM Statistics</b> MG9K EM performance strategy where the data is collected in 15 or 5/30 minutes for 96 intervals. |                                    |                                                                           |
|                                                                                                                                 | Errored Seconds                    | Counter for Errored Seconds                                               |
|                                                                                                                                 | Severely Errored Seconds           | Counter for Severely Errored Seconds                                      |
|                                                                                                                                 | Unavailable Seconds                | Counter for Unavailable Seconds                                           |
|                                                                                                                                 | Optical Power Transmit             | Optical Power Transmit                                                    |
|                                                                                                                                 | Optical Power Receive              | Counter for Optical Power Receive                                         |
|                                                                                                                                 | Transmit Bias Current              | Counter for Transmit Bias Current                                         |
|                                                                                                                                 | Temperature                        | Counter for Temperature                                                   |
| <b>RMON Performance Measurements</b>                                                                                            |                                    |                                                                           |
|                                                                                                                                 | Drop Events                        | The current data associated with etherStatsDropEvents.                    |
|                                                                                                                                 | Broadcast Packets                  | The counter data associated with etherStatsBroadcastPkts.                 |
|                                                                                                                                 | Multicast Packets                  | The counter associated with etherStatsMulticastPkts.                      |
|                                                                                                                                 | CRC Alignment Errors               | The counter associated with etherStatsCRCAlignErrors.                     |
|                                                                                                                                 | Undersize Packets                  | The counter associated with etherStatsUndersizePkts.                      |
|                                                                                                                                 | Oversize Packets                   | The counter associated with etherStatsOversizePkts.                       |
|                                                                                                                                 | Fragments                          | The counter associated with etherStatsFragments.                          |
|                                                                                                                                 | Jabbers                            | The counter associated with etherStatsJabbers.                            |
|                                                                                                                                 | Collisions                         | The counter associated with etherStatsCollisions.                         |
| <b>RMON HC Performance Measurements</b>                                                                                         |                                    |                                                                           |
|                                                                                                                                 | HC overflow packets                | The counter associated with HC Overflow Packets.                          |
|                                                                                                                                 | Packets received                   | The counter associated with number of packets received.                   |
|                                                                                                                                 | Overflow octets                    | The counter associated with HC number of Overflow octets.                 |
|                                                                                                                                 | Octets of data received            | The counter associated with number of octets of data received.            |
|                                                                                                                                 | Total HC Octets                    | The counter associated with Total Number of HC Octets.                    |
|                                                                                                                                 | Total non unicast packets          | The counter associated with Total number of non unicast packets.          |
|                                                                                                                                 | Total non unicast HC octets        | The counter associated with Total number of non unicast HC octets.        |
|                                                                                                                                 | Total non unicast octets           | The counter associated with Total number of non unicast octets.           |
|                                                                                                                                 | Total non unicast over flow octets | The counter associated with Total number of non unicast over flow octets. |
|                                                                                                                                 | Total non unicast HC octets        | The counter associated with Total number of non unicast HC octets.        |

**MG 9000 Performance Measurements**

| OM Group or PM Name                  | Registers                                            | Description                                                              |
|--------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------|
| <b>SMON MIB table</b>                |                                                      |                                                                          |
|                                      | smonVlanIdStatsTotalPkts                             | Total incoming packets.                                                  |
|                                      | smonVlanIdStatsTotalHCPkts                           | Total outgoing packets.                                                  |
|                                      | smonVlanIdStatsTotalOctets                           | Total incoming octets.                                                   |
|                                      | smonVlanIdStatsTotalHCOctets                         | Total outgoing octets.                                                   |
| <b>SMON Performance Measurements</b> |                                                      |                                                                          |
|                                      | VLAN ID                                              | The VLAN ID.                                                             |
|                                      | Total Packets                                        | The counter associated with Total number Packets.                        |
|                                      | Total HC Packets                                     | The counter associated with Total Number of HC Packets.                  |
|                                      | Create time                                          | The Create time.                                                         |
|                                      | Total Octets                                         | The counter associated with Total Number of Octets.                      |
|                                      | Total HC octets                                      | Displays the total number of HC octets.                                  |
|                                      | Total overflow packets                               | Displays the total number of overflow packets.                           |
|                                      | Total overflow octets                                | Displays the total number of overflow octets.                            |
|                                      | Total non unicast packets                            | The counter associated with Total number of non unicast packets.         |
|                                      | Total non unicast HC octets                          | The counter associated with Total number of non unicast HC octets.       |
|                                      | Total non unicast octets                             | The counter associated with Total number of non unicast octets.          |
|                                      | Total non unicast overflow octets                    | The counter associated with Total number of non unicast overflow octets. |
|                                      | Total non unicast HC octets                          | The counter associated with Total number of non unicast HC octets.       |
| <b>SMON Performance</b>              |                                                      |                                                                          |
|                                      | smonVlanIdStatsTotalPkts - total incoming packets    |                                                                          |
|                                      | smonVlanIdStatsTotalHCPkts - total outgoing packets  |                                                                          |
|                                      | smonVlanIdStatsTotalOctets - total incoming octets   |                                                                          |
|                                      | smonVlanIdStatsTotalHCOctets - total outgoing octets |                                                                          |

## Media Gateway 15000 OMs/PMs and Passport 15000/Multiservice Switch OMs/PMs

**Note:** For SN08, the terms Packet Voice Gateway (PVG) and Passport 15000 have been rebranded as part of Nortel Networks' brand simplified naming format. The PVG is now referred to as Nortel Networks Media Gateway 15000. The Passport 15000 is now referred to as the Nortel Networks Multiservice Switch 15000.

Performance measurements for MSS 7400, 15000, 20000 are available only from the MDM directly. For details on Media Gateway 15000 and Multiservice Switch 15000 performance measurements, refer to NTP NN10158-711, *MSS 15000, MG 15000 & MDM Performance*.

In SN08, the 5- and 30-minute performance measurements (PMs) now provide Internet protocol (IP) statistics. The IP statistics are available at a physical interface level. You can use IP statistics for operational monitoring and for network planning and engineering. Also, you can obtain performance information from IP statistics, such as link bandwidth utilization, voice call volumes, and error conditions. These are key for monitoring the network using PMs. Within the Multiservice Switch, performance measurements (PMs) are referred to as network traffic management (NTM) statistics.

IP interface statistics apply to all physical interfaces on Nortel Networks Multiservice Switch 15000 nodes that process layer 3 IP. This includes ports on the Ethernet-based Gigabit Ethernet (GE) function processors (FPs), the control processor (CP) operations, administration, and maintenance (OAM) Ethernet port, and the asynchronous transfer mode (ATM)-based OC-3, OC-12 and DS3 ports. PMs for these nodes now include an expanded range of values.

### Statistics collection and data flow

The data collection system (DCS) on the node collects NTM statistics from the control and function processors, and ATM and IP interfaces, at 5-minute intervals. To collect the statistics, the DCS uses a real-time statistics stream (rtstats). Each node forwards these records to Nortel Networks Multiservice Data Manager (MDM) servers.

On Nortel Networks Multiservice Data Manager (MDM) servers, the Performance Measurements Stream Processor (PMSP) server application manages performance. NTM statistics originating from node processors flow to the PMSP server application. The PMSP server application converts the statistics into ASCII comma separated value (CSV) formatted 5-minute records. It also creates 30-minute data records by aggregating six 5-minute data records. These are referred to as 5-minute and 30-minute performance measurements (PMs).

The MDM servers transfer the NTM data directly to the OSS applications, or to the CS2000 Core Manager running on the SDM, depending on the network configuration.

### Accessing files through the SDM or MDM

**Note:** Access via SDM is not generally available for Media Gateway 15000 (previously PVG) performance measurements.

NTM statistics data can be configured to be obtained from the SuperNode Data Manager (SDM). The PM file follows the file naming conventions of the Operational Measurement Delivery (OMD) application. The format of the file name is:

`<name>.<date>.<time>.PP.<type>.CSV`

The collected NTM statistics files are stored in the /omdata/closedNotSent directory. They are now available to the OSS application. The OSS application retrieves the files and moves them to the /omdata/closedSent directory. Upon the transfer of the files, the OMD automatically sets the retention period for the files. The retention period for a file can be configured using the OMUI. It can range from one to fourteen days.

When NTM statistics data is configured to be obtained from Nortel Networks Multiservice Data Manager (MDM) servers, the name of the file is similar to that used by SDM. However, the Host Group Directory Server (HGDS) group name or shelf name indicating the source of the NTM statistics data replaces the “PP” string found after the time stamp in the SDM file name. The format for the file name appears below.

`<name>.<date>.<time>.<HGDS group or shelf name>.<type>.CSV`

### PMs for Media Gateway 15000

Performance measurements for MSS 7400, 15000, 20000 are available only from the MDM directly. For details on Media Gateway 15000 and Multiservice Switch 15000 performance measurements, refer to NTP NN10158-711, *MSS 15000, MG 15000 & MDM Performance*

### MS 2000 Series Node OMs/PMs

MS 2000 Series Node Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format.

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

Refer to NN10300-100, *IP Solutions Basics*.

### **NGSS-Trunks OMs/PMs**

NGSS-Trunks Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format.

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

For details, refer to NN10342-711, *Session Server Performance Management*.

### **SAM21 OMs/PMs**

The SAM21 EM has no operational or performance measurements for IP solutions.

### **Session Server Manager OMs/PMs**

Refer to NN10342-711, *Session Server Manager Performance Management*.

## SSPFS OMs/PMs

SPFS is the base OAM&P Server application. The following servers use SPFS on N240s: CBM, CMT, IEMS, MG9KEM. SSPFS Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format. The SSPFS Performance reference NTP is NN10150-711.

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

The SPFS uses 2 MIBs (RFC1213 and SUN-SNMP). Each MIB will contain the following layout including the MIB name, MIB table, Entry Name, and PM-ID Name, Syntax, and description.

## STORM OMs/PMs

STORM Performance Measurement data files are stored in predetermined paths on the IEMS server. For SN08+, IEMS polls (via SNMP) the PM data and converts the data into XML or CSV format. Refer to NN10054-711, *STORM Performance Management* for more details

MIB input data files are found at: /opt/nortel/iems/current/mibs. The OM CSV output data files are in: /data/oms.

The /data/oms directory will contain 7 sub-directories (named 1-7). Each of these sub-directories contains a day's collection of CSV output files. The current day's output file are always written in subdirectory '1'. File rotation occurs just prior to midnight every 24 hour period. When rotation occurs, sub-directory '7' contents are removed and then sub-directories 1-6 are moved up a directory.

STORM uses two MIBs: RFC1213-MIB, and HOST-RESOURCES-MIB (RFC2790).



## UAS OMs/PMs

The following table lists the operational measurements (OMs) and performance measurements (PMs) available for the UAS network element. UAS supports XML and CSV format. For details, refer to NN10139-001, *UAS Performance*.

| OM group or PM name                     | Description                                                                                                                                                                                                                                                                                                                                                   |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Network Element: UAS</b>             |                                                                                                                                                                                                                                                                                                                                                               |
| CRC Count                               | A Minor alarm is raised when the CRC error count threshold is exceeded.                                                                                                                                                                                                                                                                                       |
| Plane Msg Count                         | A Minor alarm is raised when the plane message count threshold is exceeded.                                                                                                                                                                                                                                                                                   |
| norUasProtocolSyntaxErrors              | Number of syntax errors detected in incoming call control (MGCP, H.248) messages.                                                                                                                                                                                                                                                                             |
| norUasProtocolMessageValidationErrors   | Number of times an incoming call control (MGCP, H.248) message had valid syntax, but failed validation                                                                                                                                                                                                                                                        |
| norUasUdpSendErrors                     | Number of times there was a failure in sending a call control (MGCP, H.248) message. The message is sent via a datagram using the system's socket library. Normally a failure on a socket send operation would be attributed to an internal system problem.                                                                                                   |
| norUasUdpReceiveErrors                  | Number of times there was a failure in receiving a call control (MGCP, H.248) message. Call control messages are received using the system's socket library. A failure on the socket receive operation can be attributed to an internal system problem or with the call agent sending a message larger than what is supported by the gateway.                 |
| norUasMgcpMessageRetransmissions        | Number of retransmissions of media gateway control protocol messages. Media gateway control protocol is used in here in a generic sense to include both MGCP and H.248                                                                                                                                                                                        |
| norUasMgcpMessageRetransmissionFailures | Number of times a retransmitted media gateway control protocol message was not acknowledged. Media gateway control protocol is used in here in a generic sense to include both MGCP and H.248.                                                                                                                                                                |
| norUasAudioSegmentPlayed                | Number of successful attempts to play audio. For the current number of play attempts, see norUasCurrentNumberOfPlays.                                                                                                                                                                                                                                         |
| norUasAudioSegmentFailed                | <p>Number of failed attempts to play audio. Failures can occur for the following reasons:</p> <ul style="list-style-type: none"> <li>- call agent sent a bad audio segment id</li> <li>- the audio segment is not provisioned</li> <li>- there was an internal program error</li> </ul> <p>Examine the logs to determine the exact nature of the failure.</p> |

| OM group or PM name                     | Description                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| norUasAckfail                           | Number of negative acknowledgements (nacks) received. Nacks can be sent by the call agent in response to RSIP or NTFY messages.                                                                                                                                                                                                                                                                                  |
| norUasTimeout                           | Number of times the call engine timed out waiting for an acknowledgement.                                                                                                                                                                                                                                                                                                                                        |
| norUasProterror                         | Number of call control protocol errors detected. Typical reasons for these errors are: <ul style="list-style-type: none"> <li>- duplicate parameter</li> <li>- invalid range of parameter</li> <li>- mandatory parameter missing</li> </ul> Examine the logs to determine the exact nature of the failure.                                                                                                       |
| norUasRestart                           | Number of abnormal restarts of one of two critical threads in the call processing process. The two threads are the event state machine thread and the maintenance state machine thread. Examine the logs to determine which thread failed.                                                                                                                                                                       |
| norUasComperror                         | The number of times the call engine failed to build a response to a call agent message. Examine the logs to determine the exact nature of the failure.                                                                                                                                                                                                                                                           |
| norUasConndeleted                       | Number of times that the call engine receives a bad connection id from the call agent. This is normally a result of the call agent sending a message for a connection that has already been deleted.                                                                                                                                                                                                             |
| norUasCallControlMessageSendFailures    | Number of times the call control message maximum retransmission count was exceeded. The UAS attempted several times to send a message to the call agent, but each time, an ack was not received. A failure of this type results in a failed call and is usually an indication that subsequent calls will fail. This problem is typically a result of the call agent being down or a result of a network problem. |
| norUasEndpointsInUse                    | Number of endpoints that the call engine is currently using for all packet network-related functions (conferencing, plays, etc.).                                                                                                                                                                                                                                                                                |
| norUasNumDupsForCompletedTransactions   | The number of times a duplicate transaction request was received after the initial transaction had already been completed. In this case, the gateway resends the response for this transaction.                                                                                                                                                                                                                  |
| norUasNumDupsForOutstandingTransactions | The number of times a duplicate transaction request was received while the initial transaction was outstanding, that is, still in progress. In this case, the gateway ignores the duplicate request.                                                                                                                                                                                                             |
| norUasConfTotal                         | The total number of conferences processed since the last application restart.                                                                                                                                                                                                                                                                                                                                    |

| OM group or PM name                | Description                                                                                                        |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| norUasConfLackOfResourceRejections | The number of times a conference request was rejected due to lack of resources since the last application restart. |
| norUasConfPlays                    | The total number of plays made into conferences since the last application restart.                                |
| norUasRequestsFailed               | The number of resource requests for endpoints on this pool that failed.                                            |
| norUasNumberOfPlayRecords          | The total number of play record operations.                                                                        |
| norUasNumberOfPlayRecordErrors     | The total number of failed play record operations.                                                                 |

## USP OMs/PMs

### See Appendix D

Refer to Appendix D for a complete list of the operational measurements (OMs) and performance measurements (PMs) available for the USP network element. You may also refer to NN10137-711, *USP Performance Management* and NN1038-711, *USP-Compact Performance Management*.

USP supports SSV format. For details on this format, refer to the Performance section of the FCAPS documentation on USP, NN10137-711.

## Appendix A: Passport 8600 Performance Metrics

| <u>Performance Metric Identifier</u> | <u>MIB Name</u> | <u>Description</u>                                                                                                                                                                                                                                                                                                                                                                                                                              | <u>Default Succession<br/>IEMS Collection<br/>Interval</u> |
|--------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|
| <b>RFC1213-MIB</b>                   |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                            |
| sysDescr                             | RFC1213-MIB     | A textual description of the entity. This value should include the full name and version identification of the system's hardware type, software operating-system, and networking software. It is mandatory that this only contain printable ASCII characters.                                                                                                                                                                                   | Every 30 mins                                              |
| sysObjectID                          | RFC1213-MIB     | The vendor's authoritative identification of the network management subsystem contained in the entity. This value is allocated within the SMI enterprises subtree (1.3.6.1.4.1) and provides an easy and unambiguous means for determining 'what kind of box' is being managed. For example, if vendor 'Flintstones, Inc.' was assigned the subtree 1.3.6.1.4.1.4242, it could assign the identifier 1.3.6.1.4.1.4242.1.1 to its 'Fred Router'. | Every 30 mins                                              |
| sysUpTime                            | RFC1213-MIB     | The time (in hundredths of a second) since the network management portion of the system was last re-initialized.                                                                                                                                                                                                                                                                                                                                | Every 30 mins                                              |
| sysName                              | RFC1213-MIB     | An administratively-assigned name for this managed node. By convention, this is the node's fully-qualified domain name.                                                                                                                                                                                                                                                                                                                         | Every 30 mins                                              |
| sysLocation                          | RFC1213-MIB     | The physical location of this node (e.g., 'telephone closet, 3rd floor').                                                                                                                                                                                                                                                                                                                                                                       | Every 30 mins                                              |
| ifInOctets                           | RFC1213-MIB     | The total number of octets received on the interface, including framing characters.                                                                                                                                                                                                                                                                                                                                                             | Every 5 and 30 mins                                        |
| ifInDiscards                         | RFC1213-MIB     | The number of inbound packets which were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.                                                                                                                                                                                       | Every 30 mins                                              |
| ifInErrors                           | RFC1213-MIB     | The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.                                                                                                                                                                                                                                                                                                                          | Every 30 mins                                              |
| ifOutOctets                          | RFC1213-MIB     | The total number of octets transmitted out of the interface, including framing characters.                                                                                                                                                                                                                                                                                                                                                      | Every 5 and 30 mins                                        |
| ifOutDiscards                        | RFC1213-MIB     | The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.                                                                                                                                                                                                                 | Every 30 mins                                              |
| ifOutErrors                          | RFC1213-MIB     | The number of outbound packets that could not be transmitted because of errors.                                                                                                                                                                                                                                                                                                                                                                 | Every 30 mins                                              |
| ipInReceives                         | RFC1213-MIB     | The total number of input datagrams received from interfaces, including those received in error.                                                                                                                                                                                                                                                                                                                                                | Every 5 and 30 mins                                        |
| ipInDiscards                         | RFC1213-MIB     | The number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (e.g., for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.                                                                                                                                                                           | Every 30 mins                                              |
| ipOutRequests                        | RFC1213-MIB     | The total number of IP datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission. Note that this counter does not include any datagrams counted in ipForwDatagrams.                                                                                                                                                                                                                                  | Every 5 and 30 mins                                        |
| ipOutDiscards                        | RFC1213-MIB     | The number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (e.g., for lack of buffer space). Note that this counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.                                                                                                                 | Every 30 mins                                              |
| <b>RFC1271-MIB</b>                   |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                            |
| etherStatsCRCAlignErrors             | RFC1271-MIB     | The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but were not an integral number of octets in length or had a bad Frame Check Sequence (FCS).                                                                                                                                                                                                | Every 30 mins                                              |

| <u>Performance Metric Identifier</u> | <u>MIB Name</u>    | <u>Description</u>                                                                                                                                                                                                                                                   | <u>Default Succession</u> |
|--------------------------------------|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
|                                      |                    |                                                                                                                                                                                                                                                                      | <u>Interval</u>           |
| etherStatsUndersizePkts              | RFC1271-MIB        | The total number of packets received that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed.                                                                                                           | Every 30 mins             |
| etherStatsOversizePkts               | RFC1271-MIB        | The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed.                                                                                                            | Every 30 mins             |
| etherStatsFragments                  | RFC1271-MIB        | The total number of packets received that were not an integral number of octets in length or that had a bad Frame Check Sequence (FCS), and were less than 64 octets in length (excluding framing bits but including FCS octets).                                    | Every 30 mins             |
| etherStatsJabbers                    | RFC1271-MIB        | The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and were not an integral number of octets in length or had a bad Frame Check Sequence (FCS).                                              | Every 30 mins             |
| etherStatsCollisions                 | RFC1271-MIB        | The best estimate of the total number of collisions on this Ethernet segment.                                                                                                                                                                                        | Every 30 mins             |
| etherHistoryCRCAlignErrors           | RFC1271-MIB        | The number of packets received during this sampling interval that had a length (excluding framing bits but including FCS octets) between 64 and 1518 octets, inclusive, but were not an integral number of octets in length or had a bad Frame Check Sequence (FCS). | Every 30 mins             |
| etherHistoryUndersizePkts            | RFC1271-MIB        | The number of packets received during this interval that were less than 64 octets long (excluding framing bits but including FCS octets) and were otherwise well formed.                                                                                             | Every 30 mins             |
| etherHistoryOversizePkts             | RFC1271-MIB        | The number of packets received during this interval that were longer than 1518 octets (excluding framing bits but including FCS octets) but were otherwise well formed.                                                                                              | Every 30 mins             |
| etherHistoryFragments                | RFC1271-MIB        | The total number of packets received during this sampling interval that were not an integral number of octets in length or that had a bad Frame Check Sequence (FCS), and were less than 64 octets in length (excluding framing bits but including FCS octets).      | Every 30 mins             |
| etherHistoryJabbers                  | RFC1271-MIB        | The number of packets received during this interval that were longer than 1518 octets (excluding framing bits but including FCS octets), and were not an integral number of octets in length or had a bad Frame Check Sequence (FCS).                                | Every 30 mins             |
| etherHistoryCollisions               | RFC1271-MIB        | The best estimate of the total number of collisions on this Ethernet segment during this interval.                                                                                                                                                                   | Every 30 mins             |
| <b>OSPF-MIB</b>                      |                    |                                                                                                                                                                                                                                                                      |                           |
| ospfIfEvents                         | OSPF-MIB           | The number of times this OSPF interface has changed its state, or an error has occurred.                                                                                                                                                                             | Every 30 mins             |
| <b>OSPF-MIB</b>                      |                    |                                                                                                                                                                                                                                                                      |                           |
| ospfNbrIpAddr                        | OSPF-MIB           | The IP address this neighbor is using in its IP Source Address. Note that, on addressless links, this will not be 0.0.0.0, but the address of another of the neighbor's interfaces.                                                                                  | Every 30 mins             |
| ospfNbrEvents                        | OSPF-MIB           | The number of times this neighbor relationship has changed state, or an error has occurred.                                                                                                                                                                          | Every 30 mins             |
| <b>SNMP-FRAMEWORK-MIB</b>            |                    |                                                                                                                                                                                                                                                                      |                           |
| snmplnInvalidMsgs                    | SNMP-FRAMEWORK-MIB | The total number of packets received by the SNMP engine which were dropped because there were invalid or inconsistent components in the SNMP message.                                                                                                                | Every 30 mins             |
| <b>SNMP-FRAMEWORK-MIB</b>            |                    |                                                                                                                                                                                                                                                                      |                           |
| snmplnPkts                           | SNMP-FRAMEWORK-MIB | The total number of Messages delivered to the SNMP entity from the transport service.                                                                                                                                                                                | Every 30 mins             |
| snmpOutPkts                          | SNMP-FRAMEWORK-MIB | The total number of SNMP Messages which were passed from the SNMP protocol entity to the transport service.                                                                                                                                                          | Every 30 mins             |
| snmplnBadVersions                    | SNMP-FRAMEWORK-MIB | The total number of SNMP Messages which were delivered to the SNMP protocol entity and were for an unsupported SNMP version.                                                                                                                                         | Every 30 mins             |
| snmplnBadCommunityUses               | SNMP-FRAMEWORK-MIB | The total number of SNMP Messages delivered to the SNMP protocol entity which represented an SNMP operation which was not allowed by the SNMP community named in the Message.                                                                                        | Every 30 mins             |
| snmplnASNParseErrs                   | SNMP-FRAMEWORK-MIB | The total number of ASN.1 or BER errors encountered by the SNMP protocol entity when decoding received SNMP Messages.                                                                                                                                                | Every 30 mins             |

| <u>Performance Metric Identifier</u> | <u>MIB Name</u>        | <u>Description</u>                                                                                                                                                      | <u>Default Succession</u>                 |
|--------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
|                                      |                        |                                                                                                                                                                         | <u>IEMS Collection</u><br><u>Interval</u> |
| snmplnTotalReqVars                   | SNMP-<br>FRAMEWORK-MIB | The total number of MIB objects which have been retrieved successfully by the SNMP protocol entity as the result of receiving valid SNMP Get-Request and Get-Next PDUs. | Every 30 mins                             |
| snmplnTotalSetVars                   | SNMP-<br>FRAMEWORK-MIB | The total number of MIB objects which have been altered successfully by the SNMP protocol entity as the result of receiving valid SNMP Set-Request PDUs.                | Every 30 mins                             |
| snmpOutTraps                         | SNMP-<br>FRAMEWORK-MIB | The total number of SNMP Trap PDUs which have been generated by the SNMP protocol entity.                                                                               | Every 30 mins                             |
| <b>VRRP-MIB</b>                      |                        |                                                                                                                                                                         |                                           |
| vrrpStatsBecomeMaster                | VRRP-MIB               | The total number of times that this virtual router's state has transitioned from BACKUP to MASTER.                                                                      | Every 30 mins                             |
| <b>RAPID-CITY</b>                    |                        |                                                                                                                                                                         |                                           |
| rcSysBufferUtil                      | RAPID-CITY             | Buffer utilization as a percentage of the total amount of buffer space in the system. A high value indicates congestion.                                                | Every 30 mins                             |
| rcSysBufferUtilPeak                  | RAPID-CITY             | The largest buffer utilization since sysUpTime.                                                                                                                         | Every 30 mins                             |
| rcSysBufferUtilPeakTime              | RAPID-CITY             | Timestamp for rcSysPeakBandwidth.                                                                                                                                       | Every 30 mins                             |
| rcSysNVRamUsed                       | RAPID-CITY             | Non-volatile RAM in use in Kbytes.                                                                                                                                      | Every 30 mins                             |
| rcSysCpuUtil                         | RAPID-CITY             | Percentage of CPU utilization.                                                                                                                                          | Every 30 mins                             |
| rcSysSwitchFabricUtil                | RAPID-CITY             | Percentage of Switching Fabric utilization.                                                                                                                             | Every 30 mins                             |
| rcStatFrameTooShorts                 | RAPID-CITY             | The total number of frames that are too short that were encountered on this interface.                                                                                  | Every 30 mins                             |
| rcStatBridgeInDiscards               | RAPID-CITY             | The total number of frames that were discarded by the bridging entity.                                                                                                  | Every 30 mins                             |
| rcStatRouteInDiscards                | RAPID-CITY             | The total number of frames that were discarded by the routing entity.                                                                                                   | Every 30 mins                             |
| rcStatStgForwardTransitions          | RAPID-CITY             | The number of times this port has transitioned from the Learning state to the Forwarding state.                                                                         | Every 30 mins                             |
| rcStatGigLinkFailures                | RAPID-CITY             | The total number of link failures encountered on this interface.                                                                                                        | Every 30 mins                             |
| rcStatGigPacketErrors                | RAPID-CITY             | The total number of packet errors encountered on this interface.                                                                                                        | Every 30 mins                             |
| rcStatGigCarrierErrors               | RAPID-CITY             | The total number of carrier errors encountered on this interface.                                                                                                       | Every 30 mins                             |
| rcStatGigLinkInactiveErrors          | RAPID-CITY             | The total number of link inactive errors encountered on this interface.                                                                                                 | Every 30 mins                             |
| rcStatSmltStDownCnt                  | RAPID-CITY             | Counters that counts how the session between the two peering switches has done down since last boot.                                                                    | Every 30 mins                             |
| rcStatSmltSmltDownTxMsgCnt           | RAPID-CITY             | Counters that counts the tx Smlt Down msg.                                                                                                                              | Every 30 mins                             |
| rcStatSmltSmltDownRxMsgCnt           | RAPID-CITY             | Counters that counts the rx Smlt Down msg.                                                                                                                              | Every 30 mins                             |
| rcStatSmltSmltUpTxMsgCnt             | RAPID-CITY             | Counters that counts the tx Smlt Up msg.                                                                                                                                | Every 30 mins                             |
| rcStatSmltSmltUpRxMsgCnt             | RAPID-CITY             | Counters that counts the rx Smlt Up msg.                                                                                                                                | Every 30 mins                             |
| rc2kAtmPortStatsInDroppedPkts        | RAPID-CITY             | Number of AAL5 CPCS PDUs dropped due to resource exhaustion.                                                                                                            | Every 30 mins                             |
| rc2kAtmPortStatsOutDroppedPkts       | RAPID-CITY             | Number of AAL5 CPCS PDUs dropped because the transmitter closed the channel.                                                                                            | Every 30 mins                             |
| rc2kAtmVPortStatsInOctets            | RAPID-CITY             | AAL5 CPCS PDU octets received from ATM interface                                                                                                                        | Every 5 and 30 mins                       |
| rc2kAtmVPortStatsOutOctets           | RAPID-CITY             | AAL5 CPCS PDU octets transmitted out of ATM interface                                                                                                                   | Every 5 and 30 mins                       |
| rc2kAtmVPortStatsInErrors            | RAPID-CITY             | AAL5 CPCS PDUs received with errors from ATM interface. These errors include CRC-32 errors,SAR time-out errors and oversized SDU errors.                                | Every 30 mins                             |
| rc2kAtmVPortStatsOutErrors           | RAPID-CITY             | Number of AAL5 CPCS PDUs that couldn't be transmitted due to errors.                                                                                                    | Every 30 mins                             |
| rc2kAtmVPortStatsInDiscards          | RAPID-CITY             | Number of received AAL5 CPCS PDUs discarded.                                                                                                                            | Every 30 mins                             |
| rc2kAtmVPortStatsOutDiscards         | RAPID-CITY             | Number of AAL5 CPCS PDUs which are to be transmitted but discarded.                                                                                                     | Every 30 mins                             |
| rcStgPortForwardTransitions          | RAPID-CITY             | The number of times this port has transitioned from the Learning state to the Forwarding state.                                                                         | Every 30 mins                             |

## Appendix B: MG 9000 MIB OMs/PMs

| OM Name                                     | Description                                                                               | MIB Table Name                       | MIB Name                | For OSS |
|---------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------|-------------------------|---------|
| <b>NORTEL-UEMG-NODE-MIB</b>                 |                                                                                           |                                      |                         |         |
| <b>norNodeAlarmsTable</b>                   |                                                                                           |                                      |                         |         |
| norNodeAlarmsCritical                       | Number of Critical Alarms currently on this Node                                          | norNodeAlarmsTable                   | NORTEL-UEMG-NODE-MIB    | No      |
| norNodeAlarmsMajor                          | Number of Major Alarms currently on this Node                                             | norNodeAlarmsTable                   | NORTEL-UEMG-NODE-MIB    | No      |
| norNodeAlarmsMinor                          | Number of Minor Alarms currently on this Node                                             | norNodeAlarmsTable                   | NORTEL-UEMG-NODE-MIB    | No      |
| <b>NORTEL-UEMG-CARRIER-MIB</b>              |                                                                                           |                                      |                         |         |
| <b>norCarrSonetMediumCurrentTable</b>       |                                                                                           |                                      |                         |         |
| norCarrSonetMedCurrentOpt                   | Optical Power Transmitted. This is interpreted as a Percentage                            | norCarrSonetMediumCurrentTable       | NORTEL-UEMG-CARRIER-MIB | No      |
| norCarrSonetMedCurrentLBC                   | Laser Bias Current.                                                                       | norCarrSonetMediumCurrentTable       | NORTEL-UEMG-CARRIER-MIB | No      |
| <b>norCarrSonetMediumIntervalTable</b>      |                                                                                           |                                      |                         |         |
| norCarrSonetMedCurrentOpt                   | Optical Power Transmitted. This is interpreted as a Percentage                            | norCarrSonetMediumIntervalTable      | NORTEL-UEMG-CARRIER-MIB | Yes     |
| norCarrSonetMedIntervalLBC                  | Laser Bias Current.                                                                       | norCarrSonetMediumIntervalTable      | NORTEL-UEMG-CARRIER-MIB | Yes     |
| <b>NORTEL-UEMG-MEGACO-MIB</b>               |                                                                                           |                                      |                         |         |
| <b>nnMegacoOMMedGwyIntervalTable</b>        |                                                                                           |                                      |                         |         |
| nnMegacoOMMedGwyNumInMessages               | Total number of messages received from the Gateway Controller (GWC) during this interval. | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyNumInOctets                 | Total number of octets received from the Gateway Controller (GWC) during this interval.   | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyAvrgInMsgRate               | Average message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyMaxInMsgRate                | Maximum message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyNumOutMessages              | Total number of messages sent to the Gateway Controller (GWC) during this interval.       | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyNumOutOctets                | Total number of octets sent to the Gateway Controller (GWC) during this interval.         | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyAvrgOutMsgRate              | Average message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyMaxOutMsgRate               | Maximum message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB  | No      |
| <b>nnMegacoOMMedGwyCurrentDayTotalTable</b> |                                                                                           |                                      |                         |         |
| nnMegacoOMMedGwyNumInMessagesTotCurDay      | Total number of messages received from the Gateway Controller (GWC) during this interval. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyNumInOctetsTotCurDay        | Total number of octets received from the Gateway Controller (GWC) during this interval.   | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB  | No      |
| nnMegacoOMMedGwyAvrgInMsgRateTotCurDay      | Average message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB  | No      |

|                                          |                                                                                           |                                      |                        |    |
|------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------|------------------------|----|
| nnMegacoOMMedGwyMaxInMsgRateTotCurDay    | Maximum message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMMedGwyNumOutMessagesTotCurDay  | Total number of messages sent to the Gateway Controller (GWC) during this interval.       | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMMedGwyNumOutOctetsTotCurDay    | Total number of octets sent to the Gateway Controller (GWC) during this interval.         | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMMedGwyAvgOutMsgRateTotCurDay   | Average message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMMedGwyMaxOutMsgRateTotCurDay   | Maximum message send rate (per minute) for messages sent to the GWC during this interval. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No |
| <b>nnMegacoOMCMRIntervalTable</b>        |                                                                                           |                                      |                        |    |
| nnMegacoOMCMRmaxSimultCNDreq             | The maximum simultaneous number of CND requests during this interval.                     | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberCNDreq             | The total number of CND requests during this interval.                                    | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumCNDcompleted             | The number of CND requests during this interval that completed.                           | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRmaxSimultADSIreq            | The maximum simultaneous number of ADSI requests during this interval.                    | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberADSIreq            | The total number of ADSI requests during this interval.                                   | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumADSIcompleted            | The number of ADSI requests during this interval that completed.                          | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRmaxSimultBCLIDreq           | The maximum simultaneous number of BCLID requests during this interval.                   | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberBCLIDreq           | The total number of BCLID requests during this interval.                                  | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumBCLIDcompleted           | The number of BCLID requests during this interval that completed.                         | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRmaxSimultSCWIDreq           | The maximum simultaneous number of SCWID requests during this interval.                   | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberSCWIDreq           | The total number of SCWID requests during this interval.                                  | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumSCWIDcompleted           | The number of SCWID requests during this interval that completed.                         | nnMegacoOMCMRIntervalTable           | NORTEL-UEMG-MEGACO-MIB | No |
| <b>nnMegacoOMCMRCurrentDayTotalTable</b> |                                                                                           |                                      |                        |    |
| nnMegacoOMCMRmaxSimultCNDreqTotCurDay    | The current day's highest maximum simultaneous number of CND requests.                    | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberCNDreqTotCurDay    | The current day's total number of CND requests.                                           | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumCNDcompletedTotCurDay    | The current day's total number of CND requests that completed.                            | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRmaxSimultADSIreqTotCurDay   | The current day's highest maximum simultaneous number of ADSI requests.                   | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberADSIreqTotCurDay   | The current day's total number of ADSI requests.                                          | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumADSIcompletedTotCurDay   | The current day's total number of ADSI requests that completed.                           | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRmaxSimultBCLIDreqTotCurDay  | The current day's highest maximum simultaneous number of BCLID requests.                  | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRtotNumberBCLIDreqTotCurDay  | The current day's total number of BCLID requests.                                         | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |
| nnMegacoOMCMRnumBCLIDcompletedTotCurDay  | The current day's total number of BCLID requests that completed.                          | nnMegacoOMCMRCurrentDayTotalTable    | NORTEL-UEMG-MEGACO-MIB | No |



|                                              |                                                                                                            |                                   |                        |     |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------|-----|
| nnMegacoOMCMRmaxSimultSCWIDreqTotCurDay      | The current day's highest maximum simultaneous number of SCWID requests.                                   | nnMegacoOMCMRCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCMRtotNumberSCWIDreqTotCurDay      | The current day's total number of SCWID requests.                                                          | nnMegacoOMCMRCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCMRnumSCWIDcompletedTotCurDay      | The current day's total number of SCWID requests that completed.                                           | nnMegacoOMCMRCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| <b>nnMegacoOMDSPIntervalTable</b>            |                                                                                                            |                                   |                        |     |
| nnMegacoOMDSPmaxSimultToneRcvrlnUse          | The maximum simultaneous number of tone receivers in use during this interval.                             | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumToneRcvrReq                  | The number of tone receiver requests during this interval.                                                 | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMDSPnumToneRcvrReqFail              | The number of tone receiver requests that failed during this interval.                                     | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMDSPmaxSimultToneGenlnUse           | The maximum simultaneous number of tone generators in use during this interval.                            | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumToneGenReq                   | The number of tone generator requests during this interval.                                                | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMDSPnumToneGenReqFail               | The number of tone generator requests that failed during this interval.                                    | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMDSPmaxSimultCMRmodemlnUse          | The maximum simultaneous number of CMR modems in use during this interval.                                 | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumCMRmodemReq                  | The number of CMR modem requests during this interval.                                                     | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMDSPnumCMRmodemReqFail              | The number of CMR modem requests that failed during this interval.                                         | nnMegacoOMDSPIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| <b>nnMegacoOMDSPCurrentDayTotalTable</b>     |                                                                                                            |                                   |                        |     |
| nnMegacoOMDSPmaxSimultToneRcvrlnUseTotCurDay | The current day's highest maximum simultaneous number of tone receivers in use.                            | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumToneRcvrReqTotCurDay         | The current day's total of the number of tone receiver requests.                                           | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumToneRcvrReqFailTotCurDay     | The current day's total of the number tone receiver requests that failed.                                  | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPmaxSimultToneGenlnUseTotCurDay  | The current day's highest maximum simultaneous number of tone generators in use.                           | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumToneGenReqTotCurDay          | The current day's total of the number of tone generator requests.                                          | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumToneGenReqFailTotCurDay      | The current day's total of the number tone generator requests that failed.                                 | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPmaxSimultCMRmodemlnUseTotCurDay | The current day's highest maximum simultaneous number of CMR modems in use.                                | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumCMRmodemReqTotCurDay         | The current day's total of the number of CMR modem requests.                                               | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMDSPnumCMRmodemReqFailTotCurDay     | The current day's total of the number CMR modem requests that failed.                                      | nnMegacoOMDSPCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| <b>nnMegacoOMCESIntervalTable</b>            |                                                                                                            |                                   |                        |     |
| nnMegacoOMCESmaxSimultIntraSwitch            | The maximum simultaneous number of channels in use for intra-switched calls during this interval.          | nnMegacoOMCESIntervalTable        | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESnumChnlAllocIntra               | The total number of channel allocation requests for intra-switched calls during this interval.             | nnMegacoOMCESIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMCESnumChnlAllocIntraFail           | The total number of channel allocation requests for intra-switched calls that failed during this interval. | nnMegacoOMCESIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |

|                                               |                                                                                                            |                                     |                        |     |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------|------------------------|-----|
| nnMegacoOMCESmaxSimultInterSwitch             | The maximum simultaneous number of channels in use for inter-switched calls during this interval.          | nnMegacoOMCESIntervalTable          | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESnumChnlAllocInter                | The total number of channel allocation requests for inter-switched calls during this interval.             | nnMegacoOMCESIntervalTable          | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMCESnumChnlAllocInterFailed          | The total number of channel allocation requests for inter-switched calls that failed during this interval. | nnMegacoOMCESIntervalTable          | NORTEL-UEMG-MEGACO-MIB | Yes |
| <b>nnMegacoOMCESCurrentDayTotalTable</b>      |                                                                                                            |                                     |                        |     |
| nnMegacoOMCESmaxSimultIntraSwitchTotCurDay    | The current day's highest maximum simultaneous number of channels in use for intra-switched calls.         | nnMegacoOMCESCurrentDayTotalTable   | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESnumChnlAllocIntraTotCurDay       | The current day's total number of channel allocation requests for intra-switched calls.                    | nnMegacoOMCESCurrentDayTotalTable   | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESnumChnlAllocIntraFailedTotCurDay | The current day's total number of channel allocation requests for intra-switched calls that failed.        | nnMegacoOMCESCurrentDayTotalTable   | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESmaxSimultInterSwitchTotCurDay    | The current day's highest maximum simultaneous number of channels in use for inter-switched calls.         | nnMegacoOMCESCurrentDayTotalTable   | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESnumChnlAllocInterTotCurDay       | The current day's total number of channel allocation requests for inter-switched calls.                    | nnMegacoOMCESCurrentDayTotalTable   | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMCESnumChnlAllocInterFailedTotCurDay | The current day's total number of channel allocation requests for inter-switched calls that failed.        | nnMegacoOMCESCurrentDayTotalTable   | NORTEL-UEMG-MEGACO-MIB | No  |
| <b>nnMegacoOMECHANIntervalTable</b>           |                                                                                                            |                                     |                        |     |
| nnMegacoOMECHANmaxSimultResrcInUse            | The maximum simultaneous number of ECAN resources in use during this interval.                             | nnMegacoOMECHANIntervalTable        | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMECHANnumResrcReq                    | The total number of ECAN resource request attempts during this interval.                                   | nnMegacoOMECHANIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMECHANnumResrcReqFailed              | The total number of ECAN resource request attempts that failed during this interval.                       | nnMegacoOMECHANIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| <b>nnMegacoOMECHANCurrentDayTotalTable</b>    |                                                                                                            |                                     |                        |     |
| nnMegacoOMECHANmaxSimultResrcInUseTotCurDay   | The current day's maximum simultaneous number of ECAN resources in use.                                    | nnMegacoOMECHANCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMECHANnumResrcReqTotCurDay           | The current day's total number of ECAN resource requests.                                                  | nnMegacoOMECHANCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMECHANnumResrcReqFailedTotCurDay     | The current day's total number of ECAN resource requests that failed.                                      | nnMegacoOMECHANCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| <b>nnMegacoQoSIntervalTable</b>               |                                                                                                            |                                     |                        |     |
| nnMegacoQoSIntervalCalls                      | total number of calls (in this 15-min interval)."                                                          | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoQoSIntervalBadCalls                   | total number of bad calls (in this 15-min interval)."                                                      | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoQoSIntervalPktsSent                   | number of packets sent (in this 15-min interval)."                                                         | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoQoSIntervalPktsLost                   | number of packets lost (in this 15-min interval)."                                                         | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoQoSIntervalPktLossPct                 | % of packets lost (in this 15-min interval)."                                                              | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoQoSIntervalJitter                     | average jitter (in a 15-min interval)."                                                                    | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoQoSIntervalLatency                    | average latency (in a 15-min interval)."                                                                   | nnMegacoQoSIntervalTable            | NORTEL-UEMG-MEGACO-MIB | Yes |
| <b>nnMegacoQoSCurrDayTable</b>                |                                                                                                            |                                     |                        |     |
| nnMegacoQoSCurrDayCalls                       | total number of calls (in current day)."                                                                   | nnMegacoQoSCurrDayTable             | NORTEL-UEMG-MEGACO-MIB | No  |

|                                             |                                                                                               |                                      |                        |     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------|------------------------|-----|
| nnMegacoQoScurrDayBadCalls                  | total number of bad calls (in current day)."                                                  | nnMegacoQoScurrDayTable              | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoQoScurrDayPktsSent                  | number of packets sent (in current day)."                                                     | nnMegacoQoScurrDayTable              | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoQoScurrDayPktsLost                  | number of packets lost (in this 15-min interval)."                                            | nnMegacoQoScurrDayTable              | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoQoScurrDayPktLossPct                | % of packets lost (in current day)."                                                          | nnMegacoQoScurrDayTable              | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoQoScurrDayJitter                    | average jitter (in current day)."                                                             | nnMegacoQoScurrDayTable              | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoQoScurrDayJitter                    | average latency (in current day)."                                                            | nnMegacoQoScurrDayTable              | NORTEL-UEMG-MEGACO-MIB | No  |
| <b>nnMegacoOMMedGwyIntervalTable</b>        |                                                                                               |                                      |                        |     |
| nnMegacoOMMedGwyNumInMessages               | Number of messages received from the Gateway Controller (GWC) during this interval.           | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyNumInOctets                 | Number of octets received from the Gateway Controller (GWC) during this interval.             | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyAvrgInMsgRate               | Average message rate (per minute) for messages received from the GWC during this interval.    | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyMaxInMsgRate                | Maximum message rate (per minute) for messages received from the GWC during this interval.    | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyNumOutMessages              | Number of messages sent to the Gateway Controller (GWC) during this interval.                 | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyNumOutOctets                | Number of octets sent to the Gateway Controller (GWC) during this interval.                   | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyAvrgOutMsgRate              | Average message rate (per minute) for messages sent to the GWC during this interval.          | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| nnMegacoOMMedGwyMaxOutMsgRate               | Maximum message rate (per minute) for messages sent to the GWC during this interval.          | nnMegacoOMMedGwyIntervalTable        | NORTEL-UEMG-MEGACO-MIB | Yes |
| <b>nnMegacoOMMedGwyCurrentDayTotalTable</b> |                                                                                               |                                      |                        |     |
| nnMegacoOMMedGwyNumInMessagesTotCurDay      | The current day's total Number of messages received from the Gateway Controller (GWC).        | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyNumInOctetsTotCurDay        | The current day's total Number of octets received from the Gateway Controller (GWC).          | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyAvrgInMsgRateTotCurDay      | The current day's total Average message rate (per minute) for messages received from the GWC. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyMaxInMsgRateTotCurDay       | The current day's total Maximum message rate (per minute) for messages received from the GWC. | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyNumOutMessagesTotCurDay     | The current day's total Number of messages sent to the Gateway Controller (GWC).              | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyNumOutOctetsTotCurDay       | The current day's total Number of octets sent to the Gateway Controller (GWC).                | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyAvrgOutMsgRateTotCurDay     | The current day's total Average message rate (per minute) for messages sent to the GWC.       | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| nnMegacoOMMedGwyMaxOutMsgRateTotCurDay      | The current day's total Maximum message rate (per minute) for messages sent to the GWC.       | nnMegacoOMMedGwyCurrentDayTotalTable | NORTEL-UEMG-MEGACO-MIB | No  |
| <b>NORTEL-UEMG-BANDWIDTH-MIB</b>            |                                                                                               |                                      |                        |     |
| <b>nnBwShelfCurrentSloaBandwResrvdTable</b> |                                                                                               |                                      |                        |     |

|                                              |                                                                                                                                                              |                                        |                           |     |
|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------|-----|
| nnBwShelfCurrentSloaBandwReserved            | Current amount of reserved bandwidth currently allocated for the aggregate of all Switched Lines over ATM VCs on This UEMG shelf.                            | nnBwShelfCurrentSloaBandwResrvd Table  | NORTEL-UEMG-BANDWIDTH-MIB | No  |
| nnBwShelfCapacitySloaBandwReserved           | Current amount of reserved bandwidth Capacity for the aggregate of all Switched Lines over ATM VCs on This UEMG shelf.                                       | nnBwShelfCurrentSloaBandwResrvd Table  | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| <b>nnBwNetIfBwResIntervalTable</b>           |                                                                                                                                                              |                                        |                           |     |
| nnBwNetIfBwResIntervalTotal                  | The ith 15min measure of the amount of reserved bandwidth currently allocated to VCs on the network interface.                                               | nnBwNetIfBwResIntervalTable            | NORTEL-UEMG-BANDWIDTH-MIB | No  |
| nnBwNetIfBwResIntervalSloa                   | The ith 15min measure of the amount of reserved bandwidth currently allocated for the aggregate of all Switched Lines over ATM VCs on the network interface. | nnBwNetIfBwResIntervalTable            | NORTEL-UEMG-BANDWIDTH-MIB | No  |
| <b>nnBwShelfIntervalSloaBandwResrvdTable</b> |                                                                                                                                                              |                                        |                           |     |
| nnBwShelfIntervalSloaBandwReserved           | ith 15-minute measure amount of reserved band width allocated for the aggregate of all Switched Lines over ATM VCs on This UEMG shelf."                      | nnBwShelfIntervalSloaBandwResrvd Table | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| <b>nnBwIntervalBandwUtilTable</b>            |                                                                                                                                                              |                                        |                           |     |
| nnBwBandwUtilIntervalInCellRate              | The ith 15min measure of the inbound bandwidth utilization.                                                                                                  | nnBwIntervalBandwUtilTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwBandwUtilIntervalOutCellRate             | The ith 15min measure of the outbound bandwidth utilization.                                                                                                 | nnBwIntervalBandwUtilTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwBandwUtilIntervalInDslCellRate           | The ith 15min measure of the inbound dsl band width utilization.                                                                                             | nnBwIntervalBandwUtilTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwBandwUtilIntervalOutDslCellRate          | The ith 15min measure of the outbound dsl band width utilization.                                                                                            | nnBwIntervalBandwUtilTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| <b>nnBwIntervalQueueFillTable</b>            |                                                                                                                                                              |                                        |                           |     |
| nnBwQueueFillIntervalTotal                   | ith 15-minute value % fill of the entire input cell queue associated with the central switching fabric.                                                      | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwQueueFillIntervalCbr                     | ith 15-minute value % fill of the entire input queue associated with the aggregate of all CBR VCs.                                                           | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwQueueFillIntervalRtVbr                   | ith 15-minute value % fill of the entire input queue associated with the aggregate of all rt-VBR VCs.                                                        | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwQueueFillIntervalNrtVbr                  | ith 15-minute value % fill of the entire input queue associated with the aggregate of all nrt-VBR VCs.                                                       | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwQueueFillIntervalUbr                     | ith 15-minute value % fill of the entire input queue associated with the aggregate of all UBR VCs.                                                           | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwQueueFillIntervalUbrPlus                 | ith 15-minute value % fill of the entire input queue associated with the aggregate of all UBR+ VCs.                                                          | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| nnBwQueueFillIntervalControl                 | ith 15-minute value % fill of the entire input queue associated with the aggregate of all Control VCs.                                                       | nnBwIntervalQueueFillTable             | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| <b>nnBwAbiCurrentBandwResrvdTable</b>        |                                                                                                                                                              |                                        |                           |     |
| nnBwAbiCurrentBandwReserved                  | Current amount of reserved bandwidth currently allocated for the aggregate of all VCs on this UEMG ABI interface.                                            | nnBwAbiCurrentBandwResrvdTable         | NORTEL-UEMG-BANDWIDTH-MIB | No  |
| nnBwAbiCapacityBandwReserved                 | Current amount of reserved bandwidth Capacity for the aggregate of all ABI VCs on this ABI interface.                                                        | nnBwAbiCurrentBandwResrvdTable         | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| <b>nnBwAbiIntervalBandwResrvdEntry</b>       |                                                                                                                                                              |                                        |                           |     |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                           |     |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------|-----|
| nnBwAbiIntervalBandwReserved   | ith 15-minute measure amount of reserved bandwidth allocated for the aggregate of all VCs on this ABI interface."                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | nnBwAbiIntervalBandwResrvdTable | NORTEL-UEMG-BANDWIDTH-MIB | Yes |
| <b>SNMP-MPD-MIB</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                           |     |
| <b>SNMP Table</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                           |     |
| snmplInvalidMsgs               | The total number of packets received by the SNMP engine which were dropped because there were invalid or inconsistent components in the SNMP message.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SNMP Table                      | SNMP-MPD-MIB              | Yes |
| <b>SNMPv2-MIB</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                           |     |
| snmplnBadCommunityNames        | The total number of community-based SNMP messages (for example, SNMPv1) delivered to the SNMP entity which used an SNMP community name not known to said entity. Also, implementations which authenticate community-based SNMP messages using check(s) in addition to matching the community name (for example, by also checking whether the message originated from a transport address allowed to use a specified community name) MAY include in this value the number of messages which failed the additional check(s). It is to authenticate community-based SNMP messages specify the precise conditions that contribute to this value. |                                 | SNMPv2-MIB                | Yes |
| snmplnPkts                     | The total number of messages delivered to the SNMP entity from the transport service.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                 | SNMPv2-MIB                | Yes |
| <b>NORTEL-UEMG-CLKSYNC-MIB</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                 |                           |     |
| <b>NnClkSyncRefTable</b>       | This table provides status information for each of the sync reference inputs associated with the ITP card. There are six references per ITP card, two ITP cards on each shelf.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |                           |     |
| nnClkSyncRefId                 | Reference Identification... Identifies the six possible clock synchronization references on the ITP card. This field along with entPhysicalIndex defines a unique row in the nnClkSyncRefTable.<br><br>itx0 (1), -- reference coming from the left ITX (ITX 0)<br>itx1 (2), -- reference coming from the right ITX (ITX 1)<br>dcc0 (3), -- reference coming from the left DCC (DCC-0)<br>dcc1 (4), -- reference coming from the right DCC (DCC-1)<br>host0 (5), -- reference cabled into the ITP ATM25 phy0<br>host1 (6) -- reference cabled into the ITP ATM25 phy1 "                                                                       | NnClkSyncRefTable               | NORTEL-UEMG-CLKSYNC-MIB   | Yes |
| nnClkSyncRefLossOfSignalCount  | Contains the count of the number of onsets of timing reference signal loss. Range is from 0 - 255                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | NnClkSyncRefTable               | NORTEL-UEMG-CLKSYNC-MIB   | Yes |
| nnClkSyncRefLossOfFrameCount   | Contains the count of the number of loss of frames. Range is from 0 - 255.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | NnClkSyncRefTable               | NORTEL-UEMG-CLKSYNC-MIB   | Yes |

|                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                         |     |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------|-----|
| <b>NnClkSyncSignalTable</b>      | This table provides status information on each of the six timing signals coming into the UE9KMG host shelf. There is one entry for each network timing signal (total of two), and one entry for each BITS signal (total of 4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                      |                         |     |
| nnClkSyncSignalId                | Signal Identification... Identifies the six possible timing source signals which eventually are seen as references into the ITP card. This field defines a unique row in the nnClkSyncSignalTable.<br>bitsA-0 (1), -- BITS A signal coming into the left ITX of<br>-- the BITS ITX connected pair.<br>bitsB-0 (2), -- BITS B signal coming into the left ITX of<br>-- the BITS ITX connected pair.<br>bitsA-1 (3), -- BITS A signal coming into the right ITX of<br>-- the BITS ITX connected pair.<br>bitsB-1 (4), -- BITS B signal coming into the right ITX of<br>-- the BITS ITX connected pair.<br>dcc-0 (5), -- Network Traffic signal coming into DCC-0<br>dcc-1 (6) -- Network Traffic signal coming into DCC-1" | NnClkSyncSignalTable | NORTEL-UEMG-CLKSYNC-MIB | Yes |
| nnClkSyncSignalLossOfFrameCount  | Contains the count of the number of loss of frames.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | NnClkSyncSignalTable | NORTEL-UEMG-CLKSYNC-MIB | Yes |
| nnClkSyncSignalLossOfSignalCount | Contains the count of the number of onsets of timing source signal loss.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | NnClkSyncSignalTable | NORTEL-UEMG-CLKSYNC-MIB | Yes |
| <b>DS1-MIB</b>                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                         |     |
| <b>dsx1CurrentTable</b>          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                         |     |
| dsx1CurrentESs                   | The number of Errored Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentSESSs                 | The number of Severely Errored Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentSEFSs                 | The number of Severely Errored Framing Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentUASs                  | The number of Unavailable Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentCSSs                  | The number of Controlled Slip Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentPCVs                  | The number of Path Coding Violations.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentLEsSs                 | The number of Line Errored Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentBESs                  | The number of Bursty Errored Seconds                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentDMs                   | The number of Degraded Minutes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | dsx1CurrentTable     | DS1-MIB                 | No  |
| dsx1CurrentLCVs                  | The number of Line Code Violations (LCVs).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | dsx1CurrentTable     | DS1-MIB                 | No  |
| <b>dsx1IntervalTable</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                         |     |
| dsx1IntervalESs                  | The number of Errored Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | dsx1IntervalTable    | DS1-MIB                 | No  |
| dsx1IntervalSESSs                | The number of Severely Errored Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | dsx1IntervalTable    | DS1-MIB                 | No  |
| dsx1IntervalSEFSs                | The number of Severely Errored Framing Seconds.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | dsx1IntervalTable    | DS1-MIB                 | No  |
| dsx1IntervalUASs                 | The number of Unavailable Seconds.<br>This object may decrease if the occurrence of unavailable seconds occurs across an interval boundary.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | dsx1IntervalTable    | DS1-MIB                 | No  |

|                               |                                                                                                                                                         |                        |         |    |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------|----|
| dsx1IntervalCSSs              | The number of Controlled Slip Seconds.                                                                                                                  | dsx1IntervalTable      | DS1-MIB | No |
| dsx1IntervalPCVs              | The number of Path Coding Violations.                                                                                                                   | dsx1IntervalTable      | DS1-MIB | No |
| dsx1IntervalLESSs             | The number of Line Errored Seconds.                                                                                                                     | dsx1IntervalTable      | DS1-MIB | No |
| dsx1IntervalBESs              | The number of Bursty Errored Seconds                                                                                                                    | dsx1IntervalTable      | DS1-MIB | No |
| dsx1IntervalDMs               | The number of Degraded Minutes                                                                                                                          | dsx1IntervalTable      | DS1-MIB | No |
| dsx1IntervalLCVs              | The number of Line Code Violations.                                                                                                                     | dsx1IntervalTable      | DS1-MIB | No |
| <b>dsx1TotalTable</b>         |                                                                                                                                                         |                        |         |    |
| dsx1CurrentESs                | The sum of Errored Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                     | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentSESSs              | The number of Severely Errored Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.         | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentSEFSs              | The number of Severely Errored Framing Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0. | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentUASs               | The number of Unavailable Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.              | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentCSSs               | The number of Controlled Slip Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.          | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentPCVs               | The number of Path Coding Violations encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.           | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentLESSs              | The number of Line Errored Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.             | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentBESs               | The number of Bursty Errored Seconds                                                                                                                    | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentDMs                | The number of Degraded Minutes                                                                                                                          | dsx1TotalTable         | DS1-MIB | No |
| dsx1CurrentLCVs               | The number of Line Code Violations (LCVs) encountered by a DS1 interface in the current 15 minute interval. Invalid 15 minute intervals count as 0.     | dsx1TotalTable         | DS1-MIB | No |
| <b>dsx1FarEndCurrentTable</b> |                                                                                                                                                         |                        |         |    |
| dsx1CurrentESs                | The number of Far End Errored Seconds.                                                                                                                  | dsx1FarEndCurrentTable | DS1-MIB | No |
| dsx1CurrentSESSs              | The number of Far End Severely Errored Seconds.                                                                                                         | dsx1FarEndCurrentTable | DS1-MIB | No |
| dsx1CurrentSEFSs              | The number of Far End Severely Errored Framing Seconds.                                                                                                 | dsx1FarEndCurrentTable | DS1-MIB | No |
| dsx1CurrentUASs               | The number of Unavailable Seconds.                                                                                                                      | dsx1FarEndCurrentTable | DS1-MIB | No |
| dsx1CurrentCSSs               | The number of Far End Controlled Slip Seconds.                                                                                                          | dsx1FarEndCurrentTable | DS1-MIB | No |
| dsx1CurrentLESSs              | The number of Far End Line Errored Seconds.                                                                                                             | dsx1FarEndCurrentTable | DS1-MIB | No |
| dsx1CurrentPCVs               | The number of Far End Path Coding Violations.                                                                                                           | dsx1FarEndCurrentTable | DS1-MIB | No |

|                                 |                                                                                                                                                                                                  |                          |           |    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------|----|
| dsx1CurrentBESs                 | The number of Bursty Errored Seconds                                                                                                                                                             | dsx1FarEndCurrentTable   | DS1-MIB   | No |
| dsx1CurrentDMs                  | The number of Degraded Minutes                                                                                                                                                                   | dsx1FarEndCurrentTable   | DS1-MIB   | No |
| <b>dsx1FarEndIntervalTable</b>  |                                                                                                                                                                                                  |                          |           |    |
| dsx1CurrentESs                  | The number of Far End Errored Seconds.                                                                                                                                                           | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentSESSs                | The number of Far End Severely Errored Seconds.                                                                                                                                                  | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentSEFSs                | The number of Far End Severely Errored Framing Seconds.                                                                                                                                          | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentUASs                 | The number of Unavailable Seconds.                                                                                                                                                               | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentCSSs                 | The number of Far End Controlled Slip Seconds.                                                                                                                                                   | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentLESSs                | The number of Far End Line Errored Seconds.                                                                                                                                                      | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentPCVs                 | The number of Far End Path Coding Violations.                                                                                                                                                    | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentBESs                 | The number of Bursty Errored Seconds                                                                                                                                                             | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| dsx1CurrentDMs                  | The number of Degraded Minutes                                                                                                                                                                   | dsx1FarEndIntervalTable  | DS1-MIB   | No |
| <b>dsx1FarEndTotalTable</b>     |                                                                                                                                                                                                  |                          |           |    |
| dsx1CurrentESs                  | The number of Far End Errored Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                                   | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentSESSs                | The number of Far End Severely Errored Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                          | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentSEFSs                | The number of Far End Severely Errored Framing Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                  | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentUASs                 | The number of Unavailable Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                                       | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentCSSs                 | The number of Far End Controlled Slip Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                           | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentLESSs                | The number of Far End Line Errored Seconds encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                              | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentPCVs                 | The number of Far End Path Coding Violations reported via the far end block error count encountered by a DS1 interface in the previous 24 hour interval. Invalid 15 minute intervals count as 0. | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentBESs                 | The number of Bursty Errored Seconds                                                                                                                                                             | dsx1FarEndTotalTable     | DS1-MIB   | No |
| dsx1CurrentDMs                  | The number of Degraded Minutes                                                                                                                                                                   | dsx1FarEndTotalTable     | DS1-MIB   | No |
| <b>SONET-MIB</b>                |                                                                                                                                                                                                  |                          |           |    |
| <b>sonetSectionCurrentTable</b> |                                                                                                                                                                                                  |                          |           |    |
| sonetSectionCurrentESs          | The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.                                                                  | sonetSectionCurrentTable | SONET-MIB | No |



|                                  |                                                                                                                                                                        |                           |           |     |
|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------|-----|
| sonetSectionCurrentSESSs         | The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in the current 15 minute interval.                               | sonetSectionCurrentTable  | SONET-MIB | No  |
| sonetSectionCurrentSEFFSs        | The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in the current 15 minute interval.                       | sonetSectionCurrentTable  | SONET-MIB | No  |
| sonetSectionCurrentCVs           | The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in the current 15 minute interval.                                      | sonetSectionCurrentTable  | SONET-MIB | No  |
| <b>sonetSectionIntervalTable</b> |                                                                                                                                                                        |                           |           |     |
| sonetSectionIntervalESSs         | The counter associated with the number of Errored Seconds encountered by a SONET/SDH Section in a particular 15-minute interval in the past 24 hours.                  | sonetSectionIntervalTable | SONET-MIB | Yes |
| sonetSectionIntervalSESSs        | The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Section in a particular 15-minute interval in the past 24 hours.         | sonetSectionIntervalTable | SONET-MIB | Yes |
| sonetSectionIntervalSEFFSs       | The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET/SDH Section in a particular 15-minute interval in the past 24 hours. | sonetSectionIntervalTable | SONET-MIB | Yes |
| sonetSectionIntervalCVs          | The counter associated with the number of Coding Violations encountered by a SONET/SDH Section in a particular 15-minute interval in the past 24 hours.                | sonetSectionIntervalTable | SONET-MIB | Yes |
| <b>sonetLineCurrentTable</b>     |                                                                                                                                                                        |                           |           |     |
| sonetLineCurrentESSs             | The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.                                           | sonetLineCurrentTable     | SONET-MIB | No  |
| sonetLineCurrentSESSs            | The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in the current 15 minute interval.                                  | sonetLineCurrentTable     | SONET-MIB | No  |
| sonetLineCurrentCVs              | The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in the current 15 minute interval.                                         | sonetLineCurrentTable     | SONET-MIB | No  |
| sonetLineCurrentUASSs            | The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in the current 15 minute interval.                                       | sonetLineCurrentTable     | SONET-MIB | No  |
| <b>sonetLineIntervalTable</b>    |                                                                                                                                                                        |                           |           |     |
| sonetLineIntervalESSs            | The counter associated with the number of Errored Seconds encountered by a SONET/SDH Line in a particular 15-minute interval in the past 24 hours.                     | sonetLineIntervalTable    | SONET-MIB | Yes |
| sonetLineIntervalSESSs           | The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Line in a particular 15-minute interval in the past 24 hours.            | sonetLineIntervalTable    | SONET-MIB | Yes |

|                                     |                                                                                                                                                                                                                   |                              |           |     |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------|-----|
| sonetLineIntervalCVs                | The counter associated with the number of Coding Violations encountered by a SONET/SDH Line in a particular 15-minute interval in the past 24 hours.                                                              | sonetLineIntervalTable       | SONET-MIB | Yes |
| sonetLineIntervalUASs               | The counter associated with the number of Unavailable Seconds encountered by a SONET/SDH Line in a particular 15-minute interval in the past 24 hours.                                                            | sonetLineIntervalTable       | SONET-MIB | Yes |
| <b>sonetFarEndLineCurrentTable</b>  |                                                                                                                                                                                                                   |                              |           |     |
| sonetFarEndLineCurrentESSs          | The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.                                                                         | sonetFarEndLineCurrentTable  | SONET-MIB | No  |
| sonetFarEndLineCurrentSESSs         | The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.                                            | sonetFarEndLineCurrentTable  | SONET-MIB | No  |
| sonetFarEndLineCurrentCVs           | The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.        | sonetFarEndLineCurrentTable  | SONET-MIB | No  |
| sonetFarEndLineCurrentUASs          | The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Medium/Section/Line interface in the current 15 minute interval.                                                 | sonetFarEndLineCurrentTable  | SONET-MIB | No  |
| <b>sonetFarEndLineIntervalTable</b> |                                                                                                                                                                                                                   |                              |           |     |
| sonetFarEndLineIntervalESSs         | The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH Line interface in a particular 15-minute interval in the past 24 hours.                                              | sonetFarEndLineIntervalTable | SONET-MIB | No  |
| sonetFarEndLineIntervalSESSs        | The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Line interface in a particular 15-minute interval in the past 24 hours.                                     | sonetFarEndLineIntervalTable | SONET-MIB | No  |
| sonetFarEndLineIntervalCVs          | The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Line interface in a particular 15-minute interval in the past 24 hours. | sonetFarEndLineIntervalTable | SONET-MIB | No  |
| sonetFarEndLineIntervalUASs         | The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Line interface in a particular 15-minute interval in the past 24 hours.                                          | sonetFarEndLineIntervalTable | SONET-MIB | No  |
| <b>sonetPathCurrentTable</b>        |                                                                                                                                                                                                                   |                              |           |     |
| sonetPathCurrentESSs                | The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.                                                                                      | sonetPathCurrentTable        | SONET-MIB | No  |

|                                     |                                                                                                                                                                                             |                              |           |     |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------|-----|
| sonetPathCurrentSESSs               | The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in the current 15 minute interval.                                                       | sonetPathCurrentTable        | SONET-MIB | No  |
| sonetPathCurrentCVs                 | The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in the current 15 minute inter val.                                                             | sonetPathCurrentTable        | SONET-MIB | No  |
| sonetPathCurrentUASSs               | The counter associated with the number of Unavailable Seconds encountered by a Path in the current 15 minute interval.                                                                      | sonetPathCurrentTable        | SONET-MIB | No  |
| <b>sonetPathIntervalTable</b>       |                                                                                                                                                                                             |                              |           |     |
| sonetPathIntervalESSs               | The counter associated with the number of Errored Seconds encountered by a SONET/SDH Path in a particular 15-minute interval in the past 24 hours.                                          | sonetPathIntervalTable       | SONET-MIB | Yes |
| sonetPathIntervalSESSs              | The counter associated with the number of Severely Errored Seconds encountered by a SONET/SDH Path in a particular 15-minute interval in the past 24 hours.                                 | sonetPathIntervalTable       | SONET-MIB | Yes |
| sonetPathIntervalCVs                | The counter associated with the number of Coding Violations encountered by a SONET/SDH Path in a particular 15-minute interval in the past 24 hours.                                        | sonetPathIntervalTable       | SONET-MIB | Yes |
| sonetPathIntervalUASSs              | The counter associated with the number of Unavailable Seconds encountered by a Path in a particular 15-minute interval in the past 24 hours.                                                | sonetPathIntervalTable       | SONET-MIB | Yes |
| <b>sonetFarEndPathCurrentTable</b>  |                                                                                                                                                                                             |                              |           |     |
| sonetFarEndPathCurrentESSs          | The counter associated with the number of FarEnd Errored Seconds encountered by a SONET/SDH interface in the current 15 minute interval.                                                    | sonetFarEndPathCurrentTable  | SONET-MIB | No  |
| sonetFarEndPathCurrentSESSs         | The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.                                     | sonetFarEndPathCurrentTable  | SONET-MIB | No  |
| sonetFarEndPathCurrentCVs           | The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in the current 15 minute interval. | sonetFarEndPathCurrentTable  | SONET-MIB | No  |
| sonetFarEndPathCurrentUASSs         | The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in the current 15 minute interval.                                          | sonetFarEndPathCurrentTable  | SONET-MIB | No  |
| <b>sonetFarEndPathIntervalTable</b> |                                                                                                                                                                                             |                              |           |     |
| sonetFarEndPathIntervalESSs         | The counter associated with the number of Far End Errored Seconds encountered by a SONET/SDH Path interface in a particular 15- minute interval in the past 24 hours.                       | sonetFarEndPathIntervalTable | SONET-MIB | No  |

|                              |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|-----------|-----|
| sonetFarEndPathIntervalSESSs | The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET/SDH Path interface in a particular 15-minute interval in the past 24 hours.                                                                                                                                                          | sonetFarEndPathIntervalTable | SONET-MIB | No  |
| sonetFarEndPathIntervalCVs   | The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET/SDH Path interface in a particular 15-minute interval in the past 24 hours.                                                                                                                      | sonetFarEndPathIntervalTable | SONET-MIB | No  |
| sonetFarEndPathIntervalUASs  | The counter associated with the number of Far End Unavailable Seconds encountered by a SONET/SDH Path interface in a particular 15-minute interval in the past 24 hours.                                                                                                                                                               | sonetFarEndPathIntervalTable | SONET-MIB | No  |
| <b>APS-MIB</b>               |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| <b>apsStatusTable</b>        |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| apsStatusModeMismatches      | A count of Mode Mismatch conditions. Modes other than 1+1 unidirectional monitor protection line K2 bit 5, which indicates the architecture and K2 bits 6-8, which indicate if the mode is unidirectional or bidirectional. A conflict between the current local mode and the received K2 mode information constitutes a mode mismatch | apsStatusTable               | APS-MIB   | No  |
| <b>apsChanStatusTable</b>    |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| apsChanSignalDegrades        | A count of Signal Degrade conditions. This condition occurs when the line Bit Error Rate exceeds the currently configured threshold.                                                                                                                                                                                                   | apsChanStatusTable           | APS-MIB   | Yes |
| apsChanSignalFailures        | A count of Signal Failure conditions that have been detected on the incoming signal. This condition occurs when a loss of signal, loss of frame, AIS-L or a Line bit error rate exceeding $10^{-3}$ is detected on an incoming line.                                                                                                   | apsChanStatusTable           | APS-MIB   | Yes |
| apsChanSwitchovers           | The number of times this channel has switched to the protection line. When queried with index value apsChanNumber set to 0, which is the protection line, this object will return 0.                                                                                                                                                   | apsChanStatusTable           | APS-MIB   | Yes |
| <b>ATM-MIB</b>               |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| <b>atmInterfaceTCTable</b>   |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| atmInterfaceOCDEvents        | The number of times the Out of Cell Delineation (OCD) events occur. If seven consecutive ATM cells have Header Error Control (HEC) violations, an OCD event occurs. A high number of OCD events may indicate a problem with the TC Sublayer.                                                                                           | atmInterfaceTCTable          | ATM-MIB   | No  |
| <b>ATM2-MIB</b>              |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| <b>atmSigStatTable</b>       |                                                                                                                                                                                                                                                                                                                                        |                              |           |     |
| atmSigSSCOPConEvents         | SSCOP Connection Events Counter.                                                                                                                                                                                                                                                                                                       | atmSigStatTable              | ATM2-MIB  | No  |
| atmSigSSCOPErrPdus           | SSCOP Errored PDUs Counter.                                                                                                                                                                                                                                                                                                            | atmSigStatTable              | ATM2-MIB  | No  |

|                           |                                                                                                                                                                                                                                                                                                                                                          |                   |              |    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|----|
| atmSigDetectSetupAttempts | Call Setup Attempts Counter. This counter counts the number of call setup attempts (both successful and unsuccessful) detected on this interface.                                                                                                                                                                                                        | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitSetupAttempts   | Call Setup Attempts Counter. This counter counts the number of call setup attempts (both successful and unsuccessful) transmitted on this interface.                                                                                                                                                                                                     | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectUnavailRoutes | Number of Route Unavailability detected on this interface.                                                                                                                                                                                                                                                                                               | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitUnavailRoutes   | Number of Route Unavailability transmitted from this interface.                                                                                                                                                                                                                                                                                          | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectUnavailResrcs | Number of Resource Unavailability detected on this interface.                                                                                                                                                                                                                                                                                            | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitUnavailResrcs   | Number of Resource Unavailability transmitted from this interface.                                                                                                                                                                                                                                                                                       | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectCldPtyEvents  | Number of Called Party Responsible For Unsuccessful Call detected on this interface.                                                                                                                                                                                                                                                                     | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitCldPtyEvents    | Number of Called Party Responsible For Unsuccessful Call transmitted from this interface.                                                                                                                                                                                                                                                                | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectMsgErrors     | Number of Incorrect Messages detected on this interface.                                                                                                                                                                                                                                                                                                 | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitMsgErrors       | Number of Incorrect Messages transmitted on this interface.                                                                                                                                                                                                                                                                                              | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectClgPtyEvents  | Number of Calling Party Events detected on this interface.                                                                                                                                                                                                                                                                                               | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitClgPtyEvents    | Number of Calling Party Events transmitted from this interface.                                                                                                                                                                                                                                                                                          | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectTimerExpires  | Number of Timer Expiries detected on this interface.                                                                                                                                                                                                                                                                                                     | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitTimerExpires    | Number of Timer Expiries transmitted from this interface.                                                                                                                                                                                                                                                                                                | atmSigStatTable   | ATM2-MIB     | No |
| atmSigDetectRestarts      | Number of Restart Activity errors detected on this interface.                                                                                                                                                                                                                                                                                            | atmSigStatTable   | ATM2-MIB     | No |
| atmSigEmitRestarts        | Number of Restart Activity errors transmitted from this interface.                                                                                                                                                                                                                                                                                       | atmSigStatTable   | ATM2-MIB     | No |
| atmSigInEstabls           | Number of SVC VCCs established at this signaling entity for incoming connections.                                                                                                                                                                                                                                                                        | atmSigStatTable   | ATM2-MIB     | No |
| atmSigOutEstabls          | Number of SVC VCCs established at this signaling entity for outgoing connections.                                                                                                                                                                                                                                                                        | atmSigStatTable   | ATM2-MIB     | No |
| <b>ATMF-CES-MIB</b>       |                                                                                                                                                                                                                                                                                                                                                          |                   |              |    |
| <b>atmfCESStatsTable</b>  |                                                                                                                                                                                                                                                                                                                                                          |                   |              |    |
| atmfCESHdrErrors          | The count of the number of AAL1 header errors detected, including those corrected. Header errors include correctable and uncorrectable CRC, plus bad parity.                                                                                                                                                                                             | atmfCESStatsTable | ATMF-CES-MIB | No |
| atmfCESPointerReframes    | This records the count of the number of events in which the AAL1 reassembler found that an SDT pointer is not where it is expected, and the pointer must be reacquired. This count is only meaningful for structured CES modes, as unstructured CES modes do not use pointers. For unstructured CES modes, this count, if present, should indicate zero. | atmfCESStatsTable | ATMF-CES-MIB | No |

|                              |                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |                     |    |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|----|
| atmfCESPointerParityErrors   | This records the count of the number of events in which the AAL1 reassembler detects a parity check failure at the point where a structured data pointer is expected. This count is only meaningful for structured CES modes, as unstructured CES modes do not use pointers. For unstructured CES modes, this count, if present, should indicate zero.                                                                 | atmfCESStatsTable     | ATMF-CES-MIB        | No |
| atmfCESLostCells             | Number of lost cells, as detected by the AAL1 sequence number processing, for example. This records the count of the number of cells detected as lost in the network prior to the destination CES IWF AAL1 layer processing.                                                                                                                                                                                           | atmfCESStatsTable     | ATMF-CES-MIB        | No |
| atmfCESMisinsertedCells      | Number of AAL1 sequence violations which the AAL Convergence sublayer interprets as a misinserted cell, as defined by ITU-T I.363.1.                                                                                                                                                                                                                                                                                   | atmfCESStatsTable     | ATMF-CES-MIB        | No |
| atmfCESBufUnderflows         | Number of buffer underflows. This records the count of the number of times the CES reassembly buffer underflows. In the case of a continuous underflow caused by a loss of ATM cell flow, a single buffer underflow should be counted. If the CES IWF is implemented with multiple buffers (such as a cell level buffer and a bit level buffer), then either buffer underflow will cause this count to be incremented. | atmfCESStatsTable     | ATMF-CES-MIB        | No |
| atmfCESBufOverflows          | Number of buffer overflows. This records the count of the number of times the CES reassembly buffer overflows. If the CES IWF is implemented with multiple buffers (such as a cell level buffer and a bit level buffer), then either buffer overflow will cause this count to be incremented.                                                                                                                          | atmfCESStatsTable     | ATMF-CES-MIB        | No |
| <b>NORTEL-UEMG-ATM-MIB</b>   |                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |                     |    |
| <b>nnAtmStatsIfDataTable</b> |                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |                     |    |
| nnAtmStatsIfInOctets         | Total octets received on this interface                                                                                                                                                                                                                                                                                                                                                                                | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsIfInErrors         | Total inbound errors                                                                                                                                                                                                                                                                                                                                                                                                   | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsIfInProtoError     | Total incoming unknown/unsupported Protocol discards                                                                                                                                                                                                                                                                                                                                                                   | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsIfInOam            | Total incoming OAM cells.                                                                                                                                                                                                                                                                                                                                                                                              | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsIfOutOctets        | Total octets sent on this interface                                                                                                                                                                                                                                                                                                                                                                                    | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsIfOutDiscards      | Total outbound errors                                                                                                                                                                                                                                                                                                                                                                                                  | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsIfOutOam           | Total outgoing OAM cells.                                                                                                                                                                                                                                                                                                                                                                                              | nnAtmStatsIfDataTable | NORTEL-UEMG-ATM-MIB | No |
| <b>nnAtmStatsVcDataTable</b> |                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |                     |    |
| nnAtmStatsVcInTotal          | Total incoming cells (CLP = 0 1).                                                                                                                                                                                                                                                                                                                                                                                      | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsVcInTotalClp0      | Total incoming cells (CLP = 0)                                                                                                                                                                                                                                                                                                                                                                                         | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsVcInDiscarded      | Total incoming cells discarded (CLP = 0 1).                                                                                                                                                                                                                                                                                                                                                                            | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsVcInDiscardedClp0  | Total incoming cells discarded (CLP = 0)                                                                                                                                                                                                                                                                                                                                                                               | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsVcOutTotal         | Total outgoing cells (CLP = 0 1).                                                                                                                                                                                                                                                                                                                                                                                      | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsVcOutTotalClp0     | Total outgoing cells (CLP = 0)                                                                                                                                                                                                                                                                                                                                                                                         | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| nnAtmStatsVcOutTagged        | Total outgoing cells tagged (CLP = 0 - > CLP = 1).                                                                                                                                                                                                                                                                                                                                                                     | nnAtmStatsVcDataTable | NORTEL-UEMG-ATM-MIB | No |
| <b>nnAtmPmVcDataTable</b>    |                                                                                                                                                                                                                                                                                                                                                                                                                        |                       |                     |    |
| nnAtmPmVcFwImpBik            | forward impaired block.                                                                                                                                                                                                                                                                                                                                                                                                | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |

|                              |                                                                                                                                                                                                     |                       |                     |    |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------------------|----|
| nnAtmPmVcFwSeCblkImp         | forward lost/misinserted impaired block.                                                                                                                                                            | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwSeCblkLst         | forward severely errored cell block (lost).                                                                                                                                                         | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwSeCblkMist        | forward severely errored cell block (misinserted).                                                                                                                                                  | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwSeCblkBvlt        | forward severely errored cell block - (BIP-16violations).                                                                                                                                           | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwSeCblkComb        | forward severely errored cell block combined.                                                                                                                                                       | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcLfwstClp01Cnt       | forward lost CLP0+1 cell count.                                                                                                                                                                     | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwLstClp0Cnt        | forward lost CLP0 cell count.                                                                                                                                                                       | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwMistClp01Cnt      | forward misinserted CLP0+1 cell count.                                                                                                                                                              | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwErrCnt            | forward errored cell count.                                                                                                                                                                         | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwTotalLstClp01Cnt  | forward total lost CLP0+1 cell count.                                                                                                                                                               | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcFwTotalLstClp0Cnt   | forward total lost CLP0 cell count.                                                                                                                                                                 | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwImpBik            | backward impaired block.                                                                                                                                                                            | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwSeCblkImp         | backward lost/misinserted impaired block.                                                                                                                                                           | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwSeCblkLst         | backward severely errored cell block (lost).                                                                                                                                                        | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwSeCblkMist        | backward severely errored cell block (misinserted).                                                                                                                                                 | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwSeCblkBvlt        | backward severely errored cell block - (BIP-16 violations).                                                                                                                                         | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwSeCblkCombNsat    | backward severely errored cell block combined(non-saturating).                                                                                                                                      | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwLstClp01Cnt       | backward lost CLP0+1 cell count.                                                                                                                                                                    | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwLstClp0Cnt        | backward lost CLP0 cell count.                                                                                                                                                                      | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwMistClp01Cnt      | backward misinserted CLP0+1 cell count.                                                                                                                                                             | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwErrCnt            | backward errored cell count.                                                                                                                                                                        | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwTotalLstClp01Cnt  | backward total lost CLP01 cell count.                                                                                                                                                               | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcBwTotalLstClp0Cnt   | backward total lost CLP0 cell count.                                                                                                                                                                | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcTotalTransClp01Cnt  | total transmitted CLP0+1 cell count.                                                                                                                                                                | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| nnAtmPmVcTotalTransClp0Cnt   | total transmitted CLP0 cell count.                                                                                                                                                                  | nnAtmPmVcDataTable    | NORTEL-UEMG-ATM-MIB | No |
| <b>ADSL-LINE-MIB</b>         |                                                                                                                                                                                                     |                       |                     |    |
| <b>adslAtucPerfDataTable</b> |                                                                                                                                                                                                     |                       |                     |    |
| adslAtucPerfCurr15MinLofs    | Count of seconds in the current 15 minute interval when there was Loss of Framing.                                                                                                                  | adslAtucPerfDataTable | ADSL-LINE-MIB       | No |
| adslAtucPerfCurr15MinLoss    | Count of seconds in the current 15 minute interval when there was Loss of Signal.                                                                                                                   | adslAtucPerfDataTable | ADSL-LINE-MIB       | No |
| adslAtucPerfCurr15MinLols    | Count of seconds in the current 15 minute interval when there was Loss of Link.                                                                                                                     | adslAtucPerfDataTable | ADSL-LINE-MIB       | No |
| adslAtucPerfCurr15MinLprs    | Count of seconds in the current 15 minute interval when there was Loss of Power.                                                                                                                    | adslAtucPerfDataTable | ADSL-LINE-MIB       | No |
| adslAtucPerfCurr15MinESS     | Count of Errored Seconds in the current 15 minute interval. The errored second parameter is a count of one-second intervals containing one or more CRC anomalies or one or more los or sef defects. | adslAtucPerfDataTable | ADSL-LINE-MIB       | No |
| adslAtucPerfCurr15MinInits   | Count of the line initialization attempts in the current 15 minute interval. Includes both successful and failed attempts.                                                                          | adslAtucPerfDataTable | ADSL-LINE-MIB       | No |
| <b>adslAturPerfDataTable</b> |                                                                                                                                                                                                     |                       |                     |    |

|                                          |                                                                                                                                                                                                      |                           |               |    |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------|----|
| adslAturPerfCurr15MinLofs                | Count of seconds in the current 15 minute interval when there was Loss of Framing.                                                                                                                   | adslAturPerfDataTable     | ADSL-LINE-MIB | No |
| adslAturPerfCurr15MinLoss                | Count of seconds in the current 15 minute interval when there was Loss of Signal.                                                                                                                    | adslAturPerfDataTable     | ADSL-LINE-MIB | No |
| adslAturPerfCurr15MinLprs                | Count of seconds in the current 15 minute interval when there was Loss of Power.                                                                                                                     | adslAturPerfDataTable     | ADSL-LINE-MIB | No |
| adslAturPerfCurr15MinESs                 | Count of Errored Seconds in the current 15 minute interval. The errored second parameter is a count of one-second intervals containing one or more CRC anomalies, or one or more los or sef defects. | adslAturPerfDataTable     | ADSL-LINE-MIB | No |
| <b>adslAtucIntervalTable</b>             |                                                                                                                                                                                                      |                           |               |    |
| adslAtucIntervalLofs                     | Count of seconds in the interval when there was Loss of Framing.                                                                                                                                     | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAtucIntervalLoss                     | Count of seconds in the interval when there was Loss of Signal.                                                                                                                                      | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAtucIntervalLols                     | Count of seconds in the interval when there was Loss of Link.                                                                                                                                        | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAtucIntervalLprs                     | Count of seconds in the interval when there was Loss of Power.                                                                                                                                       | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAtucIntervalESs                      | Count of Errored Seconds in the interval. The errored second parameter is a count of one-second intervals containing one or more CRC anomalies or one or more los or sef defects.                    | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAtucIntervalInits                    | Count of the line initialization attempts during the interval. Includes both successful and failed attempts                                                                                          | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| <b>adslAturIntervalTable</b>             |                                                                                                                                                                                                      |                           |               |    |
| adslAturIntervalLofs                     | Count of seconds in the interval when there was Loss of Framing.                                                                                                                                     | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAturIntervalLoss                     | Count of seconds in the interval when there was Loss of Signal.                                                                                                                                      | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAturIntervalLprs                     | Count of seconds in the interval when there was Loss of Power.                                                                                                                                       | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| adslAturIntervalESs                      | Count of Errored Seconds in the interval. The errored second parameter is a count of one-second intervals containing one or more CRC anomalies, or one or more los or sef defects.                   | adslAtucIntervalTable     | ADSL-LINE-MIB | No |
| <b>adslAtucChanPerfDataTable</b>         |                                                                                                                                                                                                      |                           |               |    |
| adslAtucChanPerfCurr15MinReceivedBlks    | Count of all encoded blocks received on this channel within the current 15 minute interval.                                                                                                          | adslAtucChanPerfDataTable | ADSL-LINE-MIB | No |
| adslAtucChanPerfCurr15MinTransmittedBlks | Count of all encoded blocks transmitted on this channel within the current 15 minute interval.                                                                                                       | adslAtucChanPerfDataTable | ADSL-LINE-MIB | No |
| adslAtucChanPerfCurr15MinCorrectedBlks   | Count of all blocks received with errors that were corrected on this channel within the current 15 minute interval.                                                                                  | adslAtucChanPerfDataTable | ADSL-LINE-MIB | No |
| adslAtucChanPerfCurr15MinUncorrectBlks   | Count of all blocks received with uncorrectable errors on this channel within the current 15 minute interval.                                                                                        | adslAtucChanPerfDataTable | ADSL-LINE-MIB | No |
| <b>adslAturChanPerfDataTable</b>         |                                                                                                                                                                                                      |                           |               |    |
| adslAturChanPerfCurr15MinReceivedBlks    | Count of all encoded blocks received on this channel within the current 15 minute interval.                                                                                                          | adslAturChanPerfDataTable | ADSL-LINE-MIB | No |



|                                                        |                                                                                                                     |                           |                      |    |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------|----------------------|----|
| adslAturChanPerfCurr15MinTransmittedBlks               | Count of all encoded blocks transmitted on this channel within the current 15 minute interval.                      | adslAturChanPerfDataTable | ADSL-LINE-MIB        | No |
| adslAturChanPerfCurr15MinCorrectedBlks                 | Count of all blocks received with errors that were corrected on this channel within the current 15 minute interval. | adslAturChanPerfDataTable | ADSL-LINE-MIB        | No |
| adslAturChanPerfCurr15MinUncorrectBlks                 | Count of all blocks received with uncorrectable errors on this channel within the current 15 minute interval.       | adslAturChanPerfDataTable | ADSL-LINE-MIB        | No |
| <b>adslAtucChanIntervalTable</b>                       |                                                                                                                     |                           |                      |    |
| adslAtucChanIntervalReceivedBlks                       | Count of all encoded blocks received on this channel during this interval.                                          | adslAtucChanIntervalTable | ADSL-LINE-MIB        | No |
| adslAtucChanIntervalTransmittedBlks                    | Count of all encoded blocks transmitted on this channel during this interval.                                       | adslAtucChanIntervalTable | ADSL-LINE-MIB        | No |
| adslAtucChanIntervalCorrectedBlks                      | Count of all blocks received with errors that were corrected on this channel during this interval.                  | adslAtucChanIntervalTable | ADSL-LINE-MIB        | No |
| adslAtucChanIntervalUncorrectBlks                      | Count of all blocks received with uncorrectable errors on this channel during this interval.                        | adslAtucChanIntervalTable | ADSL-LINE-MIB        | No |
| <b>adslAturChanIntervalTable</b>                       |                                                                                                                     |                           |                      |    |
| adslAturChanIntervalReceivedBlks                       | Count of all encoded blocks received on this channel during this interval.                                          | adslAturChanIntervalTable | ADSL-LINE-MIB        | No |
| adslAturChanIntervalTransmittedBlks                    | Count of all encoded blocks transmitted on this channel during this interval.                                       | adslAturChanIntervalTable | ADSL-LINE-MIB        | No |
| adslAturChanIntervalCorrectedBlks                      | Count of all blocks received with errors that were corrected on this channel during this interval.                  | adslAturChanIntervalTable | ADSL-LINE-MIB        | No |
| adslAturChanIntervalUncorrectBlks                      | Count of all blocks received with uncorrectable errors on this channel during this interval.                        | adslAturChanIntervalTable | ADSL-LINE-MIB        | No |
| <b>NORTEL-UEMG-ADSL-MIB<br/>nnUemgDslAtucPerfTable</b> |                                                                                                                     |                           |                      |    |
| nnUemgDslAtucPerfCurr15MinFec                          | Number of Forward Error Correction anomalies on the Atuc Channel in the current 15min interval.                     | nnUemgDslAtucPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinCrc                          | Number of Cyclical Redundancy Check anomalies on the Atuc Channel in the current 15min interval.                    | nnUemgDslAtucPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinNcd                          | Number of No Cell Delineation anomalies on the Atuc Channel in the current 15min interval.                          | nnUemgDslAtucPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinOcd                          | Number of Out of Cell Delineation anomalies on the Atuc Channel in the current 15min interval.                      | nnUemgDslAtucPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinHec                          | Number of Header Error Check anomalies which on the Atuc Channel in the current 15min interval.                     | nnUemgDslAtucPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinLcd                          | Number of Loss of Cell Delineation anomalies on the Atuc Channel in the current 15min interval.                     | nnUemgDslAtucPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| <b>nnUemgDslAturPerfTable</b>                          |                                                                                                                     |                           |                      |    |
| nnUemgDslAturPerfCurr15MinFec                          | Number of Forward Error Correction anomalies on the ATUR Channel in the current 15min interval.                     | nnUemgDslAturPerfTable    | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAturPerfCurr15MinBlockError                   | Number of Block Error anomalies which occurred on the ATUR Channel in the current 15min interval.                   | nnUemgDslAturPerfTable    | NORTEL-UEMG-ADSL-MIB | No |

|                                   |                                                                                                                                                                                    |                        |                      |    |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------|----|
| nnUemgDslAtucPerfCurr15MinNcd     | Number of No Cell Delineation anomalies on the ATUR Channel in the current 15min interval.                                                                                         | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinOcd     | Number of Out of Cell Delineation anomalies on the ATUR Channel in the current 15min interval.                                                                                     | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinHec     | Number of Header Error Check anomalies which on the ATUR Channel in the current 15min interval.                                                                                    | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCurr15MinLcd     | Number of Loss of Cell Delineation anomalies on the ATUR Channel in the current 15min interval.                                                                                    | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| <b>nnUemgDslAtucIntervalTable</b> |                                                                                                                                                                                    |                        |                      |    |
| nnUemgDslAtucPerfFec              | Number of Forward Error Correction anomalies on the ATUC channel during this interval.                                                                                             | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfCrc              | Number of Cyclical Redundancy Check anomalies on the ATUC channel during this interval.                                                                                            | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfNcd              | Number of No Cell Delineation anomalies which on the ATUC channel during this interval.                                                                                            | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfOcd              | Number of Out of Cell Delineation anomalies which on the ATUC channel during this interval.                                                                                        | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfHec              | Number of Header Error Check anomalies which on the ATUC channel during this interval.                                                                                             | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfLcd              | Number of Loss of Cell Delineation anomalies on the ATUC channel during this interval.                                                                                             | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| <b>nnUemgDslAturIntervalTable</b> |                                                                                                                                                                                    |                        |                      |    |
| nnUemgDslAtucPerfFec              | Number of Forward Error Correction anomalies on the ATUC channel during this interval.                                                                                             | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAturPerfBlockError       | Number of Block Error anomalies which occurred on the ATUR channel during this interval.                                                                                           | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfNcd              | Number of No Cell Delineation anomalies which on the ATUC channel during this interval.                                                                                            | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfOcd              | Number of Out of Cell Delineation anomalies which on the ATUC channel during this interval.                                                                                        | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfHec              | Number of Header Error Check anomalies which on the ATUC channel during this interval.                                                                                             | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| nnUemgDslAtucPerfLcd              | Number of Loss of Cell Delineation anomalies on the ATUC channel during this interval.                                                                                             | nnUemgDslAturPerfTable | NORTEL-UEMG-ADSL-MIB | No |
| <b>IMA-MIB (new in SN05)</b>      |                                                                                                                                                                                    |                        |                      |    |
| <b>imaGroupCurrentTable</b>       |                                                                                                                                                                                    |                        |                      |    |
| imaGroupCurrentUnavailSecs        | Count of one second intervals where the IMA Group Traffic State Machine is Down in current 15 minute interval                                                                      | imaGroupCurrentTable   | IMA-MIB              | No |
| imaGroupCurrentNeNumFailures      | The number of times a near-end group failure (Config-Aborted, Insufficient-Links) has been reported in current 15 minute interval                                                  | imaGroupCurrentTable   | IMA-MIB              | No |
| imaGroupCurrentFeNumFailures      | The number of times a far-end group failure (Config-Aborted-FE, Insufficient-Links-FE, Blocked-FE) has been reported in current 15 minute interval. This is an optional attribute. | imaGroupCurrentTable   | IMA-MIB              | No |
| <b>imaGroupIntervalTable</b>      |                                                                                                                                                                                    |                        |                      |    |

|                                |                                                                                                                                                                                                                                                             |                       |         |     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|---------|-----|
| imaGroupIntervalUnavailSecs    | Count of one second intervals where the IMA Group Traffic State Machine is Down in one of the previous 96, individual 15 minute, intervals                                                                                                                  | imaGroupIntervalTable | IMA-MIB | Yes |
| imaGroupIntervalNeNumFailures  | The number of times a near-end group failure (Config-Aborted, Insufficient-Links) has been reported in one of the previous 96, individual 15 minute, intervals                                                                                              | imaGroupIntervalTable | IMA-MIB | Yes |
| imaGroupIntervalFeNumFailures  | The number of times a far-end group failure (Config-Aborted-FE, Insufficient-Links-FE, Blocked-FE) has been reported in one of the previous 96, individual 15 minute, intervals. This is an optional attribute                                              | imaGroupIntervalTable | IMA-MIB | No  |
| <b>imaGroupTotalTable</b>      |                                                                                                                                                                                                                                                             |                       |         |     |
| imaGroupTotalUnavailSecs       | Count of one second intervals where the IMA Group Traffic State Machine is Down in the previous 24 hour interval. Invalid 15 minute intervals count as 0.                                                                                                   | imaGroupTotalTable    | IMA-MIB | No  |
| imaGroupTotalNeNumFailures     | The number of times a near-end group failure (Config-Aborted, Insufficient-Links) has been reported in the previous 24 hour. interval. Invalid 15 minute intervals count as 0.                                                                              | imaGroupTotalTable    | IMA-MIB | No  |
| imaGroupTotalFeNumFailures     | The number of times a far-end group failure (Config-Aborted-FE, Insufficient-Links-FE, Blocked-FE) has been reported in the previous 24 hour interval. Invalid 15 minute intervals count as 0. This is an optional attribute.                               | imaGroupTotalTable    | IMA-MIB | No  |
| <b>imaLinkCurrentTable</b>     |                                                                                                                                                                                                                                                             |                       |         |     |
| imaLinkCurrentImaViolations    | ICP violations: count of errored, invalid or missing ICP cells, except during SES-IMA or UAS-IMA conditions, in the current 15 minute interval                                                                                                              | imaLinkCurrentTable   | IMA-MIB | No  |
| imaLinkCurrentOifAnomalies     | The number of OIF anomalies, except during SES-IMA or UAS-IMA conditions, at the near-end in the current 15 minute interval. This is an optional attribute                                                                                                  | imaLinkCurrentTable   | IMA-MIB | No  |
| imaLinkCurrentNeSevErroredSecs | Count of one second intervals containing $\geq 30\%$ of the ICP cells counted as IV-IMAs, or one or more link defects (e. g., LOS, OOF/ LOF, AIS, or LCD), LIF defects, or LODS defects, except during UAS-IMA condition, in the current 15 minute interval | imaLinkCurrentTable   | IMA-MIB | No  |
| imaLinkCurrentFeSevErroredSecs | Count of one second intervals containing one or more RDI-IMA defects, except during UAS-IMA-FE condition, in the current 15 minute interval                                                                                                                 | imaLinkCurrentTable   | IMA-MIB | No  |
| imaLinkCurrentNeUnavailSecs    | Count of unavailable seconds at near-end in the current 15 minute interval: unavailability begins at the onset of 10 contiguous SES-IMA and ends at the onset of 10 contiguous seconds with no SES-IMA                                                      | imaLinkCurrentTable   | IMA-MIB | No  |

|                                |                                                                                                                                                                                                                                 |                      |         |     |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|-----|
| imaLinkCurrentFeUnavailSecs    | Count of unavailable seconds at far-end in the current 15 minute interval: unavailability begins at the onset of 10 contiguous SES-IMA-FE and ends at the onset of 10 contiguous seconds with no SES-IMA-FE                     | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentNeTxUnusableSecs | Tx Unusable seconds: count of Unusable seconds at the near-end Tx LSM in the current 15 minute interval                                                                                                                         | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentNeRxUnusableSecs | Rx Unusable seconds: count of Unusable seconds at the near-end Rx LSM in the current 15 minute interval                                                                                                                         | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentFeTxUnusableSecs | Tx Unusable seconds at far-end: count of seconds with Tx Unusable indications from the far-end Tx LSM in the current 15 minute interval                                                                                         | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentFeRxUnusableSecs | Rx Unusable seconds at far-end: count of seconds with Rx Unusable indications from the far-end Rx LSM in the current 15 minute interval                                                                                         | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentNeTxNumFailures  | The number of times a near-end transmit failure alarm condition has been entered on this link (i.e., some form of implementation specific transmit fault) in the current 15 minute interval                                     | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentNeRxNumFailures  | The number of times a near-end receive failure alarm condition has been entered on this link (i.e., LIF, LODS, RFI-IMA, Mis-Connected, or some form of implementation specific receive fault) in the current 15 minute interval | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentFeTxNumFailures  | The number of times a far-end transmit failure alarm condition has been entered on this link (i.e., Tx-Unusable-FE) in the current 15 minute interval. This is an optional attribute                                            | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentFeRxNumFailures  | The number of times a far-end receive failure alarm condition has been entered on this link (i.e., Rx-Unusable-FE) in the current 15 minute interval. This is an optional attribute                                             | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentTxStuffs         | Count of stuff events inserted in the transmit direction in the current 15 minute interval. This is an optional attribute                                                                                                       | imaLinkCurrentTable  | IMA-MIB | No  |
| imaLinkCurrentRxStuffs         | Count of stuff events detected in the receive direction in the current 15 minute interval. This is an optional attribute                                                                                                        | imaLinkCurrentTable  | IMA-MIB | No  |
| <b>imaLinkIntervalTable</b>    |                                                                                                                                                                                                                                 |                      |         |     |
| imaLinkIntervalImaViolations   | ICP violations: count of errored, invalid or missing ICP cells, except during SES-IMA or UAS-IMA conditions, in one of the previous 96, individual 15 minute, intervals                                                         | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalOifAnomalies    | The number of OIF anomalies, except during SES-IMA or UAS-IMA conditions, at the near-end in one of the previous 96, individual 15 minute, intervals. This is an optional attribute                                             | imaLinkIntervalTable | IMA-MIB | Yes |

|                                 |                                                                                                                                                                                                                                                                                      |                      |         |     |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|-----|
| imaLinkIntervalNeSevErroredSecs | Count of one second intervals containing $\geq 30\%$ of the ICP cells counted as IV-IMAs, or one or more link defects (e. g., LOS, OOF/ LOF, AIS, or LCD), LIF defects, or LODS defects, except during UAS-IMA condition, in one of the previous 96, individual 15 minute, intervals | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalFeSevErroredSecs | Count of one second intervals containing one or more RDI-IMA defects, except during UAS-IMA-FE condition, in one of the previous 96, individual 15 minute, intervals                                                                                                                 | imaLinkIntervalTable | IMA-MIB | No  |
| imaLinkIntervalNeUnavailSecs    | Count of unavailable seconds at near-end in one of the previous 96, individual 15 minute, intervals: unavailability begins at the onset of 10 contiguous SES-IMA and ends at the onset of 10 contiguous seconds with no SES-IMA                                                      | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalFeUnavailSecs    | Count of unavailable seconds at far-end in one of the previous 96, individual 15 minute, intervals: unavailability begins at the onset of 10 contiguous SES-IMA-FE and ends at the onset of 10 contiguous seconds with no SES-IMA-FE                                                 | imaLinkIntervalTable | IMA-MIB | No  |
| imaLinkIntervalNeTxUnusableSecs | Tx Unusable seconds: count of Unusable seconds at the near-end Tx LSM in one of the previous 96, individual 15 minute, intervals                                                                                                                                                     | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalNeRxUnusableSecs | Rx Unusable seconds: count of Unusable seconds at the near-end Rx LSM in one of the previous 96, individual 15 minute, intervals                                                                                                                                                     | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalFeTxUnusableSecs | Tx Unusable seconds at far-end: count of seconds with Tx Unusable indications from the far-end Tx LSM in one of the previous 96, individual 15 minute, intervals                                                                                                                     | imaLinkIntervalTable | IMA-MIB | No  |
| imaLinkIntervalFeRxUnusableSecs | Rx Unusable seconds at far-end: count of seconds with Rx Unusable indications from the far-end Rx LSM in one of the previous 96, individual 15 minute, intervals.                                                                                                                    | imaLinkIntervalTable | IMA-MIB | No  |
| imaLinkIntervalNeTxNumFailures  | The number of times a near-end transmit failure alarm condition has been entered on this link (i.e., some form of implementation specific transmit fault) in one of the previous 96, individual 15 minute, intervals                                                                 | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalNeRxNumFailures  | The number of times a near-end receive failure alarm condition has been entered on this link (i.e., LIF, LODS, RFI-IMA, Mis-Connected, or some form of implementation specific receive fault) in one of the previous 96, individual 15 minute, intervals                             | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalFeTxNumFailures  | The number of times a far-end transmit failure alarm condition has been entered on this link (i.e., Tx-Unusable-FE) in one of the previous 96, individual 15 minute, intervals. This is an optional attribute                                                                        | imaLinkIntervalTable | IMA-MIB | No  |

|                                |                                                                                                                                                                                                                                                       |                      |         |     |
|--------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|---------|-----|
| imaLinkIntervalFeRxNumFailures | The number of times a far-end receive failure alarm condition has been entered on this link (i.e., Rx-Unusable-FE) in one of the previous 96, individual 15 minute, intervals. This is an optional attribute                                          | imaLinkIntervalTable | IMA-MIB | No  |
| imaLinkIntervalTxStuffs        | Count of stuff events inserted in the transmit direction in one of the previous 96, individual 15 minute, intervals. This is an optional attribute                                                                                                    | imaLinkIntervalTable | IMA-MIB | Yes |
| imaLinkIntervalRxStuffs        | Count of stuff events detected in the receive direction in one of the previous 96, individual 15 minute, intervals. This is an optional attribute                                                                                                     | imaLinkIntervalTable | IMA-MIB | Yes |
| <b>imaLinkTotalTable</b>       |                                                                                                                                                                                                                                                       |                      |         |     |
| imaLinkTotalImaViolations      | ICP violations: count of errored, invalid or missing ICP cells, except during SES-IMA or UAS-IMA conditions, in the previous 24 hour interval                                                                                                         | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalOifAnomalies       | The number of OIF anomalies, except during SES-IMA or UAS-IMA conditions, at the near-end in the previous 24 hour interval. This is an optional attribute                                                                                             | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalNeSevErroredSecs   | Count of one second intervals containing >= 30% of the ICP cells counted as IV-IMAs, or one or more link defects (e. g., LOS, OOF/ LOF, AIS, or LCD), LIF defects, or LODS defects, except during UAS-IMA condition, in the previous 24 hour interval | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalFeSevErroredSecs   | Count of one second intervals containing one or more RDI-IMA defects, except during UAS-IMA-FE condition, in the previous 24 hour interval                                                                                                            | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalNeUnavailSecs      | Count of unavailable seconds at near-end in the previous 24 hour interval: unavailability begins at the onset of 10 contiguous SES-IMA and ends at the onset of 10 contiguous seconds with no SES-IMA                                                 | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalFeUnavailSecs      | Count of unavailable seconds at far-end in the previous 24 hour interval: unavailability begins at the onset of 10 contiguous SES-IMA-FE and ends at the onset of 10 contiguous seconds with no SES-IMA-FE                                            | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalNeTxUnusableSecs   | Tx Unusable seconds: count of Unusable seconds at the near-end Tx LSM in the previous 24 hour interval                                                                                                                                                | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalNeRxUnusableSecs   | Rx Unusable seconds: count of Unusable seconds at the near-end Rx LSM in the previous 24 hour interval                                                                                                                                                | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalFeTxUnusableSecs   | Tx Unusable seconds at far-end: count of seconds with Tx Unusable indications from the far-end Tx LSM in the previous 24 hour interval                                                                                                                | imaLinkTotalTable    | IMA-MIB | No  |
| imaLinkTotalFeRxUnusableSecs   | Rx Unusable seconds at far-end: count of seconds with Rx Unusable indications from the far-end Rx LSM in the previous 24 hour interval                                                                                                                | imaLinkTotalTable    | IMA-MIB | No  |

|                              |                                                                                                                                                                                                                                |                       |                  |     |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------------|-----|
| imaLinkTotalNeTxNumFailures  | The number of times a near-end transmit failure alarm condition has been entered on this link (i.e., some form of implementation specific transmit fault) in the previous 24 hour interval                                     | imaLinkTotalTable     | IMA-MIB          | No  |
| imaLinkTotalNeRxNumFailures  | The number of times a near-end receive failure alarm condition has been entered on this link (i.e., LIF, LODS, RFI-IMA, Mis-Connected, or some form of implementation specific receive fault) in the previous 24 hour interval | imaLinkTotalTable     | IMA-MIB          | No  |
| imaLinkTotalFeTxNumFailures  | The number of times a far-end transmit failure alarm condition has been entered on this link (i.e., Tx-Unusable-FE) in the previous 24 hour interval. This is an optional attribute                                            | imaLinkTotalTable     | IMA-MIB          | No  |
| imaLinkTotalFeRxNumFailures  | The number of times a far-end receive failure alarm condition has been entered on this link (i.e., Rx-Unusable-FE) in the previous 24 hour interval. This is an optional attribute                                             | imaLinkTotalTable     | IMA-MIB          | No  |
| imaLinkTotalTxStuffs         | Count of stuff events inserted in the transmit direction in the previous 24 hour interval. This is an optional attribute                                                                                                       | imaLinkTotalTable     | IMA-MIB          | No  |
| imaLinkTotalRxStuffs         | Count of stuff events detected in the receive direction in the previous 24 hour interval. This is an optional attribute                                                                                                        | imaLinkTotalTable     | IMA-MIB          | No  |
| <b>UEMG-PERFMON-MIB</b>      |                                                                                                                                                                                                                                |                       |                  |     |
| <b>nnPmUtilOmRecentTable</b> | This table contains measurements of CPU, Ram, Flash and Channel Usage. Measurements in this table are rolling (peak and average values) on the most recent 15 minutes.                                                         |                       |                  |     |
| nnPmUtilRecentCpuPeak        | Peak CPU Occupancy (as a percentage of usage)                                                                                                                                                                                  | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentCpuAvg         | Average CPU Occupancy (as a percentage of usage)                                                                                                                                                                               | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentRamPeak        | Peak RAM Usage (as a percentage of usage)                                                                                                                                                                                      | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentRamAvg         | Average RAM Usage (as a percentage of usage)                                                                                                                                                                                   | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentFlashPeak      | Peak Flash Memory Usage (as a percentage of usage)                                                                                                                                                                             | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentFlashAvg       | Average Flash Memory Usage (as a percentage of usage)                                                                                                                                                                          | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentChanPeak       | Peak Channel Usage (as a percentage of usage)                                                                                                                                                                                  | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| nnPmUtilRecentChanAvg        | Average Channel Usage (as a percentage of usage)                                                                                                                                                                               | nnPmUtilOmRecentTable | UEMG-PERFMON-MIB | No  |
| <b>nnPmUtilOmIntervTable</b> | This table contains history measurements of CPU, Ram, Flash and Channel Usage. Measurements in this table are rolling (peak and average values) of each 15 minute interval up to 24 hours old.                                 |                       |                  |     |
| nnPmUtilIntervCpuPeak        | Peak CPU Occupancy (as a percentage of usage)                                                                                                                                                                                  | nnPmUtilOmIntervTable | UEMG-PERFMON-MIB | Yes |
| nnPmUtilIntervCpuAvg         | Average CPU Occupancy (as a percentage of usage)                                                                                                                                                                               | nnPmUtilOmIntervTable | UEMG-PERFMON-MIB | Yes |
| nnPmUtilIntervRamPeak        | Peak RAM Usage (as a percentage of usage)                                                                                                                                                                                      | nnPmUtilOmIntervTable | UEMG-PERFMON-MIB | Yes |

|                                 |                                                                                                                                                                                                                 |                           |                  |     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|------------------|-----|
| nnPmUtilIntervRamAvg            | Average RAM Usage (as a percentage of usage)                                                                                                                                                                    | nnPmUtilOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmUtilIntervFlashPeak         | Peak Flash Memory Usage (as a percentage of usage)                                                                                                                                                              | nnPmUtilOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmUtilIntervFlashAvg          | Average Flash Memory Usage (as a percentage of usage)                                                                                                                                                           | nnPmUtilOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmUtilIntervChanPeak          | Peak Channel Usage (as a percentage of usage)                                                                                                                                                                   | nnPmUtilOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmUtilIntervChanAvg           | Average Channel Usage (as a percentage of usage)                                                                                                                                                                | nnPmUtilOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmSnmpRecentRequestsPeak      | The Peak number of SNMP Requests/PDUs in the most recent 15 minutes. These are accumulated on 1-minute cycles.                                                                                                  | N/A                       | UEMG-PERFMON-MIB | No  |
| nnPmSnmpRecentRequestsAvg       | The average number of SNMP Requests/PDUs in the most recent 15 minutes. These are accumulated on 1-minute cycles. Thus, the average is the average of the last 15 x 1-minute cycles.                            | N/A                       | UEMG-PERFMON-MIB | No  |
| nnPmSnmpRecentNotifsPeak        | The Peak number of SNMP Notifications sent in the most recent 15 minutes. These are accumulated on 1-minute cycles.                                                                                             | N/A                       | UEMG-PERFMON-MIB | No  |
| nnPmSnmpRecentNotifsAvg         | The average number of SNMP Notifications sent in the most recent 15 minutes. These are accumulated on 1-minute cycles. Thus, the average is the average of the last 15 x 1-minute cycles.                       | N/A                       | UEMG-PERFMON-MIB | No  |
| <b>nnPmSnmpOmIntervTable</b>    | This table contains measurements of SNMP requests and events. Measurements in this table are rolling (peak and average values) of each 15 minute interval up to 24 hours old.                                   |                           |                  |     |
| nnPmSnmplIntervReqPeak          | The Peak number of SNMP Requests/PDUs in the most Recent 15 mins. These are accumulated on 1-minute cycles.                                                                                                     | nnPmSnmpOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmSnmplIntervReqAvg           | The Avg number of SNMP Requests/PDUs in the most Recent 15 mins. These are accumulated on 1-minute cycles. Thus, the avg is the avg of the last 15x 1-minute cycles. Precision is tenths, thus 816 is 81.6      | nnPmSnmpOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmSnmplIntervNotifPeak        | The Peak number of SNMP Notifications in the most Recent 15 mins. These are accumulated on 1-minute cycles.                                                                                                     | nnPmSnmpOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmSnmplIntervNotifAvg         | The Avg number of SNMP Notifications sent in the most Recent 15 mins. These are accumulated on 1-minute cycles. Thus, the avg is the avg of the last 15x 1-minute cycles. Precision is tenths, thus 816 is 81.6 | nnPmSnmpOmIntervTable     | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervTable       |                                                                                                                                                                                                                 |                           | UEMG-PERFMON-MIB |     |
| nnPmOvldRscDccIntervPduRatePeak | Peak # received AAL5 PDUs per sec for this 15 minute interval                                                                                                                                                   | nnPmOvldRscDccIntervTable | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervPduRateAvg  | Avg num recvd AAL5 PDUs per sec for this 15 minute interval                                                                                                                                                     | nnPmOvldRscDccIntervTable | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervCbvMsgRPeak | Peak recvd conn request msgs per sec for this 15 minute interval                                                                                                                                                | nnPmOvldRscDccIntervTable | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervCbvMsgRAvg  | Avg conn request msgs per sec for this 15 minute interval                                                                                                                                                       | nnPmOvldRscDccIntervTable | UEMG-PERFMON-MIB | Yes |



|                                    |                                                                                                                                                                                                     |                             |                  |     |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------|-----|
| nnPmOvldRscDccIntervConQDelPeak    | Milliseconds...peak time a connRequest is pending in its queue for this 15 minute interval                                                                                                          | nnPmOvldRscDccIntervTable   | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervConQDelAvg     | Milliseconds...Avg time a connRequest is pending in its queue for this 15 minute interval                                                                                                           | nnPmOvldRscDccIntervTable   | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervCpuUtilPeak    | Peak cpu occupancy for this 15 minute interval                                                                                                                                                      | nnPmOvldRscDccIntervTable   | UEMG-PERFMON-MIB | Yes |
| nnPmOvldRscDccIntervCpuUtilAvg     | Avg cpu occupancy this 15 minute interval                                                                                                                                                           | nnPmOvldRscDccIntervTable   | UEMG-PERFMON-MIB | Yes |
| <b>nnPmOvldConnDenyIntervTable</b> |                                                                                                                                                                                                     |                             |                  |     |
| nnPmOvldConnDenyIntervCount        | Count of the number of Connection requests Denied for this 15 minute interval                                                                                                                       | nnPmOvldConnDenyIntervTable | UEMG-PERFMON-MIB | Yes |
| <b>DS3-MIB</b>                     |                                                                                                                                                                                                     |                             |                  |     |
| <b>dsx3CurrentTable</b>            |                                                                                                                                                                                                     |                             |                  |     |
| dsx3CurrentPESs                    | The counter associated with the number of P - bit Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                               | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentPSESs                   | The counter associated with the number of P - bit Severely Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                      | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentSEFSs                   | The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                      | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentUASs                    | The counter associated with the number of Unavailable Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                                   | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentPCVs                    | The counter associated with the number of P - bit Coding Violations encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                             | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentCCVs                    | The counter associated with the number of C - bit Coding Violations encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                             | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentCESs                    | The counter associated with the number of C - bit Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                               | dsx3CurrentTable            | DS3 - MIB        | No  |
| dsx3CurrentCSESs                   | The counter associated with the number of C - bit Severely Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                      | dsx3CurrentTable            | DS3 - MIB        | No  |
| <b>dsx3IntervalTable</b>           |                                                                                                                                                                                                     |                             |                  |     |
| dsx3IntervalPESs                   | The counter associated with the number of P - bit Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                               | dsx3IntervalTable           | DS3 - MIB        | No  |
| dsx3IntervalPSESs                  | The counter associated with the number of P - bit Severely Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval in the past 24 hours. | dsx3IntervalTable           | DS3 - MIB        | No  |

|                                |                                                                                                                                                                                                                           |                         |           |    |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------|----|
| dsx3IntervalSEFSs              | The counter associated with the number of Severely Errored Framing Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval in the past 24 hours.                       | dsx3IntervalTable       | DS3 - MIB | No |
| dsx3IntervalUASs               | The counter associated with the number of Unavailable Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval in the past 24 hours                                     | dsx3IntervalTable       | DS3 - MIB | No |
| dsx3IntervalPCVs               | The counter associated with the number of P - bit Coding Violations encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval in the past 24 hours.                              | dsx3IntervalTable       | DS3 - MIB | No |
| dsx3IntervalCCVs               | The counter associated with the number of C - bit Coding Violations encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval in the past 24 hours.                              | dsx3IntervalTable       | DS3 - MIB | No |
| dsx3IntervalCESs               | The counter associated with the number of C - bit Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval.                                                     | dsx3IntervalTable       | DS3 - MIB | No |
| dsx3IntervalCSEs               | The counter associated with the number of C - bit Severely Errored Seconds encountered by a SONET ( STS1 with DS3 payload selected) Section in the current 15 minute interval in the past 24 hours.                       | dsx3IntervalTable       | DS3 - MIB | No |
| <b>dsx3FarEndCurrentTable</b>  |                                                                                                                                                                                                                           |                         |           |    |
| dsx3FarEndCurrentCESs          | The counter associated with the number of FarEnd Errored Seconds encountered by a SONET (STS1 with DS3 payload selected) interface in the current 15 minute interval.                                                     | dsx3FarEndCurrentTable  | DS3 - MIB | No |
| dsx3FarEndCurrentCSEs          | The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET (STS1 with DS3 payload selected) Path interface in the current 15 minute interval.                                      | dsx3FarEndCurrentTable  | DS3 - MIB | No |
| dsx3FarEndCurrentCCVs          | The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET (STS1 with DS3 payload selected)) Path interface in the current 15 minute interval. | dsx3FarEndCurrentTable  | DS3 - MIB | No |
| dsx3FarEndCurrentUASs          | The counter associated with the number of Far End Unavailable Seconds encountered by a SONET (STS1 with DS3 payload selected) Path interface in the current 15 minute interval.                                           | dsx3FarEndCurrentTable  | DS3 - MIB | No |
| <b>dsx3FarEndIntervalTable</b> |                                                                                                                                                                                                                           |                         |           |    |
| dsx3FarEndIntervalCESs         | The counter associated with the number of Far End Errored Seconds encountered by a SONET (STS1 with DS3 payload selected) Path interface in a particular 15- minute interval in the past 24 hours.                        | dsx3FarEndIntervalTable | DS3 - MIB | No |

|                                       |                                                                                                                                                                                                                                                |                                |                          |     |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|--------------------------|-----|
| dsx3FarEndIntervalCSEss               | The counter associated with the number of Far End Severely Errored Seconds encountered by a SONET (STS1 with DS3 payload selected) Path interface in a particular 15-minute interval in the past 24 hours.                                     | dsx3FarEndIntervalTable        | DS3 - MIB                | No  |
| dsx3FarEndIntervalCCVs                | The counter associated with the number of Far End Coding Violations reported via the far end block error count encountered by a SONET (STS1 with DS3 payload selected) Path interface in a particular 15-minute interval in the past 24 hours. | dsx3FarEndIntervalTable        | DS3 - MIB                | No  |
| dsx3FarEndIntervalUASs                | The counter associated with the number of Far End Unavailable Seconds encountered by a SONET (STS1 with DS3 payload selected) Path interface in a particular 15-minute interval in the past 24 hours.                                          | dsx3FarEndIntervalTable        | DS3 - MIB                | No  |
| <b>NORTEL-UEMG-REMSGING-MIB</b>       |                                                                                                                                                                                                                                                |                                |                          |     |
| <b>nnRelMsgSctpAssocOmCurrTable</b>   |                                                                                                                                                                                                                                                |                                |                          |     |
| nnRelMsgSctpAscCurrClosed             | number of times that this association closed (both aborts and shutdowns)                                                                                                                                                                       | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscCurrAbort              | number of times that this association aborted.                                                                                                                                                                                                 | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscCurrOutPacks           | number of packets transmitted                                                                                                                                                                                                                  | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrInPacks            | number of packets received, this association                                                                                                                                                                                                   | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrDiscPacks          | number of packets discarded by this association.                                                                                                                                                                                               | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrRetranPacks        | number of packets retransmitted by this association, this interval                                                                                                                                                                             | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrT1expires          | number of T1 Expires                                                                                                                                                                                                                           | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrT2expires          | number of T2 expires.                                                                                                                                                                                                                          | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrT3expires          | number of T3 expires                                                                                                                                                                                                                           | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrCongCount          | number of times this assoc entered congestion.                                                                                                                                                                                                 | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| nnRelMsgSctpAscCurrCongCleared        | number of times congestion cleared by audit.                                                                                                                                                                                                   | nnRelMsgSctpAssocOmCurrTable   | NORTEL-UEMG-REMSGING-MIB | No  |
| <b>nnRelMsgSctpAssocOmIntervTable</b> |                                                                                                                                                                                                                                                |                                |                          |     |
| nnRelMsgSctpAscIntervClosed           | number of times that this association closed (both aborts and shutdowns)                                                                                                                                                                       | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervAbort            | number of times that this association aborted.                                                                                                                                                                                                 | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervOutPacks         | number of packets transmitted                                                                                                                                                                                                                  | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervInPacks          | number of packets received, this association                                                                                                                                                                                                   | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervDiscPacks        | number of packets discarded by this association.                                                                                                                                                                                               | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervRetranPacks      | number of packets retransmitted by this association, this interval                                                                                                                                                                             | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervT1expires        | number of T1 Expires                                                                                                                                                                                                                           | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervT2expires        | number of T2 expires.                                                                                                                                                                                                                          | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervT3expires        | number of T3 expires                                                                                                                                                                                                                           | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| nnRelMsgSctpAscIntervCongCount        | number of times this assoc entered congestion.                                                                                                                                                                                                 | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |

|                                  |                                                                                           |                                |                          |     |
|----------------------------------|-------------------------------------------------------------------------------------------|--------------------------------|--------------------------|-----|
| nnRelMsgSctpAscIntervCongCleared | number of times congestion cleared by audit.                                              | nnRelMsgSctpAssocOmIntervTable | NORTEL-UEMG-REMSGING-MIB | Yes |
| <b>NORTEL-UEMG-GIGE_mib</b>      |                                                                                           |                                |                          |     |
| <b>nnGLinkOmCurrTable</b>        |                                                                                           |                                |                          |     |
| nnGLinkCurrESs                   | current Errored Seconds                                                                   | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrSESs                  | current Severely Errored Seconds                                                          | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrUASs                  | current Unavailable Seconds                                                               | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrOPT                   | current Optical Transmit Current                                                          | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrOPR                   | current Optical Power Receive                                                             | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrTBC                   | current Transmit Bus Current                                                              | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrVCC                   | current Voltage                                                                           | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrTEMP                  | current Temperature                                                                       | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrTxFifoOverruns        | current Transmit Fifo Overruns                                                            | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrTxFifoUnderruns       | current Transmit Fifo Underruns                                                           | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrTxBytesOverflow       | current Transmit Bytes, Overflow                                                          | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrTxBytes               | current Transmit Bytes                                                                    | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrRxFcsFail             | current Receive Fcs Failures                                                              | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrRxLenTypeFail         | current Receive LEN Type Failures                                                         | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrRxGoodPause           | current Receive Good Pause                                                                | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrRxBadOpCntlFrames     | current Receive Bad Opcode Control Frames                                                 | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrRxControlFrames       | current Receive Control Frames                                                            | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkCurrRxPauseFrames         | current Receive Pause Frames                                                              | nnGLinkOmCurrTable             | NORTEL-UEMG-GIGE_mib     |     |
| <b>nnGLinkOmIntervTable</b>      |                                                                                           |                                |                          |     |
| nnGLinkIntervESs                 | history, nth interval Errored Seconds                                                     | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervSESs                | history, nth interval Severely Errored Seconds                                            | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervUASs                | history, nth interval Unavailable Seconds                                                 | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervOPT                 | history, nth interval Optical Transmit Current                                            | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervOPR                 | history, nth interval Optical Power Receive                                               | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervTBC                 | history, nth interval Transmit Bus Current                                                | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervVCC                 | history, nth interval Voltage                                                             | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervTEMP                | history, nth interval Temperature                                                         | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervTxFifoOverruns      | history, nth interval Transmit Fifo Overruns                                              | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervTxFifoUnderruns     | history, nth interval Transmit Fifo Underruns                                             | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervTxBytesOverflow     | history, nth interval Transmit Bytes, Overflow                                            | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervTxBytes             | history, nth interval Transmit Bytes                                                      | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervRxFcsFail           | history, nth interval Receive Fcs Failures                                                | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervRxLenTypeFail       | history, nth interval Receive LEN Type Failures                                           | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervRxGoodPause         | history, nth interval Receive Good Pause                                                  | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervRxBadOpCntlFrames   | history, nth interval Receive Bad Opcode Control Frames                                   | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkIntervRxControlFrames     | history, nth interval Receive Control Frames                                              | nnGLinkOmIntervTable           | NORTEL-UEMG-GIGE_mib     |     |
| <b>nnGLinkThresholdTable</b>     |                                                                                           |                                |                          |     |
| nnGLinkThreshType                | Threshold Type...The Performance Measure, Counter to which the following thresholds apply | nnGLinkThresholdTable          | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkThreshShortPeriod         | Interval for short period,                                                                | nnGLinkThresholdTable          | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkThreshShortRatio          | Threshold to cross for a ShortPeriod performance measure. Ratio Expressed in %            | nnGLinkThresholdTable          | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkThreshLongPeriod          | Interval for long period,                                                                 | nnGLinkThresholdTable          | NORTEL-UEMG-GIGE_mib     |     |
| nnGLinkThreshLongRatio           | Threshold to cross for a LongPeriod performance measure. Ratio Expressed in %             | nnGLinkThresholdTable          | NORTEL-UEMG-GIGE_mib     |     |

|                                      |                                                                                                                                                                                                                                                                                                                                                                     |                       |                      |  |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|--|
| nnGLinkThreshNotify                  | Indicates whether a notification should be generated if the thresholds (either) are breached for this performanceMeasure                                                                                                                                                                                                                                            | nnGLinkThresholdTable | NORTEL-UEMG-GIGE_mib |  |
| <b>Ethernet-Like MIB</b>             |                                                                                                                                                                                                                                                                                                                                                                     |                       |                      |  |
| <b>dot3StatsTable</b>                |                                                                                                                                                                                                                                                                                                                                                                     |                       |                      |  |
| dot3StatsAlignmentErrors             | A count of frames received on a particular interface that are not an integral number of octets in length and do not pass the FCS check.                                                                                                                                                                                                                             | dot3StatsTable        | Ethernet-Like MIB    |  |
| dot3StatsFCSErrors                   | A count of frames received on a particular interface that are an integral number of octets in length but do not pass the FCS check. This count does not include frames received with frame too-long or frame-too-short error.                                                                                                                                       | dot3StatsTable        | Ethernet-Like MIB    |  |
| dot3StatsInternalMac                 | A count of frames for which transmission on a particular interface fails due to an internal MAC sublayer transmit error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsLateCollisions object, the dot3StatsExcessiveCollisions object, or the dot3StatsCarrierSenseErrors object. | dot3StatsTable        | Ethernet-Like MIB    |  |
| dot3StatsCarrierSenseErrors          | The number of times that the carrier sense condition was lost or never asserted when attempting to transmit a frame on a particular interface.                                                                                                                                                                                                                      | dot3StatsTable        | Ethernet-Like MIB    |  |
| dot3StatsFrameTooLongs               | A count of frames received on a particular interface that exceed the maximum permitted frame size.                                                                                                                                                                                                                                                                  | dot3StatsTable        | Ethernet-Like MIB    |  |
| dot3StatsInternalMacReceiveErrors    | A count of frames for which reception on a particular interface fails due to an internal MAC sublayer receive error. A frame is only counted by an instance of this object if it is not counted by the corresponding instance of either the dot3StatsFrameTooLongs object, the dot3StatsAlignmentErrors object, or the dot3StatsFCSErrors object.                   | dot3StatsTable        | Ethernet-Like MIB    |  |
| dot3StatsSymbolErrors                | For an interface operating at 100 Mb/s, the number of times there was an invalid data symbol when a valid carrier was present.                                                                                                                                                                                                                                      | dot3StatsTable        | Ethernet-Like MIB    |  |
| <b>dot3PauseTable</b>                |                                                                                                                                                                                                                                                                                                                                                                     |                       |                      |  |
| dot3InPauseFrames                    | A count of MAC Control frames received on this interface with an opcode indicating the PAUSE operation                                                                                                                                                                                                                                                              |                       |                      |  |
| dot3OutPauseFrames                   | A count of MAC Control frames transmitted on this interface with an opcode indicating the PAUSE operation                                                                                                                                                                                                                                                           |                       |                      |  |
| <b>Remote Network Monitoring MIB</b> |                                                                                                                                                                                                                                                                                                                                                                     |                       |                      |  |
| <b>etherStatsTable</b>               |                                                                                                                                                                                                                                                                                                                                                                     |                       |                      |  |

|                          |                                                                                                                                                                                                                                                                                                                        |                   |                               |  |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------------------|--|
| etherStatsDropEvents     | The total number of events in which packets were dropped by the probe due to lack of resources. Note that this number is not necessarily the number packets dropped; it is just the number of times this condition has been detected.                                                                                  | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsBroadcastPkts  | The total number of good packets received that were directed to the broadcast address. Note that this does not include multicast packets.                                                                                                                                                                              | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsMulticastPkts  | The total number of good packets received that were directed to a multicast address. Note that this number does not include packets directed to the broadcast address.                                                                                                                                                 | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsCRCAlignErrors | The total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsUndersizePkts  | The total number of packets received that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed.                                                                                                                                                             | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsOversizePkts   | The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed.                                                                                                                                                              | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsFragments      | The total number of packets received that were less than 64 octets in length (excluding framing bits but including FCS octets) and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error)                       | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsJabbers        | The total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error)                           | etherStatsTable   | Remote Network Monitoring MIB |  |
| etherStatsCollisions     | The best estimate of the total number of collisions on this Ethernet segment.                                                                                                                                                                                                                                          | etherStatsTable   | Remote Network Monitoring MIB |  |
| <b>etherHistoryTable</b> |                                                                                                                                                                                                                                                                                                                        |                   |                               |  |
| etherHistoryDropEvents   | The total number of events in which packets were dropped by the probe due to lack of resources during this sampling interval. Note that this number is not necessarily the number of packets dropped, it is just the number of times this condition has been detected.                                                 | etherHistoryTable | Remote Network Monitoring MIB |  |

|                                    |                                                                                                                                                                                                                                                                                                                                            |                             |                               |  |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|--|
| etherHistoryBroadcastPkts          | The number of good packets received during this sampling interval that were directed to the broadcast address.                                                                                                                                                                                                                             | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryMulticastPkts          | The number of good packets received during this sampling interval that were directed to a multicast address. Note that this number does not include packets addressed to the broadcast address.                                                                                                                                            | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryCRCAlignErrors         | The number of packets received during this sampling interval that had a length (excluding framing bits but including FCS octets) between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error). | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryUndersizePkts          | The number of packets received during this sampling interval that were less than 64 octets long (excluding framing bits but including FCS octets) and were otherwise well formed.                                                                                                                                                          | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryOversizePkts           | The number of packets received during this sampling interval that were longer than 1518 octets (excluding framing bits but including FCS octets) but were otherwise well formed.                                                                                                                                                           | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryFragments              | The total number of packets received during this sampling interval that were less than 64 octets in length (excluding framing bits but including FCS octets) had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error)                 | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryJabbers                | The number of packets received during this sampling interval that were longer than 1518 octets (excluding framing bits but including FCS octets), and had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a non-integral number of octets (Alignment Error)                        | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryCollisions             | The best estimate of the total number of collisions on this Ethernet segment during this sampling interval.                                                                                                                                                                                                                                | etherHistoryTable           | Remote Network Monitoring MIB |  |
| etherHistoryUtilization            | The best estimate of the mean physical layer network utilization on this interface during this sampling interval, in hundredths of a percent.                                                                                                                                                                                              | etherHistoryTable           | Remote Network Monitoring MIB |  |
| <b>HC-RMON-MIB</b>                 |                                                                                                                                                                                                                                                                                                                                            |                             |                               |  |
| <b>etherStatsHighCapacityTable</b> |                                                                                                                                                                                                                                                                                                                                            |                             |                               |  |
| etherStatsHighCapacityOverflowPkts | The number of times the associated etherStatsPkts counter has overflowed.                                                                                                                                                                                                                                                                  | etherStatsHighCapacityTable | HC-RMON-MIB                   |  |



|                                        |                                                                                                                                                                              |                               |                       |  |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------|--|
| etherStatsHighCapacityPkts             | The total number of packets (including bad packets, broadcast packets, and multicast packets) received.                                                                      | etherStatsHighCapacityTable   | HC-RMON-MIB           |  |
| etherStatsHighCapacityOverflowOctets   | The number of times the associated etherStatsOctets counter has overflowed.                                                                                                  | etherStatsHighCapacityTable   | HC-RMON-MIB           |  |
| etherStatsHighCapacityOctets           | The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets)                                | etherStatsHighCapacityTable   | HC-RMON-MIB           |  |
| <b>etherHistoryHighCapacityTable</b>   |                                                                                                                                                                              |                               |                       |  |
| etherHistoryHighCapacityOverflowPkts   | The number of times the associated etherHistoryPkts Gauge overflowed during this sampling interval.                                                                          | etherHistoryHighCapacityTable | HC-RMON-MIB           |  |
| etherHistoryHighCapacityPkts           | The total number of packets (including bad packets, broadcast packets, and multicast packets) received during this sampling interval.                                        | etherHistoryHighCapacityTable | HC-RMON-MIB           |  |
| etherHistoryHighCapacityOverflowOctets | The number of times the associated etherHistoryOctets counter has overflowed during this sampling interval.                                                                  | etherHistoryHighCapacityTable | HC-RMON-MIB           |  |
| etherHistoryHighCapacityOctets         | The total number of octets of data (including those in bad packets) received on the network (excluding framing bits but including FCS octets) during this sampling interval. | etherHistoryHighCapacityTable | HC-RMON-MIB           |  |
| <b>SMON-MIB</b>                        |                                                                                                                                                                              |                               |                       |  |
| <b>smonVlanIdStatsTable</b>            |                                                                                                                                                                              |                               |                       |  |
| smonVlanIdStatsTotalPkts               | The total number of packets counted on this VLAN.                                                                                                                            | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsTotalHCPkts             | The total number of packets counted on this VLAN.                                                                                                                            | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsTotalOctets             | The total number of octets counted on this VLAN.                                                                                                                             | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsTotalHCOctets           | The total number of octets counted on this VLAN.                                                                                                                             | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsNUcastPkts              | The total number of non-unicast packets counted on this VLAN.                                                                                                                | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsNUcastHCPkts            | The total number of non-unicast packets counted on this VLAN.                                                                                                                | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsNUcastOctets            | The total number of non-unicast octets counted on this VLAN.                                                                                                                 | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsNUcastOverflowOctets    | The number of times the associated smonVlanIdStatsNUcastOctets counter has overflowed.                                                                                       | smonVlanIdStatsTable          | SMON-MIB              |  |
| smonVlanIdStatsNUcastHCOctets          | The total number of Non-unicast octets counted on this VLAN.                                                                                                                 | smonVlanIdStatsTable          | SMON-MIB              |  |
| <b>NORTEL-UEMG-IPSEC-MIB</b>           |                                                                                                                                                                              |                               |                       |  |
| <b>nnlpsecOmCurrentTable</b>           |                                                                                                                                                                              |                               |                       |  |
| nnlpsecOmCurrentPacketsTx              | Number of Transmitted Packets this 15min interval                                                                                                                            | nnlpsecOmCurrentTable         | NORTEL-UEMG-IPSEC-MIB |  |
| nnlpsecOmCurrentPacketsRx              | Number of Received Packets this 15min interval                                                                                                                               | nnlpsecOmCurrentTable         | NORTEL-UEMG-IPSEC-MIB |  |
| nnlpsecOmCurrentPacketsDiscardedOut    | Number of Dropped Outbound Packets this 15min interval                                                                                                                       | nnlpsecOmCurrentTable         | NORTEL-UEMG-IPSEC-MIB |  |
| nnlpsecOmCurrentPacketsDiscardedIn     | Number of Dropped Inbound Packets this 15min interval                                                                                                                        | nnlpsecOmCurrentTable         | NORTEL-UEMG-IPSEC-MIB |  |
| <b>nnlpsecOmIntervalTable</b>          |                                                                                                                                                                              |                               |                       |  |
| nnlpsecOmIntervalPacketsTx             | Number of Transmitted Packets this 15min interval                                                                                                                            | nnlpsecOmIntervalTable        | NORTEL-UEMG-IPSEC-MIB |  |
| nnlpsecOmIntervalPacketsRx             | Number of Received Packets this 15min interval                                                                                                                               | nnlpsecOmIntervalTable        | NORTEL-UEMG-IPSEC-MIB |  |



|                                      |                                                           |                        |                       |  |
|--------------------------------------|-----------------------------------------------------------|------------------------|-----------------------|--|
| nnIpsecOmIntervalPacketsDiscardedOut | Number of Dropped Outbound<br>Packets this 15min interval | nnIpsecOmIntervalTable | NORTEL-UEMG-IPSEC-MIB |  |
| nnIpsecOmIntervalPacketsDiscardedIn  | Number of Dropped Inbound Packets<br>this 15min interval  | nnIpsecOmIntervalTable | NORTEL-UEMG-IPSEC-MIB |  |

# Appendix C: VOA/IP MSS15000, MG15000, and MDM Alarm Log Summary

## 1. Introduction

This document provides a list of Multiservice Switch 15000 (MSS15000), Media Gateway 15000 (MG15000) (formerly known as PVG) and Multiservice Data Manager (MDM) alarm logs applicable to up to SN08 for Voice over ATM (VOA) and Voice over IP (VOIP) solutions.

The purpose of this document includes:

- It provides a VOA/VOIP customer (and more specifically an OSS Fault application writer) a summarized subset of the possible alarms that can appear when MSS15000 and MDM are configured for the VOA/VOIP application. The descriptions of the alarms are found in [6] and [3].
- When configured to receive MSS15000/MDM Alarm logs in SCC2 format from the Supernode Data Manager (SDM), it also provides the mapping information needed to interpret the SCC2 format.
- It is also input to solution-level OSS Guide information which is in progress of being delivered to provide this information in the FCAPS-based solution documentation.

## 2. SCC2 Log Format

The SCC2 log report for MSS15000 and MDM alarms comprises a one line header, followed by seven lines of body text, as per the following example:

```
37 PPEM300 8169 TBL
time: 2002 01 11 15 37 06
event: clear
compld: EM P15KF LP 7 SONET 3
severity: cleared
faultCode: 70115201
alarmType: communications
commentData: Loss of frame condition has been cleared.
```

The header is of format:

```
aabbccdddeeeffgghhijjj
```

Each field, as applicable for MSS15000 and MDM alarms, is described in Table 1.

**Table 1 MSS15000 and MDM SCC2 Header Field Description**

| Field | Description                                       | Applicable Log Values                                                                                                                                                        |
|-------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| aa    | Alarm severity<br>MSS15000/MDM alarm log severity | "*C" = critical alarm<br>"***" = major alarm<br>"* " = minor and warning and indeterminate alarm<br>" " = clear alarm<br>Two characters, left justified, padded with blanks. |

| Field                                 | Description                                                                                                                                                                       | Applicable Log Values                                                                                                                                                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| bb                                    | Minute indicator<br>Two numeric character indicator representing the minutes after the hour. Generated by SDM at time SDM receives the alarm log from MDM.                        | Ranges from 00 to 59, right justified, padded with zeros.                                                                                                                                                                                                 |
| c                                     | single space                                                                                                                                                                      | " "                                                                                                                                                                                                                                                       |
| dddd                                  | Log Name<br>Assigned by SDM. Based upon the first four digits ("Index Group") of the eight-digit MSS15000 or MDM alarm identifier.                                                | Four characters, left justified, padded with blanks.<br>"CA " for index group 0000.<br>"PPEM" for index groups beginning with 70xx and some fault codes in group 0999.<br>"MDM " for index groups beginning with 30xx and some fault codes in group 0999. |
| eee                                   | Log Number<br>Three numeric characters representing the MSS15000 or MDM Alarm Type. Note that the Alarm Type "debug" is not translated as a fault, but rather as information log. | "300" = communications<br>"301" = quality of service<br>"302" = processing<br>"303" = equipment<br>"304" = environmental<br>"305" = security<br>"306" = operator<br>"307" = unknown                                                                       |
| f                                     | A single space for all MSS15000 and MDM alarm logs.                                                                                                                               | " "                                                                                                                                                                                                                                                       |
| gg                                    | Global Sequence Number<br>Generated by SDM. Two numeric characters, incremented by SDM upon receipt of every alarm log.                                                           | Ranges from 00 to 99, right justified, padded with zeros.                                                                                                                                                                                                 |
| hh                                    | Device Sequence Number<br>Generated by SDM. Two numeric characters, incremented by SDM upon receipt of every device specific alarm log from MDM (originated by MSS15000 or MDM).  | Ranges from 00 to 99, right justified, padded with zeros.                                                                                                                                                                                                 |
| i                                     | single space                                                                                                                                                                      | " "                                                                                                                                                                                                                                                       |
| jjjj                                  | Event Type<br>Assigned by SDM. String assigned for all MSS15000 and MDM alarm logs.                                                                                               | "TBL "<br>Four characters, left justified, padded with blanks.                                                                                                                                                                                            |
| Lines<br>2, 3,<br>4, 5,<br>6, 7,<br>8 | Body Text<br>Seven textual lines, each of form<br><AlarmFieldName>: <AlarmFieldValue>                                                                                             | "time: "<br>"event: "<br>"compld: "<br>"severity: "<br>"faultCode: "<br>"alarmType: "<br>"commentData: "<br>Comment data is truncated so that entire log does not exceed 900 bytes.                                                                       |

### 3. MSS15000 Alarm Logs

Table 2 presents the list of MSS15000 set/clear alarm logs that are applicable for Succession VOA/VOIP.

Table 2 does not explicitly state all MSS15000 clear alarm logs that correspond to each set. The SCC2 header for the clear differs from its corresponding set by only the first two characters. The characters “aa” are replaced by “ ” (two spaces). This format is presented in Table 1.

The MSS15000 alarm identifier consists of an eight-digit number identifying the alarm. The first four digits comprise the **Index Group**, which represents logical groupings of alarms. The last four digits are the **SubIndex**, which is an identifier within each index group.

**Component Name** indicates the managed object against which the alarm Log is generated. This table contains the CLI format of a component name. The “compld” field in SCC2 format contains this information (with the module’s <nodename> pre-pended). Also, “compld” follows the MDM API-style format (with component type and instance separated by a space instead of a slash, and ‘\$’ appearing in place of a null instance value). Variables (usually instance value ranges) are denoted by <> and the reader should reference the Alarms NTP’s [3] and [6] for further information.

**Table 2 MSS15000 Set/Clear Alarms Supported for Succession**

| MSS15000 Index Group | Component Name                                                                                                                          | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                                                 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|-----------------------------------------------------------------------------|
| 0000                 | OSI administrative state changes, general engineering and memory alarms, internal software error detected, etc.                         |                                       |                   |                           |                                                                             |
|                      | This alarm can apply to many MSS15000 components.                                                                                       |                                       | 0000              |                           | bb CA eee gghh<br>TBL<br>where:<br>eee = 302, 303, 306                      |
|                      | This alarm can apply to many MSS15000 components.                                                                                       |                                       | 1000              |                           | aabb CA eee gghh<br>TBL<br>where:<br>aa = “*C”, “*”, “* ”<br>eee = 300, 306 |
|                      | This alarm can apply to many MSS15000 components.                                                                                       |                                       | 1001              |                           | aabb CA 303 gghh<br>TBL<br>where:<br>aa = “*C”, “*”, “* ”                   |
|                      | This alarm can apply to many MSS15000 components.                                                                                       |                                       | 3000              |                           | aabb CA eee gghh<br>TBL<br>where:<br>aa = “*C”, “*”, “* ”<br>eee = 300, 302 |
|                      | This alarm can apply to many MSS15000 components.                                                                                       |                                       | 3001<br>3002      |                           | aabb CA 302 gghh<br>TBL<br>where:<br>aa = “*C”, “*”, “* ”                   |
| 7000                 | Provisioning alarms. These alarms apply to failures resulting from provisioning attempts. e.g., loading a provisioning file has failed. |                                       |                   |                           |                                                                             |
|                      | Prov                                                                                                                                    |                                       | 0007              |                           | aabb PPEM306 gghh<br>TBL<br>where:<br>aa = “*C”, “*”, “* ”                  |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                   | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                       |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|---------------------------------------------------|
|                      | This alarm can apply to many MSS15000 components.                                                                                                                                                                                                                |                                       | 0010              |                           | * bb PPEM302 gghh TBL                             |
|                      | Prov Migration                                                                                                                                                                                                                                                   |                                       | 0033              |                           | aabb PPEM306 gghh TBL<br>where:<br>aa = “*C”, “*” |
|                      | Prov                                                                                                                                                                                                                                                             |                                       | 0036              |                           | aabb PPEM301 gghh TBL<br>where:<br>aa = “*”, “*”  |
|                      | Prov                                                                                                                                                                                                                                                             |                                       | 0037              |                           | *Cbb PPEM301 gghh TBL                             |
|                      | Prov                                                                                                                                                                                                                                                             |                                       | 0038              |                           | * bb PPEM301 gghh TBL                             |
|                      | Prov                                                                                                                                                                                                                                                             |                                       | 0040              |                           | **bb PPEM302 gghh TBL                             |
|                      | Provisioning Patch                                                                                                                                                                                                                                               |                                       | 0041              |                           | * bb PPEM306 gghh TBL or<br>*Cbb PPEM306 gghh TBL |
| 7002                 | Backplane control system alarms; e.g., communication failure between a card and the backplane. Note:<br>FabricCard instance range (<i>): X, Y<br>Card instance range (<n>): 0-15                                                                                 |                                       |                   |                           |                                                   |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0002              |                           | **bb PPEM303 gghh TBL                             |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0003              |                           | *Cbb PPEM304 gghh TBL                             |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0004              |                           | *Cbb PPEM304 gghh TBL                             |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0005              |                           | **bb PPEM302 gghh TBL                             |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0006              |                           | **bb PPEM302 gghh TBL                             |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0007              |                           | **bb PPEM302 gghh TBL                             |
|                      | Shelf Card/<n>                                                                                                                                                                                                                                                   |                                       | 0008              |                           | * bb PPEM303 gghh TBL                             |
|                      | Shelf FabricCard/<i>                                                                                                                                                                                                                                             |                                       | 0009              |                           | * bb PPEM303 gghh TBL                             |
| 7003                 | Data collection system alarms; e.g., an alarm or log queue size has exceeded a threshold.<br>Collector instance range (<t>): accounting, alarm, log, debug, scn, trap, stats, rtStats, appl<br>Agent instance range (<n>): 0-15<br>LP instance range (<n>): 0-15 |                                       |                   |                           |                                                   |
|                      | Collector/<t> Agent/<n>                                                                                                                                                                                                                                          |                                       | 0001              |                           | **bb PPEM301 gghh TBL                             |
|                      | Collector/<t> Spooler                                                                                                                                                                                                                                            |                                       | 0002              |                           | **bb PPEM302 gghh TBL                             |
|                      | Collector/<t> Spooler                                                                                                                                                                                                                                            |                                       | 0003              |                           | * bb PPEM301 gghh TBL                             |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header           |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|-----------------------|
|                      | LP/<n> Eng AAList                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       | 0007              |                           | **bb PPEM301 gghh TBL |
| 7006                 | Radius security alarms.<br>Ac Radius                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                       | 0100              |                           | *Cbb PPEM305 gghh TBL |
| 7008                 | File system alarms.<br>Disk instance range (<n>): 0-1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                       |                   |                           |                       |
|                      | FileSystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | 1001              |                           | **bb PPEM302 gghh TBL |
|                      | FileSystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | 1002              |                           | *Cbb PPEM302 gghh TBL |
|                      | FileSystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | 1004              |                           | *Cbb PPEM303 gghh TBL |
|                      | FileSystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | 1005              |                           | * bb PPEM303 gghh TBL |
|                      | FileSystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | 1006              |                           | **bb PPEM302 gghh TBL |
|                      | FileSystem Disk/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                       | 1008              |                           | **bb PPEM303 gghh TBL |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1009              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1010              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1011              |                           |                       |
|                      | FileSystem                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                       | 1019              |                           | * bb PPEM303 gghh TBL |
| 7011                 | Port management system and Automatic Protection Switching alarms.<br>LP instance range (<n>): 0-15<br>Port types (<type>): Sonet, EDS1, DS3, BridgedSonet(Bso), Ethernet, Sdh<br>Sonet instance range (<n2>): 0-15 (16-port); 0-3 (4-port)<br>EDS1 instance range (<n2>): 0-1<br>IMA instance range (<n3>): 0-13<br>LK instance range (<n4>): 0-31<br>DS3 instance range (<n2>): 0-3 (4-port); 0-11 (12-port)<br>DS1 instance range (<n3>): 1-28<br>Ethernet instance range (<n2>): 0-3<br>LAPS instance range (<n>): 0-15999<br>Chan instance range (<n4>): 0-23<br>Bso instance range (<n2>): 0-15<br>Pbg instance range (<n>): 0-15999<br>Sdh instance range (<n2>): 0-n, where n is 1 less than the number of ports<br>Sts instance range (<n2>): 0-11<br>Lag instance range (<y>): 0-7<br>Lag link instance range (<z>): 0-31 |                                       |                   |                           |                       |
|                      | LP/<n> DS3/<n2> IMA <n3>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       | 1100              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> DS3/<n2> IMA/<n3>...<br>...LK/<n4>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       | 1200              |                           | *Cbb PPEM300 gghh TBL |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1210              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1211              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1212              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1213              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1214              |                           |                       |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                       | 1215              |                           |                       |

| MSS15000 Index Group | Component Name                                                                                                                                | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header           |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|-----------------------|
|                      |                                                                                                                                               |                                       | 1216              |                           |                       |
|                      | LP/<n> Lag/<y>                                                                                                                                |                                       | 1500              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> Lag/<y> Link/<z>                                                                                                                       |                                       | 1501              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> <type>/<n2>                                                                                                                            |                                       | 2000              |                           | *Cbb PPEM303 gghh TBL |
|                      | LP/0 EDS1/<n2><br>LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sdh/0 Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1 |                                       | 5000              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/0 EDS1/<n2><br>LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sdh/0 Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1 |                                       | 5001              |                           | * bb PPEM300 gghh TBL |
|                      | LP/0 EDS1/<n2><br>Lp/<n> Sdh/0 Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1                             |                                       | 5002              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sdh/<n2> Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1                |                                       | 5003              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sdh/<n2> Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1                |                                       | 5004              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sdh/<n2> Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1                |                                       | 5005              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sdh/<n2> Vc4/0 Vc12/{1-3,1-7,1-3} E1<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1                |                                       | 5006              |                           | **bb PPEM300 gghh TBL |
|                      | LP/<n> DS3/<n2> DS1/<n3><br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4} DS1<br>Lp/<n> Sdh/0 Vc4/0 Vc12/{1-3,1-7,1-3} E1                   |                                       | 5010              |                           | * bb PPEM300 gghh TBL |

| MSS15000 Index Group | Component Name                                                                                              | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                        |
|----------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|----------------------------------------------------|
|                      | LP/<n> DS3/<n2> DS1/<n3>                                                                                    |                                       | 5011              |                           | * bb PPEM300 gghh TBL                              |
|                      | LP/0 EDS1/<n2>                                                                                              |                                       | 5050              |                           | aabb PPEM303 gghh TBL<br>where:<br>aa = “*C”, “* “ |
|                      | LP/<n> DS3/<n2>                                                                                             |                                       | 5100              |                           | *Cbb PPEM300 gghh TBL                              |
|                      | LP/<n> DS3/<n2>                                                                                             |                                       | 5101              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                             |                                       | 5102              |                           |                                                    |
|                      |                                                                                                             |                                       | 5103              |                           |                                                    |
|                      |                                                                                                             |                                       | 5104              |                           |                                                    |
|                      | LP/<n> DS3/<n2>                                                                                             |                                       | 5105              |                           | * bb PPEM300 gghh TBL                              |
|                      | LP/<n> DS3/<n2>                                                                                             |                                       | 5110              |                           | *Cbb PPEM300 gghh TBL                              |
|                      | LP/<n> DS3/<n2>                                                                                             |                                       | 5111              |                           | * bb PPEM300 gghh TBL                              |
|                      |                                                                                                             |                                       | 5120              |                           |                                                    |
|                      |                                                                                                             |                                       | 5121              |                           |                                                    |
|                      |                                                                                                             |                                       | 5122              |                           |                                                    |
|                      | LP/<n> Sonet/<n2><br>LP/<n> Sdh/<n2>                                                                        |                                       | 5200              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                             |                                       | 5201              |                           |                                                    |
|                      |                                                                                                             |                                       | 5202              |                           |                                                    |
|                      | LP/<n> Sonet/<n2><br>LP/<n> Sdh/<n2>                                                                        |                                       | 5203              |                           | * bb PPEM300 gghh TBL                              |
|                      |                                                                                                             |                                       | 5204              |                           |                                                    |
|                      |                                                                                                             |                                       | 5210              |                           |                                                    |
|                      |                                                                                                             |                                       | 5211              |                           |                                                    |
|                      | LP/<n> Sonet/<n2> Sts/<n2><br>Lp/<n> Sdh/<n2> Vc4/0<br>LAPS/<n> Sts/<n2><br>LAPS/<n> Vc4/0<br>Pbg/<n> Sts/0 |                                       | 5250              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                             |                                       | 5251              |                           |                                                    |
|                      | LP/<n> Sonet/<n2> Sts/<n2><br>Lp/<n> sdh/<n2> Vc4/0<br>LAPS/<n> Sts/<n2><br>LAPS/<n> Vc4/0<br>Pbg/<n> Sts/0 |                                       | 5252              |                           | * bb PPEM300 gghh TBL                              |
|                      | LP/<n> Sonet/<n2> Sts/<n2><br>Lp/<n> Sdh/<n2> Vc4/0<br>LAPS/<n> Sts/<n2><br>LAPS/<n> Vc4/0<br>Pbg/<n> Sts/0 |                                       | 5253              |                           | *Cbb PPEM300 gghh TBL                              |



| MSS15000 Index Group | Component Name                                                                                                                                                                                                                              | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header           |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|-----------------------|
|                      | LP/<n> Sonet/<n2> Sts/0<br>Lp/<n> Sdh/<n2> Vc4/0<br>LAPS/<n> Sts/0<br>LAPS/<n> Vc4/0<br>Pbg/<n> Sts/0                                                                                                                                       |                                       | 5254              |                           | *Cbb PPEM300 gghh TBL |
|                      | Lp/<n> Sonet/<n2> Path/<n2><br>Lp/<n> Sonet/<n2> Sts/<n2><br>Lp/<n> Sonet/<n2> Vc4/<n2><br>Lp/<n> Sdh/<n2> Path/0<br>Lp/<n> Sdh/<n2> Sts/0<br>Lp/<n> Sdh/<n2> Vc4/0<br>LAPS/<n> Path/0<br>LAPS/<n> Sts/0<br>LAPS/<n> Vc4/0<br>Pbg/<n> Sts/0 |                                       | 5255              |                           | *Cbb PPEM300 gghh TBL |
|                      | Lp/<n> Sonet/<n2> Sts/<n2><br>Lp/<n> Sdh/<n2> Vc4/0<br>Lp/<num1> Sdh/<n2> Vc4/0<br>Vc12/{1-3, 1-7, 1-3}<br>Laps/<n> Sts/<num3><br>Laps/<n> Sdh/<num2> Vc4/0<br>Laps/<n> Sdh/<n2> Vc4/0<br>Vc12/{1-3, 1-7, 1-3}<br>Pbg/<n> Sts/{0-11}        |                                       | 5256              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> Sonet/<n2> Sts/<n2><br>LP/<n> Sdh/<n2> Vc4/0<br>LAPS/<n> Sts/<n2><br>LAPS/<n> Vc4/0<br>Pbg/<n> Sts/0                                                                                                                                 |                                       | 5260              |                           | * bb PPEM300 gghh TBL |
|                      |                                                                                                                                                                                                                                             |                                       | 5261              |                           |                       |
|                      | LAPS/<n>                                                                                                                                                                                                                                    |                                       | 5270              |                           | **bb PPEM300 gghh TBL |
|                      | LAPS/<n>                                                                                                                                                                                                                                    |                                       | 5271              |                           | * bb PPEM300 gghh TBL |
|                      | LAPS/<n>                                                                                                                                                                                                                                    |                                       | 5272              |                           | * bb PPEM300 gghh TBL |
|                      | LAPS/<n>                                                                                                                                                                                                                                    |                                       | 5273              |                           | * bb PPEM300 gghh TBL |
|                      | LAPS/n                                                                                                                                                                                                                                      |                                       | 5274              |                           | * bb PPEM300 gghh TBL |
|                      | LAPS/<n>                                                                                                                                                                                                                                    |                                       | 5275              |                           | *Cbb PPEM300 gghh TBL |
|                      | LP/<n> Sdh/<n2> Vc4/0<br>Vc12/{1-3,1-7,1-3}<br>Lp/<n> Sonet/<n2> Sts/<n2><br>Vt1dot5/{1-7,1-4}<br>LAPS/<n> Vc4/0 Vc12/{1-3,1-7,1-3}<br>LAPS/<n> Sts/<n2> Vt1dot5/{1-7,1-4}                                                                  |                                       | 5290              |                           | * bb PPEM303 gghh TBL |
|                      |                                                                                                                                                                                                                                             |                                       | 5291              |                           |                       |
|                      |                                                                                                                                                                                                                                             |                                       | 5292              |                           |                       |
|                      |                                                                                                                                                                                                                                             |                                       | 5293              |                           |                       |
|                      |                                                                                                                                                                                                                                             |                                       | 5294              |                           |                       |

| MSS15000 Index Group | Component Name                                                                                                                                                          | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|----------------------------------------------------|
|                      | LP/<n> Sdh/<n2> Vc4/0 Vc12/{1-3,1-7,1-3}<br>Lp/<n> Sonet/<n2> Sts/<n2> Vt1dot5/{1-7,1-4}<br>LAPS/<n> Vc4/0 Vc12/{1-3,1-7,1-3}<br>LAPS/<n> Sts/<n2> Vt1dot5/{1-7,1-4}    |                                       | 5295<br>5296      |                           | *Cbb PPEM303 gghh TBL                              |
|                      | LP/<n> Sdh/<n2> Vc4/0 Vc12/{1-3,1-7,1-3}<br>Lp/<n> Sonet/<n2> Sts/<n2> Vt1dot5/{1-7,1-4}<br>LAPS/<n> Vc4/0 Vc12/{1-3,1-7,1-3}<br>LAPS/<n> Sts/<n2> Vt1dot5/{1-7,1-4}    |                                       | 5297              |                           | *Cbb PPEM303/6 gghh TBL                            |
|                      | LP/<n> Ethernet/<n2><br>LP/<n> Ethernet/<n2><br>LP/<n> Ethernet/<n2><br>LP/<n> Ethernet/<n2><br>LP/<n> Ethernet/<n2><br>OpticalModule                                   |                                       | 5400              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                                                                                         |                                       | 5401              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                                                                                         |                                       | 5402              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                                                                                         |                                       | 5403              |                           | *Cbb PPEM300 gghh TBL                              |
|                      |                                                                                                                                                                         |                                       | 5480              |                           | **bb PPEM300 gghh TBL                              |
|                      | LP/<n> Sonet/<n2><br>LP/<n> Sonet/<n2> Sts/0<br>LAPS/<n> Sts/0<br>LP/<n> DS3/<n2><br>LP/<n> DS3/<n2> DS1/<n3><br>LP/<n> DS3/<n2> DS1/<n3><br>Chan/<n4><br>Pbg/<n> Sts/0 |                                       | 5501              |                           | **bb PPEM300 gghh TBL                              |
|                      | LP/<n> DS3/<n2>                                                                                                                                                         |                                       | 5601<br>5602      |                           | * bb PPEM300 gghh TBL                              |
|                      | LP/<n> DS3/<n2>                                                                                                                                                         |                                       | 5603<br>5604      |                           | **bb PPEM300 gghh TBL                              |
| 7012                 | Processor control system alarms.<br>LP instance range (<n>): 0-15<br>Card instance range (<n>): 0-15<br>FabricCard instance range (<i>): X, Y                           |                                       |                   |                           |                                                    |
|                      | Shelf                                                                                                                                                                   |                                       | 0050              |                           | **bb PPEM303 gghh TBL                              |
|                      | Shelf                                                                                                                                                                   |                                       | 0051              |                           | aabb PPEM303 gghh TBL<br>where:<br>aa = “*C”, “**” |
|                      | Shelf<br>Shelf FabricCard/<i>                                                                                                                                           |                                       | 0052              |                           | **bb PPEM303 gghh TBL                              |

| MSS15000 Index Group | Component Name                                                                         | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                        |
|----------------------|----------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|----------------------------------------------------|
|                      | Shelf                                                                                  |                                       | 0053              |                           | **bb PPEM303 gghh TBL                              |
|                      | Shelf                                                                                  |                                       | 0055              |                           | aabb PPEM303 gghh TBL<br>where:<br>aa = “**” , “*” |
|                      | Shelf                                                                                  |                                       | 0056              |                           | * bb PPEM303 gghh TBL                              |
|                      | Shelf                                                                                  |                                       | 0057              |                           | **bb PPEM303 gghh TBL                              |
|                      | Shelf                                                                                  |                                       | 0058              |                           | TBL                                                |
|                      | Shelf                                                                                  |                                       | 0059              |                           | *Cbb PPEM304 gghh TBL                              |
|                      | Shelf Card/<n>                                                                         |                                       | 0100              |                           | aabb PPEM303 gghh TBL<br>where:<br>aa = “*C” , “*” |
|                      | Shelf Card/<n>                                                                         |                                       | 0103              |                           | **bb PPEM303 gghh TBL                              |
|                      | Shelf Card/<n>                                                                         |                                       | 0104              |                           | TBL                                                |
|                      | Shelf Card/<n>                                                                         |                                       | 0105              |                           | * bb PPEM306 gghh TBL                              |
|                      | LP/<n>                                                                                 |                                       | 0200              |                           | *Cbb PPEM302 gghh TBL                              |
|                      | LP/<n>                                                                                 |                                       | 0202              |                           | * bb PPEM306 gghh TBL                              |
|                      | Shelf Card/<n> SpServ                                                                  |                                       | 0301              |                           | * bb PPEM302 gghh TBL                              |
| 7013                 | Message block usage alarms.<br>LP instance range (<n>): 0-15                           |                                       |                   |                           |                                                    |
|                      | LP/<n>                                                                                 |                                       | 0000              |                           | * bb PPEM301 gghh TBL                              |
|                      | LP/<n>                                                                                 |                                       | 0001              |                           | **bb PPEM301 gghh TBL                              |
|                      | LP/<n>                                                                                 |                                       | 0002              |                           | * bb PPEM301 gghh TBL                              |
|                      |                                                                                        |                                       | 0003              |                           |                                                    |
|                      |                                                                                        |                                       | 0004              |                           |                                                    |
|                      |                                                                                        |                                       | 0005              |                           |                                                    |
|                      | LP/<n>                                                                                 |                                       | 0011              |                           |                                                    |
|                      | LP/<n>                                                                                 |                                       | 0021              |                           | **bb PPEM301 gghh TBL                              |
|                      | LP/<n>                                                                                 |                                       | 0022              |                           | * bb PPEM301 gghh TBL                              |
| 7014                 | Memory management alarms                                                               |                                       |                   |                           |                                                    |
|                      | LP/<n>                                                                                 |                                       | 0000              |                           | * bb PPEM301 gghh TBL                              |
|                      | LP/<n>                                                                                 |                                       | 0001              |                           | **bb PPEM301 gghh TBL                              |
| 7015                 | Network time-of-day (TOD) synchronization alarms.<br>Server instance range (<n>): 1-10 |                                       |                   |                           |                                                    |
|                      | Time                                                                                   |                                       | 0000              |                           | **bb PPEM304 gghh                                  |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                          |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|------------------------------------------------------|
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       | 0002              |                           | TBL                                                  |
|                      | Time Server/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       | 0010              |                           | * bb PPEM300 gghh                                    |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       | 0011              |                           | TBL                                                  |
|                      | Time Server/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       | 0012              |                           | * bb PPEM300 gghh<br>TBL                             |
| 7017                 | Network clock synchronization alarms                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                       |                   |                           |                                                      |
|                      | NS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       | 1000              |                           | * bb PPEM300 gghh<br>TBL                             |
| 7021                 | <p>Internet protocol alarms. For Succession VOA, the IP stack is used only for network management connectivity purposes. For VOIP VR is used to connect to IP network. More than 1 VR may be provisioned in this configuration.</p> <p>VR instance range (&lt;i&gt;): any string, but often specified simply as a digit (e.g., "0")</p> <p>Cache instance range (&lt;n&gt;): 0-15</p> <p>Name of the vrf (&lt;y&gt;)</p> <p>LP number (&lt;lpnum&gt;): 0-15</p> <p>IP address (&lt;ipaddress&gt;): address of the local IpLogicalInterface</p> <p>Protocol Port Id (&lt;ppld&gt;)</p> <p>VirtualIfEntry identifier (&lt;virtIfId&gt;)</p> |                                       |                   |                           |                                                      |
|                      | Vr/<i> Ip Cache/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       | 0006              |                           | **bb PPEM302 gghh<br>TBL                             |
|                      | Vr/<i> Ip Cpp<br>IsolatedDa/<ipaddress>,<lpnum>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       | 0013              |                           | * bb PPEM305 gghh<br>TBL                             |
|                      | Rtr/<i> Cpp<br>IsolatedDa/<ipaddress>,<lpnum>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                       | 0014              |                           | **bb PPEM305 gghh<br>TBL                             |
|                      | Rtr/<i> Vrf/<y> Cpp<br>IsolatedDa/<ipaddress>,<lpnum>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       |                   |                           |                                                      |
|                      | Vr/<i> Pp/<ppld> IpPort<br>logicalIf/<ipaddress><br>OspfIf<br>Rtr/<i> Interface/<ipaddress><br>OspfIf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       | 1002              |                           | **bb PPEM305 gghh<br>TBL                             |
|                      | Vr/<i> Ip Ospf<br>VirtIfEntry/<virtIfId>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                       | 1003              |                           | **bb PPEM305 gghh<br>TBL                             |
|                      | VR/<i> Ip OSPF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       | 1017              |                           | * bb PPEM305 gghh<br>TBL                             |
| 7026                 | LAN port management system alarms. For Succession VOA, the LAN port management system is used only for network management connectivity purposes Same alarms are used for VOIP.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |                   |                           |                                                      |
|                      | LP/0 OamEnet/0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       | 3000              |                           | *Cbb PPEMeee gghh<br>TBL<br>where:<br>eee = 300, 303 |

| MSS15000 Index Group | Component Name                                                                                                                           | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header                                       |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|---------------------------------------------------|
|                      | LP/0 OamEnet/0                                                                                                                           |                                       | 3005              |                           | * bb PPEMeee gghh TBL<br>where:<br>eee = 300, 303 |
| 7039                 | ATM Core alarms.<br>AtmIf instance range (<n>): 1-4095<br>Vcc instance range (<n2.n3>): n2 is VPI; n3 is VCI                             |                                       |                   |                           |                                                   |
|                      | Atmif/<n>                                                                                                                                |                                       | 1000              |                           | * bb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Vcc/<n2.n3>                                                                                                                    |                                       | 2000              |                           | * bb PPEM302 gghh TBL                             |
|                      |                                                                                                                                          |                                       | 2003              |                           |                                                   |
|                      | Atmif/<n> Vpt/<n2>                                                                                                                       |                                       | 3000              |                           | * bb PPEM300 gghh TBL                             |
|                      | Atmif/<n>                                                                                                                                |                                       | 4001              |                           | **bb PPEM300 gghh TBL                             |
| 7041                 | Atmif/<n>                                                                                                                                |                                       | 5000              |                           | *Cbb PPEM300 gghh TBL                             |
|                      | ATM Networking alarms.<br>AtmIf instance range (<n>): 1-4095<br>Vpt instance range (<n2>): 0-4095<br>CfgNode instance range (<n>): 0-104 |                                       |                   |                           |                                                   |
|                      | Atmif/<n> Uni Ilmi                                                                                                                       |                                       | 0050              |                           | **bb PPEMeee gghh TBL<br>where:<br>eee = 300, 303 |
|                      | AtmIf/<n> Uni Ilmi                                                                                                                       |                                       | 0052              |                           | *Cbb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Uni Sig<br>Atmif/<n> Pnni Sig                                                                                                  |                                       | 0150              |                           | **bb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Uni Sig<br>Atmif/<n> Pnni Sig<br>Atmif/<n> Uni Ilmi<br>Atmif/<n> Pnni Rcc                                                      |                                       | 0200              |                           | **bb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Pnni Rcc                                                                                                                       |                                       | 0250              |                           | **bb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Pnni Rcc                                                                                                                       |                                       | 0253              |                           | **bb PPEM300 gghh TBL                             |
|                      | Artg Pnni                                                                                                                                |                                       | 0301              |                           | **bb PPEM300 gghh TBL                             |
|                      | Artg Pnni CfgNode<n> Rcc                                                                                                                 |                                       | 0302              |                           | **bb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Uni<br>Atmif/<n> Pnni                                                                                                          |                                       | 0400              |                           | * bb PPEM300 gghh TBL                             |
|                      | Atmif/<n>                                                                                                                                |                                       | 0401              |                           | **bb PPEM30? gghh TBL                             |
|                      | Atmif/<n> Uni<br>Atmif/<n> Pnni                                                                                                          |                                       | 0500              |                           | * bb PPEM300 gghh TBL                             |
|                      | Atmif/<n> Uni<br>Atmif/<n> Pnni                                                                                                          |                                       | 0600              |                           | * bb PPEM302 gghh TBL                             |
|                      |                                                                                                                                          |                                       | 0601              |                           |                                                   |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | MSS15000/MG15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header            |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-------------------|---------------------------|------------------------|
|                      | Artg Pnni CfgNode /<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      | 0700              |                           | **bb PPEM300 gghh TBL  |
|                      | Atmif/<n> Pnni Rcc                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                      | 0701              |                           | **bb PPEM300 gghh TBL  |
|                      | Artg Pnni CfgNode /<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      | 0703              |                           | * bb PPEM300 gghh TBL  |
| 7042                 | Circuit Emulation Service (CES) alarms.<br>Aal1Ces instance range (<n>) : 1-16383                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |                   |                           |                        |
|                      | Aal1Ces/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                      | 0001              |                           | **bb PPEM301 gghh TBL  |
|                      | Aal1Ces/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                      | 0002              |                           | **bb PPEM302 gghh TBL  |
|                      | Aal1Ces/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                      | 0003              |                           | **bb PPEM300 gghh TBL  |
| 7054                 | Sparing panel subsystem alarms.<br>Card instance range (<n>): 0-15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                      |                   |                           |                        |
|                      | Shelf Card/<n>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                      | 0100              |                           | **bb PPEM303 gghh TBL  |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      | 0101              |                           |                        |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      | 0102              |                           |                        |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      | 0103              |                           |                        |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      | 0104              |                           |                        |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      | 0105              |                           |                        |
| 7056                 | Voice Services Processor (VSP) / Narrowband Service Trunk over ATM (Nsta)<br>This group is specific to MG15000 application (e.g. severe failure of the VSP card)<br>Lp instance range (<x>): 0-15<br>PModule instance range (<y>): 1-24<br>PBlock instance range (<z>): 1-2<br>NSTA instance range (<i>): 0-15999<br>GigE instance range (<m>): 0-1<br>Control instance range (<n>): mg or sg<br>Conn instance range (<l>): 0-128<br>Brag instance range (<d>): 0-159999<br>Q921 instance range (<r>): 1-31<br>LapV5 instance value (<w>): 15, 16, 31<br>Tag instance range (<u>): 0-16777215<br>AtmTConn instance range (<h>): 1-2700 (max 4094)<br>dBrag instance range (<t>): 0-127<br>BragS instance range (<k>): 0-15<br>CasDefn instance range (<z>): 0-24<br>Security policy database name (<spd_name>): string |                                      |                   |                           |                        |
|                      | Lp/<x> Vsp PModule/<y>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      | 0002              |                           | ** bb PPEM306 gghh TBL |
|                      | Lp/<x> Vsp PModule/<y><br>PBlock/<z>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      | 0003              |                           | *Cbb PPEM303 gghh TBL  |
|                      | Lp/<x> Vsp GigE/<m>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      | 0500              |                           | ** bb PPEM300 gghh TBL |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      | 0501              |                           |                        |
| 0502                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                      |                   |                           |                        |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                           | MSS15000/MG 15000 configuration (N/A) | MSS15000 Subindex | Importance Category (N/A) | SCC2 Header            |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------|---------------------------|------------------------|
|                      | Nsta/<i> Conn/<l><br>Nsta/<i> Vgs AtmTConn/<h>                                                                                                                                                                                                                           |                                       | 1000              |                           | **bb PEM300 gghh TBL   |
|                      | Nsta/<l> Vgs                                                                                                                                                                                                                                                             |                                       | 1200              |                           | * bb PPEM300 gghh TBL  |
|                      | Nsta/<i> Vgs IpMConn                                                                                                                                                                                                                                                     |                                       | 1201              |                           | ** bb PPEM300 gghh TBL |
|                      | Nsta/<i> Vgs Control/<n><br>Mediagateway                                                                                                                                                                                                                                 |                                       | 1202              |                           | ** bb PPEM300 gghh TBL |
|                      | Nsta/<i> Vgs Control/<n><br>Signalingateway                                                                                                                                                                                                                              |                                       |                   |                           |                        |
|                      | Nsta/<i> Vgs Control/<n><br>MediaGataway Aap<br>Nsta/<i> Vgs Control/<n><br>Signalinggateway Aap<br>Nsta/<i>Vgs Control/<n><br>SpvcAp<br>Nsta/<i> Vgs IpMConn Aap<br>Nsta/<i> Vgs IpMConn SpvcAp<br>Nsta/<i> Vgs AtmTConn/<h><br>Aap<br>Nsta/<l> Vgs AtmTConn/<h><br>Aap |                                       | 1203              |                           | ** bb PPEM300 gghh TBL |
|                      | Nsta/<i> Vgs                                                                                                                                                                                                                                                             |                                       | 1204              |                           | * bb PPEM302 gghh TBL  |
|                      | Nsta/<i> Vgs CasDefn/<z>                                                                                                                                                                                                                                                 |                                       | 1208              |                           | * bb PPEM302 gghh TBL  |
|                      | Lp/<x> Vsp PModule/<y>                                                                                                                                                                                                                                                   |                                       | 1209              |                           | * bb PPEM303 gghh TBL  |
|                      | Nsta/<x> Vgs Brag/<d><br>Q921/<r><br>Nsta/<i> Vgs BragS/<k><br>dBrag/<t> Q921                                                                                                                                                                                            |                                       | 1210              |                           | ** bb PPEM300 gghh TBL |
|                      | Nsta/<x> Vgs lua                                                                                                                                                                                                                                                         |                                       | 1211              |                           | ** bb PPEM300 gghh TBL |
|                      | Nsta/<x> Vgs Brag/<d> V5Link<br>LapV5/<w>                                                                                                                                                                                                                                |                                       | 1213              |                           | ** bb PPEM300 gghh TBL |
|                      | Nsta/<x> Vgs Tag/<u>                                                                                                                                                                                                                                                     |                                       | 1217              |                           | *Cbb PPEM302 gghh TBL  |
|                      | Nsta/<x> Vgs Ctrl/<n><br>Spd/<spd_name> IkePolicy/1                                                                                                                                                                                                                      |                                       | 1219              |                           | ** bb PPEM300 gghh TBL |
| 7060                 | ATM and Frame Resource Control alarms.<br>LP instance range (<n>): 0-15<br>Aqm instance range (<n2>): 0-3                                                                                                                                                                |                                       |                   |                           |                        |
|                      | LP/<n> Eng Fcrc                                                                                                                                                                                                                                                          |                                       | 1000              |                           | **bb PPEM300 gghh TBL  |
|                      | LP/<n> Eng Arc Aqm/<n2>                                                                                                                                                                                                                                                  |                                       | 1100              |                           | * bb PPEM300 gghh TBL  |

The following table specifies the alarms where field “event” has the value “message”. There won’t be a “clear” for these, but some action may still be required (e.g., security issue).

**Table 3 MSS15000 Message Alarms Supported for Succession VOA/VOIP**

| MSS15000 Index Group | Component Name                                                                                                                          | Solution Notes | MSS15000 Subindex | Importance Category | SCC2 Header              |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|---------------------|--------------------------|
| 0000                 | OSI administrative state changes, general engineering and memory alarms, etc.                                                           |                |                   |                     |                          |
|                      | These alarms can apply to many MSS15000 components. Often, it is:<br>EM/<nodename>                                                      |                | 9000              |                     | * bb CA eee gghh         |
|                      |                                                                                                                                         |                | 9001              |                     | TBL                      |
|                      |                                                                                                                                         |                | 9002              |                     | where:                   |
|                      |                                                                                                                                         |                | 9003              |                     | eee = 300, 302           |
| 7000                 | Provisioning alarms. These alarms apply to failures resulting from provisioning attempts. e.g., loading a provisioning file has failed. |                |                   |                     |                          |
|                      | Prov                                                                                                                                    |                | 0001              |                     | *Cbb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0002              |                     | * bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0003              |                     | *Cbb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0004              |                     | *Cbb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0005              |                     | * bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0006              |                     | *Cbb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0008              |                     | **bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0009              |                     | **bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0012              |                     | * bb PPEM306 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0013              |                     | * bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0015              |                     | * bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0016              |                     | * bb PPEM30? gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0029              |                     | * bb PPEM30? gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0030              |                     | * bb PPEM30? gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0031              |                     | * bb PPEM302 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0032              |                     | * bb PPEM30? gghh<br>TBL |
|                      | This alarm can apply to many MSS15000 components.                                                                                       |                | 0035              |                     | * bb PPEM307 gghh<br>TBL |
|                      | Prov                                                                                                                                    |                | 0039              |                     | * bb PPEM306 gghh<br>TBL |



| MSS150<br>00<br>Index<br>Group | Component Name                                                                                                                                                                                                                                                         | Solution<br>Notes | MSS1<br>5000<br>Subin<br>dex | Impor<br>tance<br>Categ<br>ory | SCC2 Header                                             |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------|--------------------------------|---------------------------------------------------------|
| 7002                           | Backplane control system alarms; e.g., communication failure between a card and the backplane. Note:<br>Card instance range (<n>): 0-15<br>FabricCard instance range (<i>): X,Y                                                                                        |                   |                              |                                |                                                         |
|                                | Shelf FabricCard/<i>                                                                                                                                                                                                                                                   |                   | 0010                         |                                | * bb PPEM303 gghh<br>TBL                                |
|                                | Shelf FabricCard/<i>                                                                                                                                                                                                                                                   |                   | 0012                         |                                | * bb PPEM303 gghh<br>TBL                                |
|                                | Shelf FabricCard/<i>                                                                                                                                                                                                                                                   |                   | 0013                         |                                | * bb PPEM303 gghh<br>TBL                                |
|                                | Shelf FabricCard/<i>                                                                                                                                                                                                                                                   |                   | 0014                         |                                | * bb PPEM303 gghh<br>TBL                                |
|                                | Shelf Card/<n>                                                                                                                                                                                                                                                         |                   | 1000                         |                                | *Cbb PPEM303 gghh<br>TBL                                |
| 7003                           | Data collection system alarms; e.g., an alarm or log queue size has exceeded a threshold.<br>Collector instance range (<t>): accounting, alarm, log, debug, scn, trap, stats, rtstats, appl<br>Agent instance range (<n>): 0-15                                        |                   |                              |                                |                                                         |
|                                | Collector/<t> Agent/<n>                                                                                                                                                                                                                                                |                   | 0004                         |                                | * bb PPEM301 gghh<br>TBL                                |
|                                | Collector/log Spooler                                                                                                                                                                                                                                                  |                   | 0008                         |                                | * bb PPEM306 gghh<br>TBL                                |
| 7006                           | Network Management Interface system alarms and Radius security alarms.<br>Management Interface type (<type>): Fmip, Ftp, Local, Telnet<br>Session instance range (<n>): 1-35 (Fmip); 1-16 (Ftp); 1-2 (Local); 1-16 (Telnet)<br>Radius Server instance range (<m>): 0-1 |                   |                              |                                |                                                         |
|                                | Nmis <type>                                                                                                                                                                                                                                                            |                   | 0001                         |                                | **bb PPEM305 gghh<br>TBL                                |
|                                | Nmis <type> Session/<n>                                                                                                                                                                                                                                                |                   | 0002                         |                                | * bb PPEM305 gghh<br>TBL                                |
|                                | Nmis <type> Session/<n>                                                                                                                                                                                                                                                |                   | 0003                         |                                | **bb PPEM300 gghh<br>TBL                                |
|                                | Nmis Ftp                                                                                                                                                                                                                                                               |                   | 0005                         |                                | **bb PPEM302 gghh<br>TBL                                |
|                                | Nmis Fmip                                                                                                                                                                                                                                                              |                   | 0006                         |                                | **bb PPEM305 gghh<br>TBL                                |
|                                | Nmis <type> Session/<n>                                                                                                                                                                                                                                                |                   | 0007                         |                                | **bb PPEM300 gghh<br>TBL                                |
|                                | Nmis Fmip                                                                                                                                                                                                                                                              |                   | 0008                         |                                | **bb PPEM300 gghh<br>TBL                                |
|                                | Ac                                                                                                                                                                                                                                                                     |                   | 0009                         |                                | * bb PPEM300 gghh<br>TBL or<br>* bb PPEM305 gghh<br>TBL |
|                                | Ac Radius Server/<m>                                                                                                                                                                                                                                                   |                   | 0101                         |                                | **bb PPEM305 gghh<br>TBL                                |
|                                | Ac Radius Server/<m>                                                                                                                                                                                                                                                   |                   | 0102                         |                                | **bb PPEM305 gghh<br>TBL                                |
|                                | Ac Radius                                                                                                                                                                                                                                                              |                   | 0103                         |                                | **bb PPEM305 gghh<br>TBL                                |
|                                | Ac Radius                                                                                                                                                                                                                                                              |                   | 0104                         |                                | **bb PPEM305 gghh<br>TBL                                |

| MSS150<br>00<br>Index<br>Group | Component Name                                                                                                                                                                                                                                                | Solution<br>Notes | MSS1<br>5000<br>Subin<br>dex | Impor<br>tance<br>Categ<br>ory | SCC2 Header              |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------|--------------------------------|--------------------------|
|                                | Ac Radius Server/<m>                                                                                                                                                                                                                                          |                   | 0105                         |                                | **bb PPEM305 gghh<br>TBL |
| 7008                           | File system alarms.<br>Disk instance range (<n>): 0-1<br>Card instance range (<x>): 0-1                                                                                                                                                                       |                   |                              |                                |                          |
|                                | FileSystem                                                                                                                                                                                                                                                    |                   | 1003                         |                                | **bb PPEM302 gghh<br>TBL |
|                                | FileSystem Disk/<n>                                                                                                                                                                                                                                           |                   | 1012                         |                                | * bb PPEM303 gghh<br>TBL |
|                                | FileSystem Disk/<n>                                                                                                                                                                                                                                           |                   | 1013                         |                                | **bb PPEM303 gghh<br>TBL |
|                                | FileSystem Disk/<n>                                                                                                                                                                                                                                           |                   | 1014                         |                                | **bb PPEM307 gghh<br>TBL |
|                                | FileSystem Disk/<n>                                                                                                                                                                                                                                           |                   | 1015                         |                                | * bb PPEM307 gghh<br>TBL |
|                                | FileSystem Disk/<n>                                                                                                                                                                                                                                           |                   | 1016                         |                                | * bb PPEM307 gghh<br>TBL |
|                                | FileSystem Disk/<n>                                                                                                                                                                                                                                           |                   | 1018                         |                                | * bb PPEM303 gghh<br>TBL |
|                                | FileSystem                                                                                                                                                                                                                                                    |                   | 1020                         |                                | * bb PPEM303 gghh<br>TBL |
|                                | Shelf Card/<x>                                                                                                                                                                                                                                                |                   | 1021                         |                                | **bb PPEM303 gghh<br>TBL |
| 7011                           | Port management system and Automatic Protection Switching alarms.<br>LP instance range (<n>): 0-15<br>Port types (<type>): Sonet, DS3<br>Sonet instance range (<n2>): 0-15 (16-port); 0-3 (4-port)<br>DS3 instance range (<n2>): 0-11 (12-port); 0-3 (4-port) |                   |                              |                                |                          |
|                                | LP/<n> <type>/<n2>                                                                                                                                                                                                                                            |                   | 2002                         |                                | **bb PPEM303 gghh<br>TBL |
|                                | LP/<n> DS3/<n2>                                                                                                                                                                                                                                               |                   | 5112                         |                                | * bb PPEM300 gghh<br>TBL |
|                                | LP/<n> <type>/<n2>                                                                                                                                                                                                                                            |                   | 8000                         |                                | * bb PPEM300 gghh<br>TBL |
| 7012                           | Processor control system alarms.<br>LP instance range (<n>): 0-15<br>Card instance range (<n>): 0-15                                                                                                                                                          |                   |                              |                                |                          |
|                                | Shelf                                                                                                                                                                                                                                                         |                   | 0054                         |                                | **bb PPEM303 gghh<br>TBL |
|                                | Shelf Card/<n>                                                                                                                                                                                                                                                |                   | 0101                         |                                | * bb PPEM303 gghh<br>TBL |
|                                | Shelf Card/<n>                                                                                                                                                                                                                                                |                   | 0102                         |                                | * bb PPEM301 gghh<br>TBL |
|                                | Shelf Card/<n>                                                                                                                                                                                                                                                |                   | 0151                         |                                | **bb PPEM302 gghh<br>TBL |
|                                |                                                                                                                                                                                                                                                               |                   | 0152                         |                                |                          |
|                                |                                                                                                                                                                                                                                                               |                   | 0153                         |                                |                          |
|                                | Shelf Card/<n>                                                                                                                                                                                                                                                |                   | 0154                         |                                | **bb PPEM303 gghh<br>TBL |
|                                |                                                                                                                                                                                                                                                               |                   | 0155                         |                                |                          |
|                                |                                                                                                                                                                                                                                                               |                   | 0156                         |                                |                          |

| MSS150<br>00<br>Index<br>Group | Component Name                                                                                                                                                                                                                                                                                                                          | Solution<br>Notes | MSS1<br>5000<br>Subin<br>dex | Impor<br>tance<br>Categ<br>ory | SCC2 Header                                                      |
|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|------------------------------|--------------------------------|------------------------------------------------------------------|
|                                | LP/<n>                                                                                                                                                                                                                                                                                                                                  |                   | 0201                         |                                | * bb PPEM306 gghh<br>TBL                                         |
|                                | LP/0                                                                                                                                                                                                                                                                                                                                    |                   | 0203                         |                                | * bb PPEM303 gghh<br>TBL                                         |
|                                | LP/<n>                                                                                                                                                                                                                                                                                                                                  |                   | 0204                         |                                | * bb PPEM306 gghh<br>TBL                                         |
|                                | Shelf Card/<n> SpServ                                                                                                                                                                                                                                                                                                                   |                   | 0300                         |                                | aabb PPEMeee gghh<br>TBL<br>where:<br>aa = “*C”, “* “<br>eee=any |
| 7015                           | Network time-of-day (TOD) synchronization alarms.                                                                                                                                                                                                                                                                                       |                   |                              |                                |                                                                  |
|                                | Time                                                                                                                                                                                                                                                                                                                                    |                   | 0001                         |                                | * bb PPEMeee gghh<br>TBL<br>eee=304, 306, 307                    |
| 7017                           | Network clock synchronization alarms.                                                                                                                                                                                                                                                                                                   |                   |                              |                                |                                                                  |
|                                | Ns                                                                                                                                                                                                                                                                                                                                      |                   | 1001                         |                                | * bb PPEM301 gghh<br>TBL                                         |
| 7021                           | Internet protocol alarms. For Succession VOA, the IP stack is used only for network management connectivity purposes. For VOIP VR is used to connect to IP network. OSPF and IP static Routes can be used. More than 1 VR can be provisioned.<br>VR instance range (<i>): any string, but often specified simply as a digit (e.g., “0”) |                   |                              |                                |                                                                  |
|                                | VR/<i> Ip<br>VR/<i> Ip OSPF<br>VR/<i> Ip OSPF                                                                                                                                                                                                                                                                                           |                   | 0000                         |                                | * bb PPEM302 gghh<br>TBL                                         |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   | 1000                         |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   | 1001                         |                                |                                                                  |
|                                | VR/<i> Ip OSPF                                                                                                                                                                                                                                                                                                                          |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   | 1011                         |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                |                                                                                                                                                                                                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                | VR/<i> Ip OSPF                                                                                                                                                                                                                                                                                                                          |                   | 1016                         |                                | **bb PPEM302 gghh<br>TBL                                         |
|                                | VR/<i> Ip OSPF                                                                                                                                                                                                                                                                                                                          |                   | 1100                         |                                | * bb PPEM300 gghh<br>TBL                                         |
| 7026                           | LAN port management system alarms. For Succession VOA, the LAN port management system is used only for network management connectivity purposes. For VOIP same alarms are used.                                                                                                                                                         |                   |                              |                                |                                                                  |
|                                | LP/0 OamEnet/0                                                                                                                                                                                                                                                                                                                          |                   | 3002                         |                                | * bb PPEM30? gghh<br>TBL                                         |
|                                | LP/0 OamEnet/0                                                                                                                                                                                                                                                                                                                          |                   | 3003                         |                                | * bb PPEM303 gghh<br>TBL                                         |
|                                | LP/0 OamEnet/0                                                                                                                                                                                                                                                                                                                          |                   | 3006                         |                                | * bb PPEM302 gghh<br>TBL                                         |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                                   | Solution Notes | MSS15000 Subindex | Importance Category | SCC2 Header            |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|---------------------|------------------------|
| 7039                 | ATM Core alarms.<br>AtmIf instance range (<n>): 1-4095<br>Vcc instance range (<n2.n3>): n2 is VPI; n3 is VCI                                                                                                                                                                                                                                                                                                                     |                |                   |                     |                        |
|                      | AtmIf/<n> Vcc/<n2.n3>                                                                                                                                                                                                                                                                                                                                                                                                            |                | 2001              |                     | * bb PPEM302 gghh TBL  |
|                      | AtmIf/<n>                                                                                                                                                                                                                                                                                                                                                                                                                        |                | 4000              |                     | * bb PPEM300 gghh TBL  |
| 7041                 | ATM Networking alarms.<br>AtmIf instance range (<n>): 1-4095<br>CfgNode instance range (<n>): 0-104<br>Top instance range (<n>): 0-104<br>Node instance range (<id>): 44-hex digit id<br>Vpt instance range (<n2>): 0-4095                                                                                                                                                                                                       |                |                   |                     |                        |
|                      | AtmIf/<n> Uni                                                                                                                                                                                                                                                                                                                                                                                                                    |                | 0000              |                     | * bb PPEM306 gghh TBL  |
|                      | AtmIf/<n> Uni                                                                                                                                                                                                                                                                                                                                                                                                                    |                | 0001              |                     | * bb PPEM303 gghh TBL  |
|                      | AtmIf/<n> Uni Ilmi                                                                                                                                                                                                                                                                                                                                                                                                               |                | 0051              |                     | **bb PPEM300 gghh TBL  |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                  |                |                   |                     |                        |
|                      | AtmIf/<n> Uni<br>AtmIf/<n> Pnni<br>AtmIf/<n> Vpt/<n2> Uni<br>AtmIf/<n> Vpt/<n2> Pnni                                                                                                                                                                                                                                                                                                                                             |                | 0151              |                     | *Cbb PPEM300 gghh TBL  |
|                      | AtmIf/<n> Pnni Rcc                                                                                                                                                                                                                                                                                                                                                                                                               |                | 0251              |                     | **bb PPEM300 gghh TBL  |
|                      | AtmIf/<n> Pnni Rcc                                                                                                                                                                                                                                                                                                                                                                                                               |                | 0252              |                     | **bb PPEM300 gghh TBL  |
|                      | Artg Pnni Top/<n> Node/<id>                                                                                                                                                                                                                                                                                                                                                                                                      |                | 0602              |                     | **bb PPEM301 gghh TBL  |
|                      | Artg                                                                                                                                                                                                                                                                                                                                                                                                                             |                | 0603              |                     | **bb PPEM303 gghh TBL  |
| 7056                 | Voice Services Processor (VSP) / Narrowband Service Trunk over ATM (Nsta)<br>This group is specific to MG15000 application (e.g. severe failure of the VSP card)<br>Lp instance range (<x>): 0-15<br>PModule instance range (<y>): 1-24<br>PBlock instance range (<z>): 1-2<br>NSTA instance range (<i>): 0-15999<br>Conn instance range (<l>): 0-128<br>Brag instance range (<d>): 0-159999<br>BragS instance range (<p>): 0-15 |                |                   |                     |                        |
|                      | Lp/<x> Vsp PModule/<y>                                                                                                                                                                                                                                                                                                                                                                                                           |                | 0006              |                     | * bb PPEM303 gghh TBL  |
|                      | Nsta/<i> Conn/<l> Brag/<d> Ccst                                                                                                                                                                                                                                                                                                                                                                                                  |                | 1101              |                     | * bb PPEM300 gghh TBL  |
|                      | Nsta/<i> Vgs lua                                                                                                                                                                                                                                                                                                                                                                                                                 |                | 1212              |                     | * bb PPEM300 gghh TBL  |
|                      | Lp/<x> Vsp PModule/<y>                                                                                                                                                                                                                                                                                                                                                                                                           |                | 1214              |                     | **bb PPEM302 gghh TBL  |
|                      | Nsta/<i> Vgs BragS/<p>                                                                                                                                                                                                                                                                                                                                                                                                           |                | 1215              |                     | ** bb PPEM302 gghh TBL |

| MSS15000 Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                 | Solution Notes | MSS15000 Subindex | Importance Category | SCC2 Header              |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------|---------------------|--------------------------|
| 7060                 | ATM and Frame Resource Control alarms.<br>LP instance range (<n>): 0-15                                                                                                                                                                                                                                                                                                                                        |                |                   |                     |                          |
|                      | LP/<n> Eng Arc Ov<br>LP/<n> Eng<br>LP/<n> Eng<br>LP/<n> Eng<br>LP/<n> Eng                                                                                                                                                                                                                                                                                                                                      |                | 1200              |                     | * bb PPEM301 gghh<br>TBL |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                |                | 1300              |                     |                          |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                |                | 1400              |                     |                          |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                |                | 1500              |                     |                          |
|                      |                                                                                                                                                                                                                                                                                                                                                                                                                |                | 1600              |                     |                          |
| 7061                 | Security policy violation alarms.<br>VR instance range (<i>): any string, but often specified simply as a digit.<br><spd_name>: name of the security policy database<br><pol_id>: instance number of the Policy component<br><ip_addr,esp,spi>: IP address of the peer with which this SecurityAssociation component is established, the security protocol (ESP), and the Security Parameter Index (SPI) value |                |                   |                     |                          |
|                      | Vr/<i> Ip Spd/<spd_name><br>Pol/<pol_id> Sa/<ip_addr,esp,spi>                                                                                                                                                                                                                                                                                                                                                  |                | 0001              |                     | **bb PPEM305 gghh<br>TBL |
|                      | 7071 LAN ApplicationLAN application instance (<n>): 0-255                                                                                                                                                                                                                                                                                                                                                      |                |                   |                     |                          |
|                      | LA/<n>                                                                                                                                                                                                                                                                                                                                                                                                         |                | 1000              |                     | *Cbb PPEM302 gghh<br>TBL |
| 7080                 | Software file system.<br><name> = name of the software application                                                                                                                                                                                                                                                                                                                                             |                |                   |                     |                          |
|                      | Sw Av/<name>                                                                                                                                                                                                                                                                                                                                                                                                   |                | 0100              |                     | **bb PPEM302 gghh<br>TBL |

Reference [6] provides detailed descriptions of MSS15000 alarm logs, of which only a portion are applicable for Succession VOA/VOIP.

## 4. MDM Alarm Logs

Table 4 presents the list of MDM and MDM proxy set/clear alarm logs that are applicable for Succession VOA/VOIP. Table 5 presents the list of MDM and MDM proxy message alarm logs that are applicable for Succession VOA/VOIP.

Applicable MDM set/clear alarms logs include those due to MDM software failure, and alarms related to the monitoring of the platform on which MDM is operating. MDM proxy alarm logs are alarms that MDM initiates on behalf of MSS15000 (for a number of reasons) and injects into the MSS15000 alarm log stream.

The table does not explicitly state all MDM clear alarm logs that correspond to each set. The clear differs from its corresponding set by only the first two characters. The characters “aa” are replaced by “ ” (two spaces). This format is presented in Table 1.

The MDM alarm identifier consists of an eight-digit number identifying the alarm. The first four digits comprise the **Index Group**, which represents logical groupings of alarms. The last four digits are the **SubIndex**, which is an identifier within each index group.

**Component Name** indicates the managed object against which the alarm Log is generated. This table contains the CLI format of a component name. The “compld” field in SCC2 format contains this information (with the module’s <nodename> pre-pended). Also, “compld” follows the MDM API-style format (with component type and instance separated by a space instead of a slash, and ‘\$’ appearing in place of a null instance value). Variables (usually instance value ranges) are denoted by <> and the reader should reference the Alarms NTP’s [3] and [4] for further information.

**Table 4 MDM Set/Clear Alarms Supported for Succession VOA/VOIP**

| MDM Index Group | Component Name                                                                                                                                                                                                                                                                                                        | N/A | MDM SubIndex | Importance category (N/A) | SCC2 Header                                                                     |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|---------------------------|---------------------------------------------------------------------------------|
| 0999            | Loss of access to a MSS15000 shelf from MDM. MDM tries to reconnect and when it succeeds in doing so, will do a “state walk” of major components on the shelf and issue alarms for those components that are out-of-service. EM instance range (<nodename>): a string, typically the CLLI identifier for the MSS15000 |     |              |                           |                                                                                 |
|                 | EM/<nodename>                                                                                                                                                                                                                                                                                                         |     | 0001         |                           | *Cbb MDM 303 gghh TBL                                                           |
| 0999            | MDM Proxy-alarm. MDM-originated alarm sent on behalf of the MSS15000, either due to a state walk or a state-change notification.                                                                                                                                                                                      |     |              |                           |                                                                                 |
|                 | This alarm can apply to many MSS15000 components.                                                                                                                                                                                                                                                                     |     | 0012         |                           | **bb PPEMeee gghh TBL<br>where:<br>eee = 300, 301, 302, 303, 304, 305, 306, 307 |

| MDM Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | N/A | MDM SubIndex | Importance category (N/A) | SCC2 Header                                                |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|---------------------------|------------------------------------------------------------|
| 3010            | <p>Indicates faults on MDM server processes, which are needed by the MDM tools/applications. The MDM Log Display GUI or corresponding Unix Utility (nmslog) may also be used to find the information for the cause of the problem.</p> <p>NMS instance range (&lt;x&gt;): a string, typically the hostname of the MDM server platform</p> <p>APP instance range (&lt;a&gt;): a string, denoting the name of an MDM software application</p> <p>Autopatch nodes (&lt;nodes parameter&gt;): typically, this is the name of an HGDS group or a node name or file name containing a list of node names.</p> <p>EM node name (&lt;node name&gt;): the name of the MSS15000 or MG15000 shelf</p>                                                                                                                                                                                                                                                                               |     |              |                           |                                                            |
|                 | NMS/<x> APP/<a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | 0000         |                           | **bb MDM 302 gghh TBL                                      |
|                 | NMS/<x> APP/PPAUTOPATCH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | 0801         |                           | *bb MDM 306 gghh TBL                                       |
|                 | NMS/<x> APP/PPAUTOPATCH NODES/<nodes parameter>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | 0802         |                           | *bb MDM 302 gghh TBL                                       |
|                 | NMS/<x> APP/PPAUTOPATCH NODES/<nodes parameter>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | 0803         |                           | **bb MDM 302 gghh TBL                                      |
|                 | NMS/<x> APP/PPAUTOPATCH EM/<node name>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | 0820         |                           | **bb MDM 302 gghh TBL                                      |
|                 | NMS/<x> APP/PPAUTOPATCH EM/<node name>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |     | 0821         |                           | **bb MDM 302 gghh TBL                                      |
| 3011            | <p>MDM Platform monitoring; e.g. Solaris and Sun monitoring, including: CPU, disk space, memory, local ports and connectivity to adjacent neighbors. The severity of resource problems are determined via thresholds. Connectivity problems are determined using ping command.</p> <p>The alarms 3011 xxFF (where xx can be 01,02,03,04,05,06, or 07) are clear alarms only. A single 3011xxFF alarm clears all outstanding alarms from 3011xx00 through 3011xx99.</p> <p>NMS instance range (&lt;x&gt;): a string, typically the hostname of the MDM server platform</p> <p>APP instance range (&lt;a&gt;): a string, denoting the name of an MDM software application</p> <p>DISK instance range (&lt;v&gt;): a string, denoting disk volume name</p> <p>CPU instance range (&lt;c&gt;): a string, denoting the CPU id</p> <p>PORT and CONNECTION instance range (&lt;ip&gt;): an IP address or host name</p> <p>SDS instance range (&lt;d&gt;): logical disk name</p> |     |              |                           |                                                            |
|                 | NMS/<x> APP/<a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | 0001         |                           | *Cbb MDM 303 gghh TBL                                      |
|                 | NMS/<x> DISK/<v>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |     | 0100         |                           | aabb MDM 303 gghh TBL<br>where:<br>aa = "C", " ", " ", " " |
|                 | NMS/<x> CPU/<c>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |     | 0200         |                           | aabb MDM 303 gghh TBL<br>where:<br>aa = "C", " ", " ", " " |
|                 | NMS/<x> MEMORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |     | 0300         |                           | aabb MDM 303 gghh TBL<br>where:<br>aa = "C", " ", " ", " " |
|                 | NMS/<x> PORT/<ip>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | 0401         |                           | **bb MDM 303 gghh TBL                                      |
|                 | NMS/<x> CONNECTION/<ip>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |     | 0501         |                           | *Cbb MDM 303 gghh TBL                                      |

| MDM Index Group | Component Name  | N/A | MDM SubIndex | Importance category (N/A) | SCC2 Header                                         |
|-----------------|-----------------|-----|--------------|---------------------------|-----------------------------------------------------|
|                 | NMS/<x> SDS/<d> |     | 0600         |                           | *Cbb MDM 303 gghh TBL                               |
|                 | NMS/<x>         |     | 0700         |                           | aabb MDM 303 gghh TBL<br>where:<br>aa = “*C”, “***” |
|                 | NMS/<x>         |     | 01FF         |                           | bb MDM 303 gghh TBL                                 |
|                 |                 |     | 02FF         |                           | bb MDM 303 gghh TBL                                 |
|                 |                 |     | 03FF         |                           | bb MDM 303 gghh TBL                                 |
|                 |                 |     | 04FF         |                           | bb MDM 303 gghh TBL                                 |
|                 |                 |     | 05FF         |                           | bb MDM 303 gghh TBL                                 |
|                 |                 |     | 06FF         |                           | bb MDM 303 gghh TBL                                 |
|                 |                 |     | 07FF         |                           | bb MDM 303 gghh TBL                                 |

Reference [4] provides detailed descriptions of MDM and MDM proxy alarm logs, of which only a portion are applicable for Succession VOA/VOIP.

**Table 5 MDM Message Alarms Supported for Succession VOA/VOIP**

| MDM Index Group | Component Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | N/A | MDM SubIndex | Importance category (N/A) | SCC2 Header           |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|---------------------------|-----------------------|
| 0999            | MDM proxy-alarm. Issued when a loss of redundancy of alarm feed occurs. The MDM has lost its direct network alarm feed, but is still collecting them from its mate MDM.<br>Note that this message alarm will not be issued for all conditions that could lead to a loss of redundancy, nor is it “cleared” when the problem is resolved. Thus, we do not recommend that this alarm be keyed upon, but include it here because it is likely to be seen.<br><deviceType> is any IP-enabled device, such as “EM” or “PP8600”.<br><nodeName> is the name of the device or shelf. |     |              |                           |                       |
|                 | <deviceType>/<nodeName>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |     | 0100         |                           | * bb MDM 303 gghh TBL |
| 3010            | Indicates faults on MDM server processes, which are needed by the MDM tools/applications. The MDM Log Display GUI or corresponding Unix Utility (nmslog) may also be used to find the information for the cause of the problem.<br>NMS instance range (<x>): a string, typically the hostname of the MDM server platform<br>GROUP instance range (<g>): a string, which is the HGDS group name for a set of MSS15000s<br>PP instance range (<nodename>): a string, typically the CLLI identifier for the MSS15000                                                            |     |              |                           |                       |
|                 | NMS/<x> GROUP/<g>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |     | 0700         |                           | * bb MDM 305 gghh TBL |
|                 | NMS/<x> PP/<nodename>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |     | 0701         |                           | * bb MDM 300 gghh TBL |



| MDM Index Group | Component Name                                                                                                                                                                                           | N/A | MDM SubIndex | Importance category (N/A) | SCC2 Header                                              |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------|---------------------------|----------------------------------------------------------|
|                 | NMS/<x> PP/<nodename>                                                                                                                                                                                    |     | 0702         |                           | * bb MDM 300 gghh TBL                                    |
|                 | NMS/<x><br>APPL/TODCHANGEVER                                                                                                                                                                             |     | 0703         |                           | * bb MDM 304 gghh TBL                                    |
| 600x            | MDP application alarms.<br>NMS instance range (<x>): a string, typically the hostname of the MDM server platform<br>MDP instance range (<a>): a string, denoting the name of an MDP software application |     |              |                           |                                                          |
|                 | NMS/<x> MDP/<a>                                                                                                                                                                                          |     | 00001-40000  |                           | aabb MDM 307 gghh TBL<br>where:<br>aa = “*C”, “**”, “* “ |

## 5. SN06(VOA)-to-SN06.2(VOA/VOIP) Delta Summary

The following table captures the SN06.2 (VOA/VOIP) alarm log delta that includes MG15000 application as compared with SN06 (VOA) documentation that did not include any MG15000 application specifics

**Table 6 SN06 (non MG15000 content) -to-SN06.2 (including MG15000 content) Change Summary Description**

| Fault Code     | Description of Change |
|----------------|-----------------------|
| SET ALARMS     |                       |
| 70115400       | New                   |
| 70115401       | New                   |
| 70115402       | New                   |
| 70115403       | New                   |
| 70115480       | New                   |
|                |                       |
| 7026 3000      | New                   |
|                |                       |
| 7056 0002      | New                   |
| 7056 0003      | New                   |
| 7056 0500      | New                   |
| 7056 0501      | New                   |
| 7056 0502      | New                   |
| 7056 1000      | New                   |
| 7056 1200      | New                   |
| 7056 1201      | New                   |
| 7056 1202      | New                   |
| 7056 1203      | New                   |
| 7056 1204      | New                   |
| 7056 1209      | New                   |
| 7056 1210      | New                   |
| 7056 1211      | New                   |
| 7056 1213      | New                   |
|                |                       |
| MESSAGE Alarms |                       |
|                |                       |
| 7000 0039      | New                   |
|                |                       |
| 7021 1000      | New                   |
| 7021 1002      | New                   |
| 7021 1003      | New                   |
| 7021 1004      | New                   |
| 7021 1005      | New                   |
| 7021 1006      | New                   |
| 7021 100B      | New                   |
| 7021 1100      | New                   |
|                |                       |
| 7056 1101      | New                   |
| 7056 1212      | New                   |
| 70561214       | New                   |
| 7056 1215      | New                   |
|                |                       |

|           |     |
|-----------|-----|
| 7060 1300 | New |
| 7060 1400 | New |
| 7060 1500 | New |
| 7060 1600 | New |
|           |     |
| 7071 1200 | New |

## 6. SN06.2-to-SN07(VOA/VOIP) Delta Summary

The following table captures the SN07 (VOA/VOIP) alarm log delta as compared with SN06.2 (VOA/VOIP) documentation.

**Table 7 SN06.2-to-SN07 Change Summary Description**

| <b>Fault Code</b>     | <b>Description of Change</b> |
|-----------------------|------------------------------|
| <b>SET ALARMS</b>     |                              |
| 7000 0041             | New                          |
|                       |                              |
| 7011 1500             | New                          |
| 7011 1501             | New                          |
| 7011 5254             | New                          |
| 7011 5255             | New                          |
| 7011 5256             | New                          |
|                       |                              |
| 7012 0059             | New                          |
|                       |                              |
| 7021 0013             | New                          |
| 7021 0014             | New                          |
|                       |                              |
| 7041 0700             | New                          |
| 7041 0701             | New                          |
| 7041 0703             | New                          |
|                       |                              |
| 7056 1208             | New                          |
| 7056 1217             | New                          |
|                       |                              |
| 0999 0004             | New                          |
| 3011 01FF             | New                          |
| 3011 02FF             | New                          |
| 3011 03FF             | New                          |
| 3011 04FF             | New                          |
| 3011 05FF             | New                          |
| 3011 06FF             | New                          |
| 3011 07FF             | New                          |
|                       |                              |
| <b>MESSAGE Alarms</b> |                              |
| 7003 0008             | New                          |
| 7008 1021             | New                          |
|                       |                              |
| 7021 1021             | New                          |
| 7021 1101             | New                          |
|                       |                              |

|           |     |
|-----------|-----|
| 7041 0151 | New |
| 7056 0006 | New |
| 7080 0100 | New |

## 7. SN07-to-SN08 (VOA/VOIP) Delta Summary

The following table captures the SN08 (VOA/VOIP) alarm log delta as compared with SN07 (VOA/VOIP) documentation.

**Table 8 SN07-to-SN08 Change Summary Description**

| <b>Fault Code</b>     | <b>Description of Change</b>                                   |
|-----------------------|----------------------------------------------------------------|
| <b>SET ALARMS</b>     |                                                                |
| 7000 0041             | Changed                                                        |
| 7002 0003             | Changed                                                        |
| 7002 0004             | New                                                            |
| 7006 0100             | New                                                            |
| 7021 1002             | Changed                                                        |
| 7021 1003             | Changed                                                        |
| 7041 0052             | New                                                            |
| 7056 1219             | New                                                            |
| 0999 0004             | Removed (applies only to PP8600 and other DCD managed devices) |
| 3010 0801             | New                                                            |
| 3010 0802             | New                                                            |
| 3010 0803             | New                                                            |
| 3010 0820             | New                                                            |
| 3010 0821             | New                                                            |
| <b>MESSAGE Alarms</b> |                                                                |
| 0999 0100             | New                                                            |
| 7006 0009             | New                                                            |
| 7006 0101             | New                                                            |
| 7006 0102             | New                                                            |
| 7006 0103             | New                                                            |
| 7006 0104             | New                                                            |
| 7006 0105             | New                                                            |
| 7061 0001             | New                                                            |
|                       |                                                                |
|                       |                                                                |

## 8. References

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2. Passport 15000 for Universal Access – AAL1 (SN06) Integrated Solution Specification, Issue 3.04, Oct 22, 2002
3. NTP 241-6001-501 Nortel Networks Multiservice Data Manager Alarms Reference, 15.2D1, Oct 2004.
4. NTP 241-6001-309 Preside MDM Management Data Provider User Guide, 14.3RSUP, 2003.
5. Supernode Data Manager - Log Applications Enhancement Design Summary (DSUM), 2002.
6. NTP NN10600-500 Multiservice Switch 7400/15000/20000 Alarms Reference, 6.1S2, Nov 2004
7. NTP NN10092-911 Nortel Networks Multiservice Switch 15000 Media Gateway 15000 and Preside MDM in Succession Networks Fault Management Overview PT-AAL1/UA-AAL1/UA-IP, SN07S1, Dec 2004

## Appendix D: USP Operational Measurements

| OM TYPE         | OM TITLE                                          | OM DESCRIPTION                                                                                                                                                                                                                                                                                                                                           |
|-----------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | ATM Driver Messaging, Plane 1 CRC Error Count     | This OM measures the number of Plane 1 CRC errors.                                                                                                                                                                                                                                                                                                       |
| Accumulation OM | AS Master, BICC Discard Count                     | This OM measures the number of BICC origination messages that were discarded due to Core Overload Control.                                                                                                                                                                                                                                               |
| Accumulation OM | AS Master, BSSAP Discard Count                    | This OM measures the number of SCCP connection request messages for the BSSAP subsystem that were discarded due to Core Overload Control.                                                                                                                                                                                                                |
| Accumulation OM | AS Master, Core Overload Duration                 | This OM measures the total time, in seconds, that the Core was in Overload.                                                                                                                                                                                                                                                                              |
| Accumulation OM | AS Master, ISUP Discard Count                     | This OM measures the number of ISUP origination messages that were discarded due to Core Overload Control.                                                                                                                                                                                                                                               |
| Accumulation OM | AS Master, RANAP Discard Count                    | This OM measures the number of SCCP connection request messages for the RANAP subsystem that were discarded due to Core Overload Control.                                                                                                                                                                                                                |
| Accumulation OM | AS Master, TUP Discard Count                      | This OM measures the number of TUP origination messages that were discarded due to Core Overload Control.                                                                                                                                                                                                                                                |
| Accumulation OM | ASP Path Management, Path Down Time               | This OM measures the total time that a Path was in the Down state.                                                                                                                                                                                                                                                                                       |
| Accumulation OM | ASP Path Management, Path entered Down state      | This OM measures the total number of times per measurement period that a Path entered the Down state.                                                                                                                                                                                                                                                    |
| Accumulation OM | ASP Path Management, Path entered Restoring state | This OM measures the total number of times per measurement period that a Path entered the Restoring state.                                                                                                                                                                                                                                               |
| Accumulation OM | ASP Path Management, Path entered Up state        | This OM measures the total number of times per measurement period that a Path entered the Up state.                                                                                                                                                                                                                                                      |
| Accumulation OM | ASP Path Management, Path Restore Time            | This OM measures the total time that a Path was in the Restoring state.                                                                                                                                                                                                                                                                                  |
| Accumulation OM | ASP Path Management, Path Up Time                 | This OM measures the total time that a Path was in the Up state.                                                                                                                                                                                                                                                                                         |
| Accumulation OM | ASP Path Traffic, Discarded MSUs Count            | This OM measures the total number of received MSUs on an ASP Path which were discarded because the Network Appearance (or System Identity) associated with the incoming message was not found on the USP                                                                                                                                                 |
| Accumulation OM | ASP Path Traffic, Discarded MTP3b MSUs Count      | This OM measures the total number of received MTP3B MSUs (> 272 octets) on an ASP Path which were discarded because the outgoing link is not MTP3B capable. This doesn't apply to SCCP/LUDT messages since on IPS7 Paths, these messages will be segmented and then sent out. For non-SCCP messages such as BICC messages > 272 octets, this will apply. |
| Accumulation OM | ASP Path Traffic, Originated MSUs Count           | This OM measures the number of originated MSUs (MSUs that contain the PC or capability code for the USP in the OPC field) that are successfully passed to the ASP Path for transmission (for example, network management messages).                                                                                                                      |
| Accumulation OM | ASP Path Traffic, Received MSUs Count             | This OM measures the total number of received MSUs on an ASP Path                                                                                                                                                                                                                                                                                        |

| OM TYPE         | OM TITLE                                          | OM DESCRIPTION                                                                                                                                                                                                                              |
|-----------------|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | ASP Path Traffic, Sent MSUs Count                 | This OM measures the number of through-switched MSUs (MSUs that do not contain the PC or capability code for the USP in either the OPC or DPC) that are acknowledged, translated, and successfully passed to the ASP Path for transmission. |
| Accumulation OM | ASP Path Traffic, Terminated MSUs Count           | This OM measures the number of terminated MSUs (acknowledged, incoming MSUs that contain the PC or capability code of the USP in the DPC field) received.                                                                                   |
| Accumulation OM | ASP Path Utilization, DAUD Received Count         | This OM measures the number of destination audit (DAUD) messages transmitted.                                                                                                                                                               |
| Accumulation OM | ASP Path Utilization, DAVA Transmitted Count      | This OM measures the number of destination available (DAVA) messages transmitted.                                                                                                                                                           |
| Accumulation OM | ASP Path Utilization, DUNA Transmitted Count      | This OM measures the number of destination unavailable messages transmitted.                                                                                                                                                                |
| Accumulation OM | ASP Path Utilization, DUPU Transmitted Count      | This OM measures the number of destination user part unavailable messages transmitted.                                                                                                                                                      |
| Accumulation OM | ASP Path Utilization, SCON Transmitted Count      | This OM measures the number of Signaling Congestion (SCON) messages transmitted.                                                                                                                                                            |
| Accumulation OM | ATM Driver Messaging, Duplicate Messages Count    | This OM measures the number of duplicate messages.                                                                                                                                                                                          |
| Accumulation OM | ATM Driver Messaging, IP Message Count            | This OM measures the number of incoming IP messages.                                                                                                                                                                                        |
| Accumulation OM | ATM Driver Messaging, Plane 1 Messages Count      | This OM measures the number of incoming Plane 1 messages.                                                                                                                                                                                   |
| Accumulation OM | ATM Driver Messaging, Plane 2 CRC Error Count     | This OM measures the number of Plane 2 CRC errors.                                                                                                                                                                                          |
| Accumulation OM | ATM Driver Messaging, Plane 2 Messages Count      | This OM measures the number of incoming Plane 2 messages.                                                                                                                                                                                   |
| Accumulation OM | ATM Driver Messaging, Raw Cell Count              | This OM measures the number of raw cells. Raw cells are typically bad cells or OAM cells.                                                                                                                                                   |
| Accumulation OM | ATM Driver Messaging, Raw Message Count           | This OM measures the number of ATM raw messages. Raw messages are messages not assigned to a protocol.                                                                                                                                      |
| Accumulation OM | ATM Driver Messaging, Sequence Number Reset Count | This OM measures the number of times the sequence numbers are reset due to the receipt of five consecutive duplicate cells.                                                                                                                 |
| Accumulation OM | ATM Driver Messaging, SSCOP Message Count         | This OM measures the number of incoming SSCOP messages.                                                                                                                                                                                     |
| Accumulation OM | ATM Link Traffic, Discarded cells with HEC Viol.  | This OM measures the number of ATM cells discarded due to Header Error Control (HEC) violations.                                                                                                                                            |
| Accumulation OM | ATM Link Traffic, Discarded cells with Prot. Errs | This OM measures the number of cells discarded due to Protocol (ATM-Layer Header) Errors.                                                                                                                                                   |
| Accumulation OM | ATM Link Traffic, In NDC-valid cells on HSL VCL   | This OM measures the number of incoming Network Data Collection (NDC) valid cells on the High Speed Links (HSL) VCL.                                                                                                                        |
| Accumulation OM | ATM Link Traffic, Incoming ATM UI cells           | This OM measures the number of incoming ATM User Information (UI) cells.                                                                                                                                                                    |
| Accumulation OM | ATM Link Traffic, OCD Anomalies                   | This OM measures the number of Out of Cell Delineation (OCD) anomalies.                                                                                                                                                                     |

| OM TYPE         | OM TITLE                                                 | OM DESCRIPTION                                                                                                                                                                                                                                           |
|-----------------|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | ATM Link Traffic, Out NDC-valid cells on HSL VCL         | This OM measures the number of outgoing Network Data Collection (NDC) valid cells on the High Speed Links (HSL) VCL.                                                                                                                                     |
| Accumulation OM | ATM Link Traffic, Outgoing ATM UI cells                  | This OM measures the number of outgoing ATM User Information (UI) cells.                                                                                                                                                                                 |
| Accumulation OM | BICC Received Message Counts, BICC Call P Received Count | This OM measures the number of BICC call processing messages received from the SS7 Network.                                                                                                                                                              |
| Accumulation OM | BICC Received Message Counts, BICC Error No OPC Route    | This OM measures the number of BICC messages discarded as a result of not being able to find the associated OPC route for the received BICC message                                                                                                      |
| Accumulation OM | BICC Received Message Counts, BICC Error No Path         | This OM measures the number of BICC messages discarded as a result of not being able to find an inservice path to a given AS.                                                                                                                            |
| Accumulation OM | BICC Received Message Counts, BICC Error No Route        | This OM measures the number of BICC messages discarded as a result of not being able to find a route to a given AS.                                                                                                                                      |
| Accumulation OM | BICC Received Message Counts, BICC Maint Received Count  | This OM measures the number of BICC maintenance messages received from the SS7 Network.                                                                                                                                                                  |
| Accumulation OM | BICC Received Message Counts, Wrong NE Received Count    | This OM measures the number of BICC messages discarded as a result of not receiving the message for a SG Network Element                                                                                                                                 |
| Accumulation OM | Carrier, Far End Line - Errored Seconds                  | This OM measures the Far End Performance data: Far End Errored Seconds - Line.                                                                                                                                                                           |
| Accumulation OM | Carrier, Far End P - Sev Err Frm/AIS Sec                 | This OM measures the Far End Performance data: Far End Severely Errored Frame/AIS Seconds - Path.                                                                                                                                                        |
| Accumulation OM | Carrier, Far End P - Severely Err Secs                   | This OM measures the Far End Performance data: Far End Severely Errored Seconds - Path.                                                                                                                                                                  |
| Accumulation OM | Carrier, Far End P - Unavailable Seconds                 | This OM measures the Far End Performance data: Far End Unavailable Seconds - Path.                                                                                                                                                                       |
| Accumulation OM | Carrier, Far End Path - Code Violations                  | This OM measures the Far End Performance data: Far End Code Violations - Path.                                                                                                                                                                           |
| Accumulation OM | Carrier, Far End Path - Controlled Slips                 | This OM measures the Far End Performance data: Far End Controlled Slips - Path                                                                                                                                                                           |
| Accumulation OM | Carrier, Far End Path - Errored Seconds                  | This OM measures the Far End Performance data: Far End Errored Seconds - Path.                                                                                                                                                                           |
| Accumulation OM | Carrier, Far End Path - Failure Count                    | This OM measures the Far End Performance data: Far End Failure Count - Path.                                                                                                                                                                             |
| Accumulation OM | Carrier, Line - Code Violations                          | This OM measures the Near End Performance data: Code Violations - Line.                                                                                                                                                                                  |
| Accumulation OM | Carrier, Line - Errored Seconds                          | This OM measures the Near End Performance data: Errored Seconds - Line.                                                                                                                                                                                  |
| Accumulation OM | Carrier, Line - Loss of Signal Seconds                   | This OM measures the Near End Performance data: Loss of Signal Seconds - Line. All performance parameters including this parameter are defined in ANSI T1.231-1997 'Digital Hierarchy - Layer 1 in-Service Digital Transmission Performance Monitoring'. |
| Accumulation OM | Carrier, Line - Severely Errored Seconds                 | This OM measures the Near End Performance data: Severely Errored Seconds - Line.                                                                                                                                                                         |



| OM TYPE         | OM TITLE                                                   | OM DESCRIPTION                                                                                                                                                                                                                                                                                                       |
|-----------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Carrier, P - Severely Err Frame/AIS Secs                   | This OM measures the Near End Performance data: Severely Errored Frame/AIS Seconds - Path.                                                                                                                                                                                                                           |
| Accumulation OM | Carrier, Path - AIS Seconds                                | This OM measures the Near End Performance data: AIS Seconds - Path.                                                                                                                                                                                                                                                  |
| Accumulation OM | Carrier, Path - Code Violations                            | This OM measures the Near End Performance data: Code Violations - Path.                                                                                                                                                                                                                                              |
| Accumulation OM | Carrier, Path - Errored Seconds                            | This OM measures the Near End Performance data: Errored Seconds - Path.                                                                                                                                                                                                                                              |
| Accumulation OM | Carrier, Path - Failure Count                              | This OM measures the Near End Performance data: Failure Count - Path.                                                                                                                                                                                                                                                |
| Accumulation OM | Carrier, Path - Severely Errored Seconds                   | This OM measures the Near End Performance data: Severely Errored Seconds - Path.                                                                                                                                                                                                                                     |
| Accumulation OM | Carrier, Path - Unavailable Seconds                        | This OM measures the Near End Performance data: Unavailable Seconds - Path.                                                                                                                                                                                                                                          |
| Accumulation OM | Gateway Screening Results, Disallowed Cld Party Addr Count | This OM measures the number of MSUs rejected on a particular link, because of disallowed SCCP Called Party Addresses.                                                                                                                                                                                                |
| Accumulation OM | Gateway Screening Results, Disallowed ISUP Count           | This OM measures the number of MSUs rejected on a particular link, because of a disallowed ISDN User Part message type.                                                                                                                                                                                              |
| Accumulation OM | Gateway Screening Results, Disallowed Trans Type Count     | This OM measures the number of MSUs rejected on a particular link, because of a disallowed SCCP GTT type.                                                                                                                                                                                                            |
| Accumulation OM | Gateway Screening Results, Invalid Affct Destination Count | This OM measures the number of MSUs rejected on a particular link, because the destination fields in signaling-routeset-test, TFX/TCx, or TFC messages from the MSUs did not pass GWS checking based on the provisioned criteria.                                                                                    |
| Accumulation OM | Gateway Screening Results, Invalid Affct PC-SSN Count      | This OM measures the number of MSUs rejected on a particular link, because the affected PCs in SCCP subsystem-prohibited (SSP) and subsystem-allowed (SSA) messages and an invalid PC or SSN in SCCP subsystem-status-test (SST) messages from the MSUs did not pass GWS checking based on the provisioned criteria. |
| Accumulation OM | Gateway Screening Results, Invalid Cng Party Addr Count    | This OM measures the number of MSUs rejected on a particular link, because the Calling Party Addresses (PC or SSN) from the MSUs did not pass GWS checking based on the provisioned criteria.                                                                                                                        |
| Accumulation OM | Gateway Screening Results, Invalid DPC Count               | This OM measures the number of MSUs rejected on a particular link, because the DPCs from the MSUs did not pass GWS checking based on the provisioned criteria.                                                                                                                                                       |
| Accumulation OM | Gateway Screening Results, Invalid OPC Count               | This OM measures the number of MSUs rejected on a particular link, because the OPCs from the MSUs did not pass GWS checking based on the provisioned criteria.                                                                                                                                                       |
| Accumulation OM | Gateway Screening Results, Invalid SIO Count               | This OM measures the number of MSUs rejected on a particular link, because the SIOs from the MSUs did not pass GWS checking based on the provisioned criteria.                                                                                                                                                       |
| Accumulation OM | GTT Type, GTTs Not Performed Count                         | This OM measures the total number of GTTs that could not be performed for a particular translation type (all reasons).                                                                                                                                                                                               |
| Accumulation OM | GTT Type, GTTs Performed Count                             | This OM measures the total number of MSUs that successfully completed GTT (that is, a match was found for the global title) for a particular translation type.                                                                                                                                                       |

| OM TYPE         | OM TITLE                                          | OM DESCRIPTION                                                                                                                                                                                |
|-----------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | GTT Type, No Translation for Addr Count           | This OM measures the number of times the Address Not Found error was encountered for a particular translation type (that is, there was no match found for the global title in the GTT table). |
| Accumulation OM | ISUP Received Message Counts, ACM Received Count  | This OM measures the number of ISUP Address Complete Messages (ACM) received from the SS7 Network. (Only for SG Identities)                                                                   |
| Accumulation OM | ISUP Received Message Counts, ALT Received Count  | This OM measures the number of ISUP Altering Messages (ALT) received from the SS7 Network. (Only for SG Identities)                                                                           |
| Accumulation OM | ISUP Received Message Counts, ANM Received Count  | This OM measures the number of ISUP Answer Messages (ANM) received from the SS7 Network. (Only for SG Identities)                                                                             |
| Accumulation OM | ISUP Received Message Counts, BLA Received Count  | This OM measures the number of ISUP Blocking Acknowledgement (BLA) received from the SS7 Network. (Only for SG Identities)                                                                    |
| Accumulation OM | ISUP Received Message Counts, BLO Received Count  | This OM measures the number of ISUP Blocking Messages (BLO) received from the SS7 Network. (Only for SG Identities)                                                                           |
| Accumulation OM | ISUP Received Message Counts, CCR Received Count  | This OM measures the number of ISUP Continuity Check Request Messages (CCR) received from the SS7 Network. (Only for SG Identities)                                                           |
| Accumulation OM | ISUP Received Message Counts, CFN Received Count  | This OM measures the number of ISUP Confusion Messages (CFN) received from the SS7 Network. (Only for SG Identities)                                                                          |
| Accumulation OM | ISUP Received Message Counts, CGB Received Count  | This OM measures the number of ISUP Circuit Group Blocking Messages (CGB) received from the SS7 Network. (Only for SG Identities)                                                             |
| Accumulation OM | ISUP Received Message Counts, CGBA Received Count | This OM measures the number of ISUP Circuit Group Blocking Acknowledgement Messages (CGBA) received from the SS7 Network. (Only for SG Identities)                                            |
| Accumulation OM | ISUP Received Message Counts, CGU Received Count  | This OM measures the number of ISUP Circuit Group Unblocking Messages (CGU) received from the SS7 Network. (Only for SG Identities)                                                           |
| Accumulation OM | ISUP Received Message Counts, CGUA Received Count | This OM measures the number of ISUP Circuit Group Unblocking Acknowledgement Messages (CGUA) received from the SS7 Network. (Only for SG Identities)                                          |
| Accumulation OM | ISUP Received Message Counts, CMC Received Count  | This OM measures the number of ISUP Call Modification Completed Messages (CMC) received from the SS7 Network. (Only for SG Identities)                                                        |
| Accumulation OM | ISUP Received Message Counts, CMR Received Count  | This OM measures the number of ISUP Call Modification Request Messages (CMR) received from the SS7 Network. (Only for SG Identities)                                                          |
| Accumulation OM | ISUP Received Message Counts, CMRJ Received Count | This OM measures the number of ISUP Call Modification Rejected Messages (CMRJ) received from the SS7 Network. (Only for SG Identities)                                                        |
| Accumulation OM | ISUP Received Message Counts, CON Received Count  | This OM measures the number of ISUP Connect Messages (CON) received from the SS7 Network. (Only for SG Identities)                                                                            |
| Accumulation OM | ISUP Received Message Counts, COT Received Count  | This OM measures the number of ISUP Continuity Test Messages (COT) received from the SS7 Network. (Only for SG Identities)                                                                    |
| Accumulation OM | ISUP Received Message Counts, CPG Received Count  | This OM measures the number of ISUP Call Progress Messages (CPG) received from the SS7 Network. (Only for SG Identities)                                                                      |

| OM TYPE         | OM TITLE                                          | OM DESCRIPTION                                                                                                                                                  |
|-----------------|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | ISUP Received Message Counts, CQM Received Count  | This OM measures the number of ISUP Circuit Query Messages (CQM) received from the SS7 Network. (Only for SG Identities)                                        |
| Accumulation OM | ISUP Received Message Counts, CQR Received Count  | This OM measures the number of ISUP Circuit Query Response Messages (CQR) received from the SS7 Network. (Only for SG Identities)                               |
| Accumulation OM | ISUP Received Message Counts, CRA Received Count  | This OM measures the number of ISUP Circuit Reservation Acknowledgement Messages (CRA) received from the SS7 Network. (Only for SG Identities)                  |
| Accumulation OM | ISUP Received Message Counts, CRG Received Count  | This OM measures the number of ISUP Charge Information Messages (CRG) received from the SS7 Network. (Only for SG Identities)                                   |
| Accumulation OM | ISUP Received Message Counts, CRM Received Count  | This OM measures the number of ISUP Circuit Reservation Messages (CRM) received from the SS7 Network. (Only for SG Identities)                                  |
| Accumulation OM | ISUP Received Message Counts, CSVr Received Count | This OM measures the number of ISUP Closed User Group Selection and Validation Request Messages (CSVr) received from the SS7 Network. (Only for SG Identities)  |
| Accumulation OM | ISUP Received Message Counts, CSVs Received Count | This OM measures the number of ISUP Closed User Group Selection and Validation Response Messages (CSVs) received from the SS7 Network. (Only for SG Identities) |
| Accumulation OM | ISUP Received Message Counts, CVR Received Count  | This OM measures the number of ISUP Circuit Validation Response Messages (CVR) received from the SS7 Network. (Only for SG Identities)                          |
| Accumulation OM | ISUP Received Message Counts, CVT Received Count  | This OM measures the number of ISUP Circuit Validation Test Messages (CVT) received from the SS7 Network. (Only for SG Identities)                              |
| Accumulation OM | ISUP Received Message Counts, DRS Received Count  | This OM measures the number of ISUP Delayed Release Messages (DRS) received from the SS7 Network. (Only for SG Identities)                                      |
| Accumulation OM | ISUP Received Message Counts, EXM Received Count  | This OM measures the number of ISUP Exit Messages (EXM) received from the SS7 Network. (Only for SG Identities)                                                 |
| Accumulation OM | ISUP Received Message Counts, FAA Received Count  | This OM measures the number of ISUP Facility Accepted Messages (FAA) received from the SS7 Network. (Only for SG Identities)                                    |
| Accumulation OM | ISUP Received Message Counts, FAC Received Count  | This OM measures the number of ISUP Facility Messages (FAC) received from the SS7 Network. (Only for SG Identities)                                             |
| Accumulation OM | ISUP Received Message Counts, FAD Received Count  | This OM measures the number of ISUP Facility Deactivated Messages (FAD) received from the SS7 Network. (Only for SG Identities)                                 |
| Accumulation OM | ISUP Received Message Counts, FAI Received Count  | This OM measures the number of ISUP Facility Information Messages (FAM) received from the SS7 Network. (Only for SG Identities)                                 |
| Accumulation OM | ISUP Received Message Counts, FAR Received Count  | This OM measures the number of ISUP Facility Request Messages (FAR) received from the SS7 Network. (Only for SG Identities)                                     |
| Accumulation OM | ISUP Received Message Counts, FOT Received Count  | This OM measures the number of ISUP Forward Transfer Messages (FOT) received from the SS7 Network. (Only for SG Identities)                                     |

| OM TYPE         | OM TITLE                                                   | OM DESCRIPTION                                                                                                                                        |
|-----------------|------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | ISUP Received Message Counts, FRJ Received Count           | This OM measures the number of ISUP Facility Rejected Messages (FRJ) received from the SS7 Network. (Only for SG Identities)                          |
| Accumulation OM | ISUP Received Message Counts, GRA Received Count           | This OM measures the number of ISUP Circuit Group Reset Acknowledgement Messages (GRA) received from the SS7 Network. (Only for SG Identities)        |
| Accumulation OM | ISUP Received Message Counts, GRS Received Count           | This OM measures the number of ISUP Circuit Group Reset Messages (GRS) received from the SS7 Network. (Only for SG Identities)                        |
| Accumulation OM | ISUP Received Message Counts, IAM Received Count           | This OM measures the number of ISUP Initial Address Message Messages (IAM) received from the SS7 Network. (Only for SG Identities)                    |
| Accumulation OM | ISUP Received Message Counts, IAMN1 Received Count         | This OM measures the number of ISUP Initial Address Message Not Priority One Messages (IAMN1) received from the SS7 Network. (Only for SG Identities) |
| Accumulation OM | ISUP Received Message Counts, IDR Received Count           | This OM measures the number of ISUP Identification Request Messages (IDR) received from the SS7 Network. (Only for SG Identities)                     |
| Accumulation OM | ISUP Received Message Counts, INF Received Count           | This OM measures the number of ISUP Information Messages (INF) received from the SS7 Network. (Only for SG Identities)                                |
| Accumulation OM | ISUP Received Message Counts, INR Received Count           | This OM measures the number of ISUP Information Request Messages (INR) received from the SS7 Network. (Only for SG Identities)                        |
| Accumulation OM | ISUP Received Message Counts, IRS Received Count           | This OM measures the number of ISUP Identification Response Messages (IRS) received from the SS7 Network. (Only for SG Identities)                    |
| Accumulation OM | ISUP Received Message Counts, ISUP Error No AS for OPC/CIC | This OM measures the number of ISUP messages discarded as a result of not being able to find a valid AS for a given OPC/CIC. (Only for SG Identities) |
| Accumulation OM | ISUP Received Message Counts, ISUP Error No OPC/CIC Data   | This OM measures the number of ISUP messages discarded as a result of missing database entry for a given OPC/CIC. (Only for SG Identities)            |
| Accumulation OM | ISUP Received Message Counts, ISUP Error No Path           | This OM measures the number of ISUP messages discarded as a result of not being able to find a path to a given AS. (Only for SG Identities)           |
| Accumulation OM | ISUP Received Message Counts, ISUP Error No Route          | This OM measures the number of ISUP messages discarded as a result of not being able to find a route to a given AS. (Only for SG Identities)          |
| Accumulation OM | ISUP Received Message Counts, ISUP Error Unknown Message   | This OM measures the number of unrecognized ISUP Messages received from the SS7 Network. (Only for SG Identities)                                     |
| Accumulation OM | ISUP Received Message Counts, LOP Received Count           | This OM measures the number of ISUP Loop Prevention Messages (LOP) received from the SS7 Network. (Only for SG Identities)                            |
| Accumulation OM | ISUP Received Message Counts, LPA Received Count           | This OM measures the number of ISUP Loop Back Acknowledgement Messages (LPA) received from the SS7 Network. (Only for SG Identities)                  |
| Accumulation OM | ISUP Received Message Counts, NRM Received Count           | This OM measures the number of ISUP Network Resource Management Messages (NRM) received from the SS7 Network. (Only for SG Identities)                |

| OM TYPE         | OM TITLE                                                     | OM DESCRIPTION                                                                                                                                            |
|-----------------|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | ISUP Received Message Counts, PAM Received Count             | This OM measures the number of ISUP Pass Along Message Messages (PAM) received from the SS7 Network. (Only for SG Identities)                             |
| Accumulation OM | ISUP Received Message Counts, PRG Received Count             | This OM measures the number of ISUP Progress Messages (PRG) received from the SS7 Network. (Only for SG Identities)                                       |
| Accumulation OM | ISUP Received Message Counts, REL Received Count             | This OM measures the number of ISUP Release Messages (REL) received from the SS7 Network. (Only for SG Identities)                                        |
| Accumulation OM | ISUP Received Message Counts, RES Received Count             | This OM measures the number of ISUP Resume Messages (RES) received from the SS7 Network. (Only for SG Identities)                                         |
| Accumulation OM | ISUP Received Message Counts, RLC Received Count             | This OM measures the number of ISUP Release Complete Messages (RLC) received from the SS7 Network. (Only for SG Identities)                               |
| Accumulation OM | ISUP Received Message Counts, RPM Received Count             | This OM measures the number of ISUP Reconfiguration Progress Message Messages (ACM) received from the SS7 Network. (Only for SG Identities)               |
| Accumulation OM | ISUP Received Message Counts, RSC Received Count             | This OM measures the number of ISUP Reset Circuit Messages (RSC) received from the SS7 Network. (Only for SG Identities)                                  |
| Accumulation OM | ISUP Received Message Counts, SAM Received Count             | This OM measures the number of ISUP Subsequent Address Message Messages (SAM) received from the SS7 Network. (Only for SG Identities)                     |
| Accumulation OM | ISUP Received Message Counts, SGM Received Count             | This OM measures the number of ISUP Segmentation Messages (SGM) received from the SS7 Network. (Only for SG Identities)                                   |
| Accumulation OM | ISUP Received Message Counts, SUS Received Count             | This OM measures the number of ISUP Suspend Messages (SUS) received from the SS7 Network. (Only for SG Identities)                                        |
| Accumulation OM | ISUP Received Message Counts, UBA Received Count             | This OM measures the number of ISUP Unblocking Acknowledgement Messages (UBA) received from the SS7 Network. (Only for SG Identities)                     |
| Accumulation OM | ISUP Received Message Counts, UBL Received Count             | This OM measures the number of ISUP Unblocking Messages (UBL) received from the SS7 Network. (Only for SG Identities)                                     |
| Accumulation OM | ISUP Received Message Counts, UCIC Received Count            | This OM measures the number of ISUP Unequipped Circuit Identification Code Messages (UCIC) received from the SS7 Network. (Only for SG Identities)        |
| Accumulation OM | ISUP Received Message Counts, UPA Received Count             | This OM measures the number of ISUP User Part Available Messages (UPA) received from the SS7 Network. (Only for SG Identities)                            |
| Accumulation OM | ISUP Received Message Counts, UPT Received Count             | This OM measures the number of ISUP User Part Test Messages (UPT) received from the SS7 Network. (Only for SG Identities)                                 |
| Accumulation OM | ISUP Received Message Counts, USR Received Count             | This OM measures the number of ISUP User-to-User Information Messages (USR) received from the SS7 Network. (Only for SG Identities)                       |
| Accumulation OM | ISUP Received Message Counts, Wrong NE Received Count        | This OM measures the number of ISUP messages discarded as a result of not receiving the message from a SG Network Element.                                |
| Accumulation OM | Link Faults and Performance, Number of negative ack.received | 1.9 of Q.752 This OM measures number of negative acknowledgements received on the link indicating that the far end did not receive the message correctly. |

| OM TYPE         | OM TITLE                                                       | OM DESCRIPTION                                                                                                                                                                  |
|-----------------|----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Link Faults and Performance, Number of SUs received in error   | 1.8 of Q.752 This OM measures signaling units on a link, received in error.                                                                                                     |
| Accumulation OM | Link Faults and Performance, Octets Retransmitted              | 3.2 of Q.752 This OM counts number of bytes that are retransmitted. This count includes SIO, SIF, opening flags and check bits.                                                 |
| Accumulation OM | Link Faults and Performance, SL alignment or proving failure   | 1.7 of Q.752 This OM measures link synchronization failures during alignment or proving and indicates a signaling data link fault which prevents the SdL moving into service.   |
| Accumulation OM | Link Faults and Performance, SL failure-Abnormal FIBR/BSNR     | 1.3 of Q.752 This OM measures link synchronization failures and indicates complex failures in transmission or an intermittent hardware fault or even designer error.            |
| Accumulation OM | Link Faults and Performance, SL failure-All reasons            | 1.2 of Q.752 This OM measures in-service link failures due to any reason. It does not count link activation failures.                                                           |
| Accumulation OM | Link Faults and Performance, SL failure-Exc. delay of ack      | 1.4 of Q.752 This OM measures link synchronization failures and indicates serious disturbances or an interruption of signaling data link.                                       |
| Accumulation OM | Link Faults and Performance, SL failure-Exc. duration of cong. | 1.6 of Q.752 This OM measures link synchronization failures caused by prolonged congestion on the link.                                                                         |
| Accumulation OM | Link Faults and Performance, SL failure-Excessive error rate   | 1.5 of Q.752 This OM measures link synchronization failures and indicates noisy link.                                                                                           |
| Accumulation OM | Link Faults and Performance, SL failure-Other reasons          | This OM measures link synchronization failures due to reasons other than Abnormal FIBR/BSNR, Excessive delay of ack, Excessive error rate or Excessive duration of congestion . |
| Accumulation OM | Link Management, Changeover Procedure Count                    | This OM measures the number of times the changeover procedure is used to move traffic from a link taken out of service to one or more alternate in-service links.               |
| Accumulation OM | Link Management, Far End Mgmt Inhibit Count                    | This OM measures the number of times a link was successfully inhibited from the far end.                                                                                        |
| Accumulation OM | Link Management, Level 1 Congestion Count                      | This OM measures the number of times a link entered Level 1 congestion from no congestion.                                                                                      |
| Accumulation OM | Link Management, Level 1 Congestion Duration                   | This OM measures the total time, in seconds, a link was in Level 1 congestion.                                                                                                  |
| Accumulation OM | Link Management, Level 2 Congestion Count                      | This OM measures the number of times a link entered Level 2 congestion from Level 1 or no congestion.                                                                           |
| Accumulation OM | Link Management, Level 2 Congestion Duration                   | This OM measures the total time, in seconds, a link was in Level 2 congestion.                                                                                                  |
| Accumulation OM | Link Management, Level 3 Congestion Count                      | This OM measures the number of times a link entered Level 3 congestion from Level 1, Level 2, or no congestion.                                                                 |
| Accumulation OM | Link Management, Level 3 Congestion Duration                   | This OM measures the total time, in seconds, a link was in Level 3 congestion.                                                                                                  |
| Accumulation OM | Link Management, Link Available Duration                       | This OM measures the total time, in seconds, a link was available to MTP Level 3.                                                                                               |
| Accumulation OM | Link Management, Link Deactivated Duration                     | This OM measures the total time, in seconds, a link was manually made unavailable to MTP Level 3 by deactivation.                                                               |
| Accumulation OM | Link Management, Link Local Inhibit Duration                   | This OM measures the total time, in seconds, a link was manually made unavailable to MTP Level 3 by local inhibition.                                                           |

| OM TYPE         | OM TITLE                                           | OM DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Link Management, Link Remote Inhibit Duration      | This OM measures the total time, in seconds, a link was manually made unavailable to MTP Level 3 by remote inhibition.                                                                                                                                                                                                                                                                                             |
| Accumulation OM | Link Management, Near End Forced Unavailable Count | This OM measures the number of times a link was manually made unavailable to MTP Level 3.                                                                                                                                                                                                                                                                                                                          |
| Accumulation OM | Link Management, RPO Count                         | This OM measures the number of times a link became unavailable to MTP Level 3 after the system received SIPO from the far end. This OM is not applicable for SAAL-based High Speed Links.                                                                                                                                                                                                                          |
| Accumulation OM | Link Management, RPO Cumulative Duration           | This OM measures the total time, in seconds, that a link was unavailable to MTP Level 3 after the system received SIPO from the far end. This OM is not applicable for SAAL-based High Speed Links.                                                                                                                                                                                                                |
| Accumulation OM | Link Management, Unavailable Duration              | This OM measures the total time, in seconds, a link was unavailable (automatically or manually made unavailable) to MTP Level 3.                                                                                                                                                                                                                                                                                   |
| Accumulation OM | Link Traffic, MSUs Received Count                  | This OM measures the number of MSUs received on a link, including those MSUs for which retransmission was requested in the SS7 network. For the SAAL-based High Speed Links, the above description applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                  |
| Accumulation OM | Link Traffic, MSUs Requiring GTT Count             | This OM measures the number of incoming MSUs that require GTT, regardless of the outcome of any GWS operation. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                      |
| Accumulation OM | Link Traffic, MSUs Transmitted Count               | This OM measures the number of MSUs transmitted to the far end, including those MSUs that were retransmitted in the SS7 network. For the SAAL-based High Speed Links, the above description applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                         |
| Accumulation OM | Link Traffic, MTP3b Discard Count                  | This OM measures the number of received MTP3B MSUs (> 272 octets) which were discarded because the outgoing link is not MTP3b capable. This OM only applies to MTP3B links since non-MTP3B links are not capable of receiving message > 272 octets.                                                                                                                                                                |
| Accumulation OM | Link Traffic, Network Indicator Discard Count      | This OM measures the number of received MSUs which were discarded due to a mismatch between the MSU's network indicator (NI) and the NI provisioned in this system. The NI may be provisioned on a network appearance basis. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                        |
| Accumulation OM | Link Traffic, Octets Received Count                | This OM measures the total number of octets actually received for all MSUs counted in the MSUs Received Count OM, before the octets are removed in MTP Level 2 processing for the SS7 network. For the MTP2-based links, this count accounts for MTP User Data + MTP L3 Data + MTP L2 Data octets. For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets). |

| OM TYPE         | OM TITLE                                    | OM DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Link Traffic, Octets Requiring GTT Count    | This OM measures the total number of MSU octets received for MSUs requiring GTT, including octets removed in MTP Level 2 processing. For the MTP2-based links, this count applies to MSU octets (MTP User Data + MTP L3 Data + MTP L2 Data octets). For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets).                                                                                                                                         |
| Accumulation OM | Link Traffic, Octets Transmitted Count      | This OM measures the total number of octets actually transmitted for all MSUs counted in the MSUs Transmitted Count OM, including octets added in MTP Level 2 processing for the SS7 network. For the MTP2-based links, this count accounts for MTP User Data + MTP L3 Data + MTP L2 Data octets. For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets).                                                                                           |
| Accumulation OM | Link Traffic, OPC Screening Discard Count   | This OM measures the number of received MSUs which were discarded because the OPC in the MSU matches the pointcode of this system ID or the OPC in the MSU matches the mate's pointcode but the MSU is not received from the C-link. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                         |
| Accumulation OM | Link Traffic, Originated MSU Octets Count   | This OM measures the total number of originated MSU octets (MSU that contains the PC or capability code of this system in the OPC field) transmitted, including those octets that were added in MTP Level 2 processing for the SS7 network. For the MTP2-based links, this count accounts for MTP User Data + MTP L3 Data + MTP L2 Data octets. For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets).                                             |
| Accumulation OM | Link Traffic, Originated MSUs Count         | This OM measures the number of originated MSUs (MSUs that contain the PC or capability code of this system in the OPC field) that are successfully passed to Level 2 for transmission (for example, network management messages and MSUs completing GTT) in the SS7 network. For the MTP2-based links, this count applies to MSU octets (MTP User Data + MTP L3 Data + MTP L2 Data octets). For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets). |
| Accumulation OM | Link Traffic, Pri 0 MSU Inbd Discard Count  | This OM measures the number of priority 0 MSUs discarded by the inbound link due to congestion at levels 1, 2, or 3 in the transmit buffers for the outbound link in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                        |
| Accumulation OM | Link Traffic, Pri 0 MSU Outbd Discard Count | This OM measures the number of priority 0 MSUs discarded due to congestion at levels 1, 2, or 3 in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                                                                                          |
| Accumulation OM | Link Traffic, Pri 1 MSU Inbd Discard Count  | This OM measures the number of priority 1 MSUs discarded by the inbound link due to congestion at levels 2 or 3 in the transmit buffers in the outbound link in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                             |



| OM TYPE         | OM TITLE                                     | OM DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Link Traffic, Pri 1 MSU Outbd Discard Count  | This OM measures the number of priority 1 MSUs discarded due to congestion at levels 2 or 3 in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                                                                     |
| Accumulation OM | Link Traffic, Pri 2 MSU Inbd Discard Count   | This OM measures the number of priority 2 MSUs discarded by the inbound link due to congestion at level 3 in the transmit buffers for the outbound link in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                         |
| Accumulation OM | Link Traffic, Pri 2 MSU Outbd Discard Count  | This OM measures the number of priority 2 MSUs discarded due to level 3 congestion in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                                                                              |
| Accumulation OM | Link Traffic, Pri 3 MSU Inbd Discard Count   | This OM measures the number of priority 3 MSUs discarded by the inbound link due to full transmit buffers for the outbound link in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                                 |
| Accumulation OM | Link Traffic, Pri 3 MSU Outbd Discard Count  | This OM measures the number of priority 3 MSUs discarded due to a full transmit buffer in the SS7 network. For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data) instead of MSUs (MTP User Data + MTP L3 Data + MTP L2 Data).                                                                                                                                                                                                          |
| Accumulation OM | Link Traffic, Terminated MSU Octets Count    | This OM measures the total number of terminated MSU octets (acknowledged, incoming MSU that contains the PC or capability code of this system in the DPC field) received, including octets removed in MTP Level 2 processing for the SS7 network. For the MTP2-based links, this count accounts for MTP User Data + MTP L3 Data + MTP L2 Data octets. For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets).              |
| Accumulation OM | Link Traffic, Terminated MSUs Count          | This OM measures the number of terminated MSUs (acknowledged, incoming MSUs that contain the PC or capability code of this system in the DPC field) received from the SS7 network. For the MTP2-based links, this count applies to MSUs (MTP User Data + MTP L3 Data + MTP L2 Data). For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data).                                                                                            |
| Accumulation OM | Link Traffic, Through-Switched MSUs Count    | This OM measures the number of through-switched MSUs (MSUs that do not contain the PC or capability code of this system in either the OPC or DPC) that are acknowledged, translated, and successfully passed to MTP Level 2 for transmission in the SS7 network. For the MTP2-based links, this count applies to MSUs (MTP User Data + MTP L3 Data + MTP L2 Data). For the SAAL-based High Speed Links, this count applies to Messages (MTP User Data + MTP L3 Data).              |
| Accumulation OM | Link Traffic, Thru-Switched MSU Octets Count | This OM measures the total number of through-switched MSU octets (MSU that does not contain the PC or capability code of this system in either the OPC or DPC) received, including those octets that were added in MTP Level 2 processing for the SS7 network. For the MTP2-based links, this count accounts for MTP User Data + MTP L3 Data + MTP L2 Data octets. For the SAAL-based High Speed Links, this count applies to Message octets (MTP User Data + MTP L3 Data octets). |

| OM TYPE         | OM TITLE                                           | OM DESCRIPTION                                                                                                                                           |
|-----------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Linkset Utilization, Linkset Inactivity Duration   | This OM measures the total time, in seconds, that all links in the linkset were unavailable (automatically or manually made unavailable) to MTP Level 3. |
| Accumulation OM | Linkset Utilization, RST Received Count            | This OM measures the number of restart (RST) messages received.                                                                                          |
| Accumulation OM | Linkset Utilization, RST Transmitted Count         | This OM measures the number of restart (RST) messages transmitted.                                                                                       |
| Accumulation OM | Linkset Utilization, TFA and TCA Received Count    | This OM measures the number of transfer-allowed (TFA) and transfer-cluster-allowed (TCA) messages received.                                              |
| Accumulation OM | Linkset Utilization, TFA and TCA Transmitted Count | This OM measures the number of transfer-allowed (TFA) and transfer-cluster-allowed (TCA) messages transmitted.                                           |
| Accumulation OM | Linkset Utilization, TFC Received Count            | This OM measures the number of transfer-controlled (TFC) messages received by the gateway, listed by the originating network.                            |
| Accumulation OM | Linkset Utilization, TFC Transmitted Count         | This OM measures the number of transfer-controlled (TFC) messages transmitted by the gateway, listed by the destination network.                         |
| Accumulation OM | Linkset Utilization, TFP and TCP Received Count    | This OM measures the number of transfer-prohibited (TFP) and transfer-cluster-prohibited (TCP) messages received.                                        |
| Accumulation OM | Linkset Utilization, TFP and TCP Transmitted Count | This OM measures the number of transfer-prohibited (TFP) and transfer-cluster-prohibited (TCP) messages transmitted.                                     |
| Accumulation OM | Linkset Utilization, TFR and TCR Received Count    | This OM measures the number of transfer-restricted (TFR) and transfer-cluster-restricted (TCR) messages received.                                        |
| Accumulation OM | Linkset Utilization, TFR and TCR Transmitted Count | This OM measures the number of transfer-restricted (TFR) and transfer-cluster-restricted (TCR) messages transmitted.                                     |
| Accumulation OM | Linkset Utilization, UPU Received Count            | This OM measures the number of user part unavailable messages received.                                                                                  |
| Accumulation OM | Log Server, Critical Alarms Ack Count              | This OM measures the number of critical alarms acknowledged by the Log server.                                                                           |
| Accumulation OM | Log Server, Critical Alarms Cleared Count          | This OM measures the number of critical alarms cleared by the Log server.                                                                                |
| Accumulation OM | Log Server, Critical Alarms Received Count         | This OM measures the number of critical alarms received by the Log server.                                                                               |
| Accumulation OM | Log Server, Major Alarms Ack Count                 | This OM measures the number of major alarms acknowledged by the Log server.                                                                              |
| Accumulation OM | Log Server, Major Alarms Cleared Count             | This OM measures the number of major alarms cleared by the Log server.                                                                                   |
| Accumulation OM | Log Server, Major Alarms Received Count            | This OM measures the number of major alarms received by the Log server.                                                                                  |
| Accumulation OM | Log Server, Minor Alarms Ack Count                 | This OM measures the number of minor alarms acknowledged by the Log server.                                                                              |
| Accumulation OM | Log Server, Minor Alarms Cleared Count             | This OM measures the number of minor alarms cleared by the Log server.                                                                                   |
| Accumulation OM | Log Server, Minor Alarms Received Count            | This OM measures the number of minor alarms received by the Log server.                                                                                  |

| OM TYPE         | OM TITLE                                     | OM DESCRIPTION                                                                                                                                                                                                                |
|-----------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | NP Database Totals, Add/Change Updates       | This OM measures the total number of add/change updates received from the LSMS.                                                                                                                                               |
| Accumulation OM | NP Database Totals, Delete Updates           | This OM measures the total number of delete updates received from the LSMS.                                                                                                                                                   |
| Accumulation OM | NP Database Totals, Emergency Updates        | This OM measures the total number of application database updates received from the USP debug facility and can only be displayed from the debug facility Note: Debug is only accessible by Nortel Networks Support Personnel. |
| Accumulation OM | NP Database Totals, Operational Time         | This OM measures the total time within the OM interval that the NPDB was operational.                                                                                                                                         |
| Accumulation OM | NP Database Totals, Retransmitted Updates    | This OM measures the total number of updates retransmitted within the system.                                                                                                                                                 |
| Accumulation OM | NP INAP Totals, INAP CdPN Normalize Failures | This OM measures the number of called party number normalization failures.                                                                                                                                                    |
| Accumulation OM | NP INAP Totals, INAP Indeterminate Queries   | This OM measures the number of INAP indeterminate queries.                                                                                                                                                                    |
| Accumulation OM | NP INAP Totals, INAP Invalid Context         | This OM measures the number of INAP queries with invalid application context.                                                                                                                                                 |
| Accumulation OM | NP INAP Totals, INAP Queries Non-Ported      | This OM measures the number of INAP non ported number queries received.                                                                                                                                                       |
| Accumulation OM | NP INAP Totals, INAP Queries Ported          | This OM measures the number of INAP ported number queries received.                                                                                                                                                           |
| Accumulation OM | NP INAP Totals, INAP Queries Ported Across   | This OM measures the number of INAP ported across number queries received.                                                                                                                                                    |
| Accumulation OM | NP INAP Totals, INAP Queries Ported In       | This OM measures the number of INAP ported in number queries received.                                                                                                                                                        |
| Accumulation OM | NP INAP Totals, INAP Queries Ported Out      | This OM measures the number of INAP ported out number queries received.                                                                                                                                                       |
| Accumulation OM | NP INAP Totals, INAP Queries Unknown         | This OM measures the number of INAP queries received for numbers with unknown ported status.                                                                                                                                  |
| Accumulation OM | NP INAP Totals, INAP Query Failures          | This OM measures the number of INAP query failures.                                                                                                                                                                           |
| Accumulation OM | NP INAP Totals, INAP Query Time Outs         | This OM measures the total number of INAP query time outs.                                                                                                                                                                    |
| Accumulation OM | NP INAP Totals, INAP Total Queries           | This OM measures the total number of INAP queries received.                                                                                                                                                                   |
| Accumulation OM | NP LSSI Totals, MR Query Received            | This OM measures the total number of MR queries received by an application database system node.                                                                                                                              |
| Accumulation OM | NP LSSI Totals, NP Query Received            | This OM measures the total number of NP queries received by an application database system node.                                                                                                                              |
| Accumulation OM | NP NETID Totals, MR Failures                 | This OM measures the total number of MR query failures identified. The MR Failures value is based upon the Network ID of a received SCCP message.                                                                             |
| Accumulation OM | NP NETID Totals, MR GTT Overrides            | This OM measures the total number of MR queries receiving GTT override. The MR GTT Overrides value is based upon the Network ID of a received SCCP message.                                                                   |
| Accumulation OM | NP NETID Totals, MR Loop Detection           | This OM measures the total number of potential looping detections. The MR Loop Detection value is based upon the Network ID of a received SCCP message.                                                                       |

| OM TYPE         | OM TITLE                                      | OM DESCRIPTION                                                                                                                                                                                                                              |
|-----------------|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | NP NETID Totals, MR Non-Ported                | This OM measures the total number of MR queries received for non-ported numbers. The MR Non-Ported value is based upon the Network ID of a received SCCP message.                                                                           |
| Accumulation OM | NP NETID Totals, MR Ported                    | This OM measures the total number of MR queries received for ported numbers. The MR Ported value is based upon the Network ID of a received SCCP message.                                                                                   |
| Accumulation OM | NP NETID Totals, MR Total                     | This OM measures the total number of MR queries received. The MR Total value is based upon the Network ID of a received SCCP message.                                                                                                       |
| Accumulation OM | NP NETID Totals, NP Failures                  | This OM measures the total number of NP query failures. The NP Failures value is based upon the Network ID of a received TCAP message.                                                                                                      |
| Accumulation OM | NP NETID Totals, NP Non-Ported                | This OM measures the total number of NP queries received for non-ported numbers. The NP Non-Ported value is based upon the Network ID in the TCAP message.                                                                                  |
| Accumulation OM | NP NETID Totals, NP Ported                    | This OM measures the total number of NP queries received for ported numbers. The NP Ported value is based upon the Network ID contained in the NETID of a received TCAP message.                                                            |
| Accumulation OM | NP NETID Totals, NP Total                     | This OM measures the total number of NP queries received. The NP Total value is based upon the Network ID of a received TCAP message.                                                                                                       |
| Accumulation OM | NP Service Rule Totals, Service Rule Match    | This OM measures the total number of matches for the Service Rule.                                                                                                                                                                          |
| Accumulation OM | NP Service Rule Totals, Service Rule Mismatch | This OM measures the total number of mismatches for all the Service Rules.                                                                                                                                                                  |
| Accumulation OM | NP Service Totals, Database Mismatches        | This OM measures the total number of Database mismatches. This OM is collected by Service ID.                                                                                                                                               |
| Accumulation OM | NP Service Totals, GTA Normalization Failures | This OM measures the total number of GTA number normalization failures. This OM is collected by Service ID.                                                                                                                                 |
| Accumulation OM | NP Service Totals, GTA Replacement            | This OM measures the total number of service queries receiving GTA replacement. This OM is collected by Service ID.                                                                                                                         |
| Accumulation OM | NP Service Totals, GTT Overrides              | This OM measures the total number of service queries receiving GTT override. This OM is collected by Service ID.                                                                                                                            |
| Accumulation OM | NP Service Totals, RN Check Failures          | This OM measures the total number of RN check failures on incoming messages using the NoA/RN table. This OM is collected by Service ID.                                                                                                     |
| Accumulation OM | NP Service Totals, Service Failures           | This OM measures the total number of Service query failures identified. Service query failures occur when the query logic is unable to process the Service query. This OM is collected by Service ID.                                       |
| Accumulation OM | NP Service Totals, Service Non-Ported         | This OM measures the total number of Service queries received for non-ported numbers. This OM is collected by Service ID.                                                                                                                   |
| Accumulation OM | NP Service Totals, Service Ported             | This OM measures the total number of Service queries received for ported numbers. The Service Ported value is the total of OMR_SERVICE_PORTED_IN, OMR_SERVICE_PORTED_OUT, and OMR_SERVICE_PORTED_ACROSS This OM is collected by Service ID. |

| OM TYPE         | OM TITLE                                       | OM DESCRIPTION                                                                                                                                   |
|-----------------|------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | NP Service Totals, Service Total               | This OM measures the total number of Service queries received. This OM is collected by Service ID.                                               |
| Accumulation OM | NP Service Totals, TT Replacement              | This OM measures the total number of service queries receiving TT replacement. This OM is collected by Service ID.                               |
| Accumulation OM | NP SMI Totals, High Congestion                 | This OM measures the total number of times that the high level congestion state was entered.                                                     |
| Accumulation OM | NP SMI Totals, Login Failures                  | This OM measures the total number of failed LSMS login attempts.                                                                                 |
| Accumulation OM | NP SMI Totals, Low Congestion                  | This OM measures the total number of times that the low level congestion state was entered.                                                      |
| Accumulation OM | NP SMI Totals, Medium Congestion               | This OM measures the total number of times that the medium level congestion state was entered.                                                   |
| Accumulation OM | NP SMI Totals, Messages Invalid                | This OM measures the total number of invalid messages received from the LSMS.                                                                    |
| Accumulation OM | NP SMI Totals, Messages Received               | This OM measures the total number of messages received from the LSMS.                                                                            |
| Accumulation OM | NP SMI Totals, Messages Rejected               | This OM measures the total number of received messages from the LSMS that were rejected.                                                         |
| Accumulation OM | NP SRF Totals, SRF Ind. Routing with Ref. Sub. | This OM measures the number of SRF messages relayed to the subscription network via indirect routing with reference to the subscription network. |
| Accumulation OM | NP SRF Totals, SRF No NP DB Record Found       | This OM measures the number of SRF queries received when no record is found in the NP DB.                                                        |
| Accumulation OM | NP SRF Totals, SRF Queries Non-Ported          | This OM measures the number of SRF non ported number queries received.                                                                           |
| Accumulation OM | NP SRF Totals, SRF Queries Ported Across       | This OM measures the number of SRF ported across number queries received.                                                                        |
| Accumulation OM | NP SRF Totals, SRF Queries Ported In           | This OM measures the number of SRF ported in number queries received.                                                                            |
| Accumulation OM | NP SRF Totals, SRF Queries Ported Out          | This OM measures the number of SRF ported out number queries received.                                                                           |
| Accumulation OM | NP SRF Totals, SRF Queries Unknown             | This OM measures the number of SRF queries received for numbers with unknown ported status.                                                      |
| Accumulation OM | NP SRF Totals, SRF Query Failures              | This OM measures the number of SRF query failures.                                                                                               |
| Accumulation OM | NP SRF Totals, SRF Relayed to HLR              | This OM measures the number of SRF messages relayed to the HLR.                                                                                  |
| Accumulation OM | NP SRF Totals, SRF Successful Messages to MSC  | This OM measures the number of SRF successful messages sent back to the MSC.                                                                     |
| Accumulation OM | NP SRF Totals, SRF Total Queries               | This OM measures the total number of SRF queries received.                                                                                       |
| Accumulation OM | NP SRF Totals, SRF Total Queries Ported        | This OM measures the total number of SRF ported number queries received.                                                                         |
| Accumulation OM | NP SRF Totals, SRF Transaction Errors Sent Out | This OM measures the number of SRF transaction error messages sent out.                                                                          |
| Accumulation OM | NP TnT Totals, TNT Acks Sent                   | This OM measures the number of Tariff non Transparency acknowledgement messages transmitted.                                                     |

| OM TYPE         | OM TITLE                                             | OM DESCRIPTION                                                                                                                                                                                              |
|-----------------|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | NP TnT Totals, TNT Decode Errors                     | This OM measures the number of Tariff non Transparency MAP decode failures due to incorrect parameters that could not be decoded.                                                                           |
| Accumulation OM | NP TnT Totals, TNT Decode Invalid Params             | This OM measures the number of Tariff non Transparency MAP decode failures due to invalid parameters. (i.e. IMSI instead of MSISDN included)                                                                |
| Accumulation OM | NP TnT Totals, TNT No NP DB Rec Found                | This OM measures the number of Tariff non Transparency queries received for numbers not found in the NP DB.                                                                                                 |
| Accumulation OM | NP TnT Totals, TNT Queries Non-Ported                | This OM measures the number of Tariff non Transparency non ported number queries received.                                                                                                                  |
| Accumulation OM | NP TnT Totals, TNT Queries Ported Across             | This OM measures the number of Tariff non Transparency ported across number queries received.                                                                                                               |
| Accumulation OM | NP TnT Totals, TNT Queries Ported In                 | This OM measures the number of Tariff non Transparency ported in number queries received.                                                                                                                   |
| Accumulation OM | NP TnT Totals, TNT Queries Ported Out                | This OM measures the number of Tariff non Transparency ported out number queries received.                                                                                                                  |
| Accumulation OM | NP TnT Totals, TNT Queries Unknown                   | This OM measures the number of Tariff non Transparency queries received for numbers with unknown ported status.                                                                                             |
| Accumulation OM | NP TnT Totals, TNT Query Failures                    | This OM measures the number of Tariff non Transparency query failures during processing.                                                                                                                    |
| Accumulation OM | NP TnT Totals, TNT Total Messages Received           | This OM measures the total number of Tariff non Transparency queries received.                                                                                                                              |
| Accumulation OM | NP TnT Totals, TNT Total Queries Ported              | This OM measures the total number of Tariff non Transparency ported number queries received.                                                                                                                |
| Accumulation OM | NP TnT Totals, TNT Transmission Failures             | This OM measures the number of Tariff non Transparency failures during transmission of Ack.                                                                                                                 |
| Accumulation OM | Route Set Management, RouteSet Congested Count       | This OM measures the number of times, a routeset went into network congestion.                                                                                                                              |
| Accumulation OM | Route Set Management, Routeset Man-busied Count      | This OM measures the number of times a routeset was manually made unavailable.                                                                                                                              |
| Accumulation OM | Route Set Management, Routeset Unavailability Count  | This OM measures the number of times a routeset was unavailable.                                                                                                                                            |
| Accumulation OM | Route Set Management, Routeset Unavailability Dur.   | This OM measures the total time, in seconds, a routeset was unavailable.                                                                                                                                    |
| Accumulation OM | RTC Sanity, RTC12 Passive Audit Count                | This OM hooks into the node maintenance audit, and is pegged on the control shelf CCs, when it does not receive audit request from RTC12 even once. Thus this is a passive audit of RTC                     |
| Accumulation OM | RTC Sanity, RTC15 Passive Audit Count                | This OM hooks into the node maintenance audit, and is pegged on both the control shelf CCs, when it does not receive audit request from RTC15 even once. Thus this is a passive audit of RTC.               |
| Accumulation OM | SAAL Link Management, Cum. Dur. of FE Processor Out. | This OM measures the cumulative duration in seconds during which the use of the link was precluded due to a remote (far-end) processor outage condition, summed across all far-end processor outage events. |

| OM TYPE         | OM TITLE                                              | OM DESCRIPTION                                                                                                                                                                                                                                                       |
|-----------------|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | SAAL Link Management, Cum. Dur. of Lack-of-Credit     | This OM measures the cumulative duration of time in seconds during which SSCOP had PDUs to send to its peer but could not do so because it was not given credit by the far end, summed over all the Lack-of-Credit events occurring during the measurement interval. |
| Accumulation OM | SAAL Link Management, Duration of Link in Service     | This OM measures the number of seconds the link is regarded in service.                                                                                                                                                                                              |
| Accumulation OM | SAAL Link Management, Invalid SSCOP PDUs Rx           | This OM measures the number of Invalid SSCOP PDUs Received.                                                                                                                                                                                                          |
| Accumulation OM | SAAL Link Management, Lack of Credit Events           | This OM measures the number of Lack-of-Credit Events.                                                                                                                                                                                                                |
| Accumulation OM | SAAL Link Management, PDUs Tx Requiring RTx           | This OM measures the number of SSCOP PDUs transmitted that required retransmission because they were not acknowledged by the far-end's SSCOP peer.                                                                                                                   |
| Accumulation OM | SAAL Link Management, Signaling Link Alig. Failures   | This OM measures the number of Signaling Link Alignment Failures.                                                                                                                                                                                                    |
| Accumulation OM | SAAL Link Management, SSCOP Connection Disconnects    | This OM measures the number of SSCOP Connection Disconnects which are characterized by the expiry of Timer_NO_RESPONSE.                                                                                                                                              |
| Accumulation OM | SAAL Link Management, SSCOP Connection Init. Fails    | This OM measures the number of SSCOP Initiation Failures, i.e. the inability to establish an SSCOP Connection.                                                                                                                                                       |
| Accumulation OM | SAAL Link Management, SSCOP Connection Re-est/Resync  | This OM measures the number of SSCOP Re-establishments/Resynchronizations.                                                                                                                                                                                           |
| Accumulation OM | SAAL Link Management, SSCOP Connection Sum-of-Errors  | This OM measures the total number of SSCOP Connection Disconnects, Connection Initiation Failures and Connection Re-establishment/Resynchronization.                                                                                                                 |
| Accumulation OM | SAAL Link Management, SSCOP PDUs Sum-of-Errors        | This OM measures the total number of Unexpected SSCOP PDUs, Invalid SSCOP PDUs and SSCOP PDUs with Other/List Element Errors.                                                                                                                                        |
| Accumulation OM | SAAL Link Management, SSCOP PDUs with List Elem. Errs | This OM measures the number of SSCOP PDUs Received with List Element Errors.                                                                                                                                                                                         |
| Accumulation OM | SAAL Link Management, Unexpected SSCOP PDUs Rx        | This OM measures the number of Unexpected SSCOP PDUs Received.                                                                                                                                                                                                       |
| Accumulation OM | SAAL Link Traffic, PDU Octets RTx                     | This OM measures the number of octets associated with retransmitted SSCOP Sequenced Data PDUs.                                                                                                                                                                       |
| Accumulation OM | SAAL Link Traffic, PDU Octets Rx                      | This OM measures the number of octets associated with SSCOP Sequenced Data PDUs received.                                                                                                                                                                            |
| Accumulation OM | SAAL Link Traffic, PDU Octets Tx                      | This OM measures the number of octets associated with SSCOP Sequenced Data PDUs transmitted, including retransmissions.                                                                                                                                              |
| Accumulation OM | SAAL Link Traffic, PDUs RTx                           | This OM measures the number of SSCOP Sequenced Data PDUs retransmitted.                                                                                                                                                                                              |
| Accumulation OM | SAAL Link Traffic, PDUs Rx                            | This OM measures the number of SSCOP Sequenced Data PDUs received.                                                                                                                                                                                                   |
| Accumulation OM | SAAL Link Traffic, PDUs Tx                            | This OM measures the number of SSCOP Sequenced Data PDUs transmitted including retransmissions.                                                                                                                                                                      |
| Accumulation OM | SAAL Link Traffic, Total PDU Octets Rx                | This OM measures the number of octets associated with received SSCOP PDUs of all types.                                                                                                                                                                              |

| OM TYPE         | OM TITLE                                            | OM DESCRIPTION                                                                                                                                                               |
|-----------------|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | SAAL Link Traffic, Total PDU Octets Tx              | This OM measures the number of octets associated with transmitted SSCOP PDUs of all types which may include Sequenced Data PDU retransmissions.                              |
| Accumulation OM | SAAL Link Traffic, Total PDUs Rx                    | This OM measures the number of SSCOP PDUs of all types received.                                                                                                             |
| Accumulation OM | SAAL Link Traffic, Total PDUs Tx                    | This OM measures the number of transmitted SSCOP PDUs of all types including Sequenced Data PDU retransmissions.                                                             |
| Accumulation OM | SCCP GTT, Alt Routing on Cong Count                 | This OM measures the number of times a message is routed to the backup system because the routeset to the primary system is congested.                                       |
| Accumulation OM | SCCP GTT, GTT Performed Count                       | This OM measures the total number of MSUs that successfully completed GTT (that is, a match was found for the global title). The count is kept across all translation types. |
| Accumulation OM | SCCP GTT, Hop Counter Violation Count               | This OM measures the number of times that a SCCP hop counter violation has occurred.                                                                                         |
| Accumulation OM | SCCP GTT, No Translation for Addr Count             | This OM measures the number of times a match could not be found for the GTA in the translation table. The count is kept across all translation types.                        |
| Accumulation OM | SCCP GTT, Trans Type Not Found Count                | This OM measures the number of times the translation type specified in the MSU was not supported by the USP.                                                                 |
| Accumulation OM | SCCP Local Subsystem, # Msgs for Local SS discarded | This OM measures the number of messages destined to local subsystems that were discarded.                                                                                    |
| Accumulation OM | SCCP Local Subsystem, # Msgs for Local SS UDTSeD    | This OM measures the number of messages destined to local subsystems that receive an error response (UDTS).                                                                  |
| Accumulation OM | SCCP Local Subsystem, Subsystem Activated           | This OM measures the number of times a subsystem has been manually activated.                                                                                                |
| Accumulation OM | SCCP Local Subsystem, Subsystem Allowed             | This OM measures the number of times a subsystem has gone in service (allowed).                                                                                              |
| Accumulation OM | SCCP Local Subsystem, Subsystem Allowed Duration    | This OM measures the total duration that the subsystem was in service (allowed).                                                                                             |
| Accumulation OM | SCCP Local Subsystem, Subsystem Deactivated         | This OM measures the number of times a subsystem has been manually deactivated.                                                                                              |
| Accumulation OM | SCCP Local Subsystem, Subsystem Prohibited          | This OM measures the number of times a subsystem has gone out of service (prohibited). Unit of measure is a 10 second period.                                                |
| Accumulation OM | SCCP Local Subsystem, Subsystem Prohibited Duration | This OM measures the total duration that a subsystem was out of service (prohibited). Unit of measure is a 10 second period.                                                 |
| Accumulation OM | SCCP LSS Instance, SSI Activated                    | This OM measures the number of times a subsystem instance has been manually activated.                                                                                       |
| Accumulation OM | SCCP LSS Instance, SSI Allowed                      | This OM measures the number of times a subsystem instance has gone in service (allowed).                                                                                     |
| Accumulation OM | SCCP LSS Instance, SSI Allowed Duration             | This OM measures the duration that the subsystem instance was in service (allowed). Unit of measure is a 10 second period.                                                   |
| Accumulation OM | SCCP LSS Instance, SSI Application Failure          | This OM measures the number of times a subsystem instance has gone out of service (application failure).                                                                     |



| OM TYPE         | OM TITLE                                           | OM DESCRIPTION                                                                                                                         |
|-----------------|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | SCCP LSS Instance, SSI Congested                   | This OM measures the number of times a subsystem instance has gone into congestion.                                                    |
| Accumulation OM | SCCP LSS Instance, SSI Deactivated                 | This OM measures the number of times a subsystem instance has gone out of service (manually deactivated).                              |
| Accumulation OM | SCCP LSS Instance, SSI Platform Failure            | This OM measures the number of times a subsystem instance has gone out of service (platform failure).                                  |
| Accumulation OM | SCCP LSS Instance, SSI Prohibited Duration         | This OM measures the duration a local subsystem instance has been out of service (prohibited). Unit of measure is a 10 second period.  |
| Accumulation OM | SCCP System Totals, Conn-Orient IP Dist Viol Count | This OM measures the number of IP originated connection-oriented messages that were discarded because they requested SCCP distribution |
| Accumulation OM | SCCP System Totals, Conn-Orient Msg Handled Count  | This OM measures the number of connection- oriented messages that were successfully routed                                             |
| Accumulation OM | SCCP System Totals, Conn-Orient Msg Rtg Fail Count | This OM measures the number of connection- oriented messages that the USP was unable to route                                          |
| Accumulation OM | SCCP System Totals, LUDT Msg Rcvd Count            | This OM measures the number of LUDT messages that the SCCP level received.                                                             |
| Accumulation OM | SCCP System Totals, LUDT Msg Sent Count            | This OM measures the number of LUDT messages that the SCCP level sent.                                                                 |
| Accumulation OM | SCCP System Totals, LUDTS Msg Rcvd Count           | This OM measures the number of LUDTS messages that the SCCP level received.                                                            |
| Accumulation OM | SCCP System Totals, LUDTS Msg Sent Count           | This OM measures the number of LUDTS messages that the SCCP level sent.                                                                |
| Accumulation OM | SCCP System Totals, Msg Incompatibility            | This OM measures the number of times XUDT to UDT conversion fails.                                                                     |
| Accumulation OM | SCCP System Totals, Msg too large for segmentation | This OM measures the number of times segmentation fails due to an over-long message.                                                   |
| Accumulation OM | SCCP System Totals, MSUs Disc-Unrec SCCP Msg Count | This OM measures the number of MSUs discarded because of an unrecognized SCCP message type.                                            |
| Accumulation OM | SCCP System Totals, Out of sequence SCCP msg count | This OM measures the number of times Segments are received out of sequence                                                             |
| Accumulation OM | SCCP System Totals, Reassembly buffer unavailable  | This OM measures the number of times Reassembly resources unavailable occurred                                                         |
| Accumulation OM | SCCP System Totals, Reassembly failed              | This OM measures the number of times Reassembly fails for any non-specified reason.                                                    |
| Accumulation OM | SCCP System Totals, Reassembly Timer Expired       | This OM measures the number of times Reassembly Timer expired                                                                          |
| Accumulation OM | SCCP System Totals, Routing Failure - Unequip.User | This OM measures the number of times SCCP Routing control fails to find a subsystem to route the message.                              |
| Accumulation OM | SCCP System Totals, SCCP Routing Failure Count     | This OM measures the number of messages that SCCP was unable to route.                                                                 |
| Accumulation OM | SCCP System Totals, Segmentation failed            | This OM measures the number of times segmentation fails for any non-specified reason.                                                  |
| Accumulation OM | SCCP System Totals, Segmentation not supported     | This OM measures the number of messages dumped because segmentation is not supported                                                   |

| OM TYPE         | OM TITLE                                                       | OM DESCRIPTION                                                                                                                                                                                                                                                                                                     |
|-----------------|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | SCCP System Totals, SSA Received Count                         | This OM measures the number of subsystem-allowed (SSA) messages received.                                                                                                                                                                                                                                          |
| Accumulation OM | SCCP System Totals, SSA Transmitted Count                      | This OM measures the number of subsystem-allowed (SSA) messages transmitted.                                                                                                                                                                                                                                       |
| Accumulation OM | SCCP System Totals, SSP Received Count                         | This OM measures the number of subsystem-prohibited (SSP) messages received.                                                                                                                                                                                                                                       |
| Accumulation OM | SCCP System Totals, SSP Transmitted Count                      | This OM measures the number of subsystem-prohibited (SSP) messages transmitted.                                                                                                                                                                                                                                    |
| Accumulation OM | SCCP System Totals, SST Received Count                         | This OM measures the number of subsystem-status-test (SST) messages received.                                                                                                                                                                                                                                      |
| Accumulation OM | SCCP System Totals, SST Transmitted Count                      | This OM measures the number of subsystem-status-test (SST) messages transmitted.                                                                                                                                                                                                                                   |
| Accumulation OM | SCCP System Totals, Total messages handled                     | This OM measures all messages processed by SCCP routing control in both incoming and outgoing directions, whether or not the message is processed or delivered successfully. It includes Class 2 and Class 3 connection oriented messages. It does not include Subsystem Status messages such as SSP, SSA, or SST. |
| Accumulation OM | SCCP System Totals, UDT Msg Rcvd Count                         | This OM measures the number of UDT messages that the SCCP level received.                                                                                                                                                                                                                                          |
| Accumulation OM | SCCP System Totals, UDT Msg Sent Count                         | This OM measures the number of UDT messages sent from the SCCP level.                                                                                                                                                                                                                                              |
| Accumulation OM | SCCP System Totals, UDTS Msg Rcvd Count                        | This OM measures the number of UDTS messages that the SCCP level received.                                                                                                                                                                                                                                         |
| Accumulation OM | SCCP System Totals, UDTS Msg Sent Count                        | This OM measures the number of UDTS messages sent from the SCCP level.                                                                                                                                                                                                                                             |
| Accumulation OM | SCCP System Totals, XUDT Msg Rcvd Count                        | This OM measures the number of XUDT messages that the SCCP level received.                                                                                                                                                                                                                                         |
| Accumulation OM | SCCP System Totals, XUDT Msg Sent Count                        | This OM measures the number of XUDT messages sent from the SCCP level.                                                                                                                                                                                                                                             |
| Accumulation OM | SCCP System Totals, XUDTS Hopcounter violation                 | This OM measures the number of MSUs discarded because of Hopcounter violations.                                                                                                                                                                                                                                    |
| Accumulation OM | SCCP System Totals, XUDTS Msg Rcvd Count                       | This OM measures the number of XUDTS messages that the SCCP level received.                                                                                                                                                                                                                                        |
| Accumulation OM | SCCP System Totals, XUDTS Msg Sent Count                       | This OM measures the number of XUDTS messages sent from the SCCP level.                                                                                                                                                                                                                                            |
| Accumulation OM | SCTP Management/Traffic Counts, Association Aborted Count      | This OM measures the number of associations that are aborted by the application, the peer connection or a failure in the network.                                                                                                                                                                                  |
| Accumulation OM | SCTP Management/Traffic Counts, Association Establish Attempts | This OM measures the number of associations which the user or peer SCTP tried to established.                                                                                                                                                                                                                      |
| Accumulation OM | SCTP Management/Traffic Counts, Association Terminated Count   | This OM measures the number of associations that are terminated by the application or the peer connection.                                                                                                                                                                                                         |
| Accumulation OM | SCTP Management/Traffic Counts, Chunk Retransmitted Count      | This OM measures the number of SCTP chunks retransmitted due to SCTP Packets or SCTP Sacks lost in the network. Note: A SCTP packet may contain more than one chunk.                                                                                                                                               |

| OM TYPE         | OM TITLE                                                      | OM DESCRIPTION                                                                                                                                                                                                                |
|-----------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | SCTP Management/Traffic Counts, Chunks Received Count         | This OM measures the number of SCTP chunks received. Note: A SCTP packet may contain more than one chunk.                                                                                                                     |
| Accumulation OM | SCTP Management/Traffic Counts, Chunks Transmitted Count      | This OM measures the number of SCTP chunks transmitted. Note: A SCTP packet may contain more than one chunk.                                                                                                                  |
| Accumulation OM | SCTP Management/Traffic Counts, Established Association Count | This OM measures the number of associations which are in a established state.                                                                                                                                                 |
| Accumulation OM | SCTP Management/Traffic Counts, Out of Blue SCTP Packet       | This OM measures the number of SCTP packets that are received but are not able to identify the association to which they belong.                                                                                              |
| Accumulation OM | SIP Application Service Totals, SIP Call Timeout              | This OM measures the total number of SIP call timeout. This value will be pegged when the SIP transaction stay alive for too long and get cleaned up by the Transaction audit.                                                |
| Accumulation OM | SIP Application Service Totals, SIP message Received          | This OM measures the total number of SIP message received from the Application Server (including all SIP Response msgs)                                                                                                       |
| Accumulation OM | SIP Application Service Totals, SIP message Transmitted       | This OM measures the total number of SIP message transmitted to the Application Server (including all Invite/Notify msgs)                                                                                                     |
| Accumulation OM | SIP Application Service Totals, SIP TCAP Application Timeout  | This OM measures the total number of SIP TCAP application timeout                                                                                                                                                             |
| Accumulation OM | SIP Application Service Totals, TCAP message received         | This OM measures the total number of TCAP orig Or UNI MSUs received for the SIP application on this IP LINK Node.                                                                                                             |
| Accumulation OM | SIP Application Service Totals, TCAP message transmitted      | This OM measures the total number of TCAP Response MSUs received for the SIP application on this IP LINK Node                                                                                                                 |
| Accumulation OM | SLR Database Totals, Add/Change Updates                       | This OM measures the total number of add/change updates received from the HLR provisioning system.                                                                                                                            |
| Accumulation OM | SLR Database Totals, Delete Updates                           | This OM measures the total number of delete updates received from the HLR provisioning system.                                                                                                                                |
| Accumulation OM | SLR Database Totals, Emergency Updates                        | This OM measures the total number of application database updates received from the USP debug facility and can only be displayed from the debug facility Note: Debug is only accessible by Nortel Networks Support Personnel. |
| Accumulation OM | SLR Database Totals, Operational Time                         | This OM measures the total time within the OM interval that the SLRDB was operational.                                                                                                                                        |
| Accumulation OM | SLR Database Totals, Retransmitted Updates                    | This OM measures the total number of updates retransmitted within the BroadBand STP.                                                                                                                                          |
| Accumulation OM | SLR LSSI Totals, Total Failed Queries                         | This OM measures the total number of SLR queries received by an SLR application database system node that failed for any reason across all services and message types.                                                        |
| Accumulation OM | SLR LSSI Totals, Total Queries Received                       | This OM measures the total number of SLR queries received by an SLR application database system node across all services and message types.                                                                                   |
| Accumulation OM | SLR Message Type Totals, IMSI Failed Queries                  | This OM measures the total number of IMSI queries received by an SLR application database system node that failed for any reason.                                                                                             |
| Accumulation OM | SLR Message Type Totals, IMSI Failed SLRDB Lookup             | This OM measures the total number of IMSI queries received by an SLR application database system node that failed in their SLRDB lookup.                                                                                      |

| OM TYPE         | OM TITLE                                                | OM DESCRIPTION                                                                                                                                                                                                    |
|-----------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | SLR Message Type Totals, IMSI Query Received            | This OM measures the total number of IMSI queries received by an SLR application database system node.                                                                                                            |
| Accumulation OM | SLR Message Type Totals, IMSI Successful SLRDB Lookup   | This OM measures the total number of IMSI queries received by an SLR application database system node that succeeded in their SLRDB lookup.                                                                       |
| Accumulation OM | SLR Message Type Totals, MSISDN Failed Queries          | This OM measures the total number of MSISDN queries received by an SLR application database system node that failed for any reason.                                                                               |
| Accumulation OM | SLR Message Type Totals, MSISDN Failed SLRDB Lookup     | This OM measures the total number of MSISDN queries received by an SLR application database system node that failed in their SLRDB lookup.                                                                        |
| Accumulation OM | SLR Message Type Totals, MSISDN Query Received          | This OM measures the total number of MSISDN queries received by an SLR application database system node.                                                                                                          |
| Accumulation OM | SLR Message Type Totals, MSISDN Successful SLRDB Lookup | This OM measures the total number of MSISDN queries received by an SLR application database system node that succeeded in their SLRDB lookup.                                                                     |
| Accumulation OM | SLR SMI Totals, High Congestion                         | This OM measures the total number of times that the high level congestion state was entered.                                                                                                                      |
| Accumulation OM | SLR SMI Totals, Login Failures                          | This OM measures the total number of failed HLR provisioning system login attempts.                                                                                                                               |
| Accumulation OM | SLR SMI Totals, Low Congestion                          | This OM measures the total number of times that the low level congestion state was entered.                                                                                                                       |
| Accumulation OM | SLR SMI Totals, Medium Congestion                       | This OM measures the total number of times that the medium level congestion state was entered.                                                                                                                    |
| Accumulation OM | SLR SMI Totals, Messages Failed Authentication          | This OM measures the total number of received messages from the HLR provisioning system that failed authentication of the retrieved RN against an associated GTT entry with an RN matching the retrieved value.   |
| Accumulation OM | SLR SMI Totals, Messages Invalid                        | This OM measures the total number of invalid messages received from the HLR provisioning system.                                                                                                                  |
| Accumulation OM | SLR SMI Totals, Messages Passed Authentication          | This OM measures the total number of received messages from the HLR provisioning system that successfully authenticated the retrieved RN against an associated GTT entry with an RN matching the retrieved value. |
| Accumulation OM | SLR SMI Totals, Messages Received                       | This OM measures the total number of messages received from the HLR provisioning system.                                                                                                                          |
| Accumulation OM | SLR SMI Totals, Messages Rejected                       | This OM measures the total number of received messages from the HLR provisioning system that were rejected.                                                                                                       |
| Accumulation OM | Special Study Totals, MSUs Received Count               | This OM measures the number of incoming MSUs acknowledged on the specified linkset with the specified OPC/DPC/SIO combination.                                                                                    |
| Accumulation OM | Special Study Totals, MSUs Transmitted Count            | This OM measures the number of outgoing MSUs successfully transmitted to the far end on the specified linkset with the specified OPC/DPC/SIO combination.                                                         |
| Accumulation OM | Special Study Totals, Octets Received Count             | This OM measures the total number of MSU octets received on a specified linkset with the specified OPC/DPC/SIO combination, including the octets removed in MTP Level 2 processing.                               |

| OM TYPE         | OM TITLE                                                   | OM DESCRIPTION                                                                                                                                                                                     |
|-----------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Accumulation OM | Special Study Totals, Octets Transmitted Count             | This OM measures the total number of MSU octets transmitted on the specified linkset with the specified OPC/DPC/SIO combination, including those octets that were added in MTP Level 2 processing. |
| Accumulation OM | System Node State, Disabled, Locked Duration               | This OM measures the number of seconds that a specific RTC, CC, or application system node is disabled and locked.                                                                                 |
| Accumulation OM | System Node State, Disabled, Unlocked Duration             | This OM measures the number of seconds that a specific RTC, CC, or application system node is disabled and unlocked.                                                                               |
| Accumulation OM | System Node State, Enabled, Locked Duration                | This OM measures the number of seconds that a specific RTC, CC, or application system node is enabled and locked.                                                                                  |
| Accumulation OM | System Node State, Enabled, Unlocked Duration              | This OM measures the number of seconds that a specific RTC, CC, or application system node is enabled and unlocked.                                                                                |
| Accumulation OM | System Node State, Locked, Off-line Duration               | This OM measures the number of seconds that a specific RTC, CC, or application system node is locked and off-line.                                                                                 |
| Accumulation OM | System Totals, No Route MSU Discard Count                  | This OM measures the number of MSUs discarded due to routing failure of various causes (for example, an inaccessible DPC).                                                                         |
| Accumulation OM | Task Management, Idle Task Duration                        | This OM measures the number of milliseconds spent in idle time.                                                                                                                                    |
| Accumulation OM | TUP Received Message Counts, B/TUP Error No AS for OPC/CIC | This OM measures the number of TUP messages discarded as a result of not being able to find a valid AS for a given OPC/CIC.                                                                        |
| Accumulation OM | TUP Received Message Counts, B/TUP Error No OPC/CIC Data   | This OM measures the number of TUP and BTUP messages discarded as a result of missing database entry for a given OPC or OPC/CIC.                                                                   |
| Accumulation OM | TUP Received Message Counts, B/TUP Error No Path           | This OM measures the number of TUP and BTUP messages discarded as a result of not being able to find an inservice path to a given AS.                                                              |
| Accumulation OM | TUP Received Message Counts, B/TUP Error No Route          | This OM measures the number of TUP messages discarded as a result of not being able to find a route to a given AS.                                                                                 |
| Accumulation OM | TUP Received Message Counts, BTUP Call P Received Count    | This OM measures the number of BTUP call processing messages received from the SS7 Network.                                                                                                        |
| Accumulation OM | TUP Received Message Counts, BTUP Maint Received Count     | This OM measures the number of BTUP maintenance messages received from the SS7 Network.                                                                                                            |
| Accumulation OM | TUP Received Message Counts, TUP Call P Received Count     | This OM measures the number of TUP call processing messages received from the SS7 Network.                                                                                                         |
| Accumulation OM | TUP Received Message Counts, TUP Maint Received Count      | This OM measures the number of TUP maintenance messages received from the SS7 Network.                                                                                                             |
| Accumulation OM | TUP Received Message Counts, Wrong NE Received Count       | This OM measures the number of TUP messages discarded as a result of not receiving the message for a SG Network Element                                                                            |
| Accumulation OM | UDP, Full Socket Count                                     | This OM measures the number of counts that the udpstat full_socket variable has changed in the om period.                                                                                          |
| Maximum OM      | Link Traffic, Link utilization                             | This OM provides percentage of link utilization. For LSL it is calculated in erlangs while for HSL it is calculated as percentage of processor utilization.                                        |

| OM TYPE    | OM TITLE                                        | OM DESCRIPTION                                                                                                                                                                                                                                             |
|------------|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum OM | NP Database Totals, Max Average Update Rate     | This OM measures the highest update rate (in updates per second) averaged over a 60 second period. ie total updates over the 60 second window divided by 60. If the number of updates received in the 60 second window is less than 60 , the OM will be 0. |
| Maximum OM | NP Transaction Mgmt Totals, TxMgr Percent Used  | This OM measures the maximum percentage of used transactions in the Transaction Management application.                                                                                                                                                    |
| Maximum OM | SLR Database Totals, Max. Update Rate           | This OM measures the highest update rate (in updates per second) during any 60 second period                                                                                                                                                               |
| No Action  | System Node State, Percentage Enabled           | This OM measures the percentage of time that a specific RTC, CC, or application system node is enabled, or busy (for the Processor Utilization OM, GR-82-CORE section 6.4.5, item 10). The value for this OM ranges from 0 to 100 percent.                 |
| No Action  | Task Management, Collection Period Duration     | This OM measures the total number of milliseconds for an OM collection period. This OM can be used to calculate the percentage of use for all the other Task Management OMs.                                                                               |
| No action  | Task Management, Level 0 Priority Task Duration | This OM measures the number of milliseconds spent in Level 0 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 1 Priority Task Duration | This OM measures the number of milliseconds spent in Level 1 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 2 Priority Task Duration | This OM measures the number of milliseconds spent in Level 2 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 3 Priority Task Duration | This OM measures the number of milliseconds spent in Level 3 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 4 Priority Task Duration | This OM measures the number of milliseconds spent in Level 4 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 5 Priority Task Duration | This OM measures the number of milliseconds spent in Level 5 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 6 Priority Task Duration | This OM measures the number of milliseconds spent in Level 6 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 7 Priority Task Duration | This OM measures the number of milliseconds spent in Level 7 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 8 Priority Task Duration | This OM measures the number of milliseconds spent in Level 8 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, Level 9 Priority Task Duration | This OM measures the number of milliseconds spent in Level 9 priority task(s).                                                                                                                                                                             |
| No Action  | Task Management, OS System Tasks Duration       | This OM measures the number of milliseconds spent in VxWorks OS tasks.                                                                                                                                                                                     |

|                        |  |  |  |  |
|------------------------|--|--|--|--|
|                        |  |  |  |  |
| New or changed in SN08 |  |  |  |  |
|                        |  |  |  |  |

## Appendix E: MG9000 Reported Alarms and Logs

| Fault Subsystem (MIB)                     | Alarm Id | Fault Type            | Severity                      | Description                                                                                                                                                                                                             |
|-------------------------------------------|----------|-----------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                           |          |                       |                               |                                                                                                                                                                                                                         |
|                                           | CES305   | cesLossOfCell         | Major                         | Loss of Cells                                                                                                                                                                                                           |
| norCarrFault<br>(NORTEL-UEMG-CARRIER-MIB) | MGCA301  | los                   | DS1 - Minor<br>OC3 - Critical | lossOfSignal                                                                                                                                                                                                            |
|                                           | MGCA302  | ais                   | DS1 - Minor<br>OC3 - Critical | alarm indication signal                                                                                                                                                                                                 |
|                                           | MGCA303  | lof                   | DS1 - Minor<br>OC3 - Critical | lossOfFrame                                                                                                                                                                                                             |
|                                           | MGCA304  | rai                   | DS1 - Minor                   | remote alarm indication                                                                                                                                                                                                 |
|                                           | MGCA305  | bersf                 | OC3 - Critical                | bitErrorRate S F...                                                                                                                                                                                                     |
|                                           | MGCA306  | bersd                 | OC3 - Major                   | bitErrorRate SigDegrade                                                                                                                                                                                                 |
|                                           | MGCA307  | rdi                   | OC3 - Minor                   | remote defect indication                                                                                                                                                                                                |
|                                           | MGCA308  | plm                   | OC3 - Minor                   | path label mismatch                                                                                                                                                                                                     |
|                                           | MGCA309  | lop                   | OC3 - Minor                   | loss of Pointer                                                                                                                                                                                                         |
|                                           | MGCA310  | uneq                  | OC3 - Minor                   | unequipped                                                                                                                                                                                                              |
|                                           | MGCA312  | imaLinkLif            | Minor                         | IMA link- Loss of IMA Frame                                                                                                                                                                                             |
|                                           | MGCA313  | imaLinkLods           | Minor                         | IMA link- Loss of delayed synchronization                                                                                                                                                                               |
|                                           | MGCA314  | imaLinkRfi            | Minor                         | IMA link- Remote failure indication                                                                                                                                                                                     |
|                                           | MGCA315  | imaLinkTxMisConnect   | Minor                         | IMA link Transmit misconnect                                                                                                                                                                                            |
|                                           | MGCA316  | imaLinkRxMisConnect   | Minor                         | IMA link receive misconnect                                                                                                                                                                                             |
|                                           | MGCA317  | imaLinkTxFault        | Minor                         | IMA link transmit fault                                                                                                                                                                                                 |
|                                           | MGCA318  | imaLinkRxFault        | Minor                         | IMA link receive fault                                                                                                                                                                                                  |
|                                           | MGCA319  | imaLinkTxUnusableFe   | Minor                         | IMA link transmit unusable far end                                                                                                                                                                                      |
|                                           | MGCA320  | imaLinkRxUnusableFe   | Minor                         | IMA link receive unusable far end                                                                                                                                                                                       |
|                                           | MGCA321  | imaGroupStartupFe     | Major                         | IMA group startup far end                                                                                                                                                                                               |
|                                           | MGCA322  | imaGroupCfgAbort      | Critical                      | IMA group configuration abort                                                                                                                                                                                           |
|                                           | MGCA323  | imaGroupCfgAbortFe    | Major                         | IMA group configuration abort far end                                                                                                                                                                                   |
|                                           | MGCA324  | imaGroupInsuffLinks   | Critical                      | IMA group insufficient links                                                                                                                                                                                            |
|                                           | MGCA325  | imaGroupInsuffLinksFe | Major                         | IMA group insufficient links far end                                                                                                                                                                                    |
|                                           | MGCA326  | imaGroupBlockedFe     | Minor                         | IMA group blocked far end                                                                                                                                                                                               |
|                                           | MGCA327  | imaGroupTimingSynch   | Major                         | IMA group timing synchronization                                                                                                                                                                                        |
|                                           | MGCA328  | abiLossOfClock        | Critical                      | ABI Loss of Clock on DS512 optical link                                                                                                                                                                                 |
|                                           | MGCA329  | abiLossOfFrame        | Critical                      | ABI Loss of Frame on DS512 optical link                                                                                                                                                                                 |
|                                           | MGCA330  | abiLowLightLevel      | Critical                      | ABI Loss of Signal (low light level) on DS512 optical link                                                                                                                                                              |
|                                           | MGCA331  | abiChannelParityError | Minor                         | ABI Channel parity error on DS512 optical link                                                                                                                                                                          |
|                                           | MGCA332  | tim                   | Minor                         | SDH Path Trace Identifier Mismatch Alarm (only applies to SDH and not SONET). The Path Trace Identifier being seen by the OC3 card at the carrier Path level does not match what has been provisioned for that carrier. |
|                                           | MGCA333  | ds3Ais                |                               | DS3 - Alarm Indication Signal - Check far-end carrier faults                                                                                                                                                            |
|                                           | MGCA334  | ds3Lof                |                               | DS3 - Loss Of Frame                                                                                                                                                                                                     |
|                                           | MGCA335  | ds3Rai                |                               | DS3 - Remote Indication Signal - Check far-end carrier faults                                                                                                                                                           |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |                         |               |                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------------------------|---------------|----------------------------------------------|
| <b>SCC2 LOG Output Example</b><br>*C01 MGCA330 0746 TBL MG9K NorCarrFault<br>Location: 1-RM9K-Frame000.Shelf1.Slot06.Port00<br>Notification Id: 824<br>State: not acknowledged<br>Category: Communication Alarm<br>Cause: Loss Of Signal<br>Time: Apr 24 14:01:11 2003<br>Component Id: Port.frame0.shelf1.slot6.Abl.abi<br>Specific Problem: NorCarrFault - Abl loss of signal<br>Description: Loss Of Signal (i.e., Low Light Level) on DS512 Optical Link<br>Site Flr RPos Bay_id<br>FFFF FF FFF FFFF FFF                            |                |                         |               |                                              |
| <b>NTSTD LOG Output Example</b><br>MSH10_I06BE *** MGCA330 APR24 14:01:11 0746 TBL MG9K NorCarrFault<br>Location: 1-RM9K-Frame000.Shelf1.Slot06.Port00<br>Notification Id: 824<br>State: not acknowledged<br>Category: Communication Alarm<br>Cause: Loss Of Signal<br>Time: Apr 24 14:01:11 2003<br>Component Id: Port.frame0.shelf1.slot6.Abl.abi<br>Specific Problem: NorCarrFault - Abl loss of signal<br>Description: Loss Of Signal (i.e., Low Light Level) on DS512 Optical Link<br>Site Flr RPos Bay_id<br>FFFF FF FFF FFFF FFF |                |                         |               |                                              |
| <b>nnAtmFaultType<br/>(NORTEL-UEMG-ATM-MIB)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>VC301</b>   | vclTpAis                | Minor         | atmVcl Alarm indication signal               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>VC302</b>   | vclTpRdi                | Minor         | atmVcl Remote Detection Indicator            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>VC303</b>   | vclLoc                  | Minor         | loss of continuity, vcl                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>VC304</b>   | vccTpAis                | Minor         | atmVcc Alarm indication signal               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>VC305</b>   | vccTpRdi                | Minor         | atmVcc Remote Detection Indicator            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>VC306</b>   | vccLoc                  | Minor         | loss of continuity, vcc                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF301</b> | shelfTalkBatteryA       | Critical      | SIC Talk Battery A                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF302</b> | shelfTalkBatteryB       | Critical      | SIC Talk Battery B                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF303</b> | shelfSignalBatteryA     | Major         | SIC Signal Battery A                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF304</b> | shelfSignalBatteryB     | Major         | SIC Signal Battery B                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF305</b> | shelfSignalBatteryAfuse | Major         | SIC Signal Battery A Fuse                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF306</b> | shelfSignalBatteryBfuse | Major         | SIC Signal Battery B Fuse                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF307</b> | shelfFailLED            | Indeterminate | SIC Shelf Fail LED                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF308</b> | bipSignalBatteryA1      | Major         | BIP Signal Battery A1                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF309</b> | bipSignalBatteryA2      | Major         | BIP Signal Battery A2                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF310</b> | bipSignalBatteryB1      | Major         | BIP Signal Battery B1                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF311</b> | bipSignalBatteryB2      | Major         | BIP Signal Battery B2                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF312</b> | bipTalkBatteryA         | Minor         | BIP Talk Battery A                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF313</b> | bipTalkBatteryB         | Minor         | BIP Talk Battery B                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF314</b> | bipFilterA              | Minor         | BIP Filter A Fail                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF315</b> | bipFilterB              | Minor         | BIP Filter B Fail                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF316</b> | bipScanPoint1           | Indeterminate | BIP Scan Point 1                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF317</b> | bipScanPoint2           | Indeterminate | BIP Scan Point 2                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF318</b> | bipScanPoint3           | Indeterminate | BIP Scan Point 3                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF319</b> | bipScanPoint4           | Indeterminate | BIP Scan Point 4                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF320</b> | bipScanPoint5           | Indeterminate | BIP Scan Point 5                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF321</b> | bipScanPoint6           | Indeterminate | BIP Scan Point 6                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF322</b> | bipScanPoint7           | Indeterminate | BIP Scan Point 7                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF323</b> | bipScanPoint8           | Indeterminate | BIP Scan Point 8                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF324</b> | bipScanPoint9           | Indeterminate | BIP Scan Point 9                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF325</b> | bipScanPoint10          | Indeterminate | BIP Scan Point 10                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF326</b> | bipScanPoint11          | Indeterminate | BIP Scan Point 11                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF327</b> | bipTalkBatteryA1        | Major         | Talk Battery A1 Power Feed                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF328</b> | bipTalkBatteryA2        | Major         | Talk Battery A Power Feed                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF329</b> | bipTalkBatteryB1        | Major         | Talk Battery B1 Power Feed                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF330</b> | bipTalkBatteryB2        | Major         | Talk Battery B2 Power Feed                   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF332</b> | bipEcuTemp0             | Minor         | BIP Environmental Control Unit 0 Temperature |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF333</b> | bipEcuTemp1             | Minor         | BIP Environmental Control Unit 1 Temperature |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF334</b> | bipEcuFan0              | Minor         | BIP Environmental Control Unit 0 Fan         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF335</b> | bipEcuFan1              | Minor         | BIP Environmental Control Unit 1 Fan         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF336</b> | bipRemoteAlarmcutoff    | Indeterminate | BIP Remote Alarm Cut Off                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF337</b> | bipLocalAlarmcutoff     | Indeterminate | BIP Local Alarm Cut Off                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF338</b> | bipAbsFusefail          | Major         | BIP ABS Fuse Fail                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF339</b> | bipAbsPowerSupply       | Critical      | BIP ABS Battery Power Supply                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF340</b> | bipShfBreakerTrip       | Major         | BIP Shelf Circuit Breaker Trip               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <b>SHLF341</b> | bipCsApresence          | Major         | Presence of BIP's Current-Sense Card A       |



|                                             |                |                        |               |                                                                   |
|---------------------------------------------|----------------|------------------------|---------------|-------------------------------------------------------------------|
| <b>nnShfFault<br/>(NORTEL-UEMG-SHF-MIB)</b> | <b>SHLF342</b> | bipCsBpresence         | Major         | Presence of BIP's Current-Sense Card B                            |
|                                             | <b>SHLF343</b> | bipAlmRelayPresence    | Major         | Presence of BIP's Alarm Relay Card                                |
|                                             | <b>SHLF344</b> | bipCSAshf0HighThres    | Minor         | Current-Sense Card A Shelf 0 High Threshold exceeded              |
|                                             | <b>SHLF345</b> | bipCSAshf1HighThres    | Minor         | Current-Sense Card A Shelf 1 High Threshold exceeded              |
|                                             | <b>SHLF346</b> | bipCSAshf2HighThres    | Minor         | Current-Sense Card A Shelf 2 High Threshold exceeded              |
|                                             | <b>SHLF347</b> | bipCSAshf3HighThres    | Minor         | Current-Sense Card A Shelf 3 High Threshold exceeded              |
|                                             | <b>SHLF348</b> | bipCSBshf0HighThres    | Minor         | Current-Sense Card B Shelf 0 High Threshold exceeded              |
|                                             | <b>SHLF349</b> | bipCSBshf1HighThres    | Minor         | Current-Sense Card B Shelf 1 High Threshold exceeded              |
|                                             | <b>SHLF350</b> | bipCSBshf2HighThres    | Minor         | Current-Sense Card B Shelf 2 High Threshold exceeded              |
|                                             | <b>SHLF351</b> | bipCSBshf3HighThres    | Minor         | Current-Sense Card B Shelf 3 High Threshold exceeded              |
|                                             | <b>SHLF352</b> | bipTempHighThres       | Minor         | Current High Temperature Threshold exceeded                       |
|                                             | <b>SHLF353</b> | bipCSAshf0LowThres     | Minor         | Current-Sense Card A Shelf 0 Low Threshold exceeded               |
|                                             | <b>SHLF354</b> | bipCSAshf1LowThres     | Minor         | Current-Sense Card A Shelf 1 Low Threshold exceeded               |
|                                             | <b>SHLF355</b> | bipCSAshf2LowThres     | Minor         | Current-Sense Card A Shelf 2 Low Threshold exceeded               |
|                                             | <b>SHLF356</b> | bipCSAshf3LowThres     | Minor         | Current-Sense Card A Shelf 3 Low Threshold exceeded               |
|                                             | <b>SHLF357</b> | bipCSBshf0LowThres     | Minor         | Current-Sense Card B Shelf 0 Low Threshold exceeded               |
|                                             | <b>SHLF358</b> | bipCSBshf1LowThres     | Minor         | Current-Sense Card B Shelf 1 Low Threshold exceeded               |
|                                             | <b>SHLF359</b> | bipCSBshf2LowThres     | Minor         | Current-Sense Card B Shelf 2 Low Threshold exceeded               |
|                                             | <b>SHLF360</b> | bipCSBshf3LowThres     | Minor         | Current-Sense Card B Shelf 3 Low Threshold exceeded               |
|                                             | <b>SHLF361</b> | bipTempLowThres        | Minor         | Current Low Temperature Threshold exceeded                        |
|                                             | <b>SHLF362</b> | bipSignalBatteryFuse   | Major         | Status of the Signal Battery Fuse                                 |
|                                             | <b>SHLF363</b> | bipTalkBatteryAFuse    | Major         | Status of Talk Battery A Fuse                                     |
|                                             | <b>SHLF364</b> | bipTalkBatteryBFuse    | Major         | Status of Talk Battery B Fuse                                     |
|                                             | <b>SHLF365</b> | bipEcuFuse0            | Minor         | Status of Cooling Unit 0 Fuse                                     |
|                                             | <b>SHLF366</b> | bipEcuFuse1            | Minor         | Status of Cooling Unit 1 Fuse                                     |
|                                             | <b>SHLF367</b> | bipEndAisleFuse        | Minor         | Status of the End-Aisle Fuse                                      |
|                                             | <b>SHLF368</b> | bipSignalDistribution1 | Indeterminate | BIP Signal Distribution Point 1                                   |
|                                             | <b>SHLF369</b> | bipSignalDistribution2 | Indeterminate | BIP Signal Distribution Point 2                                   |
|                                             | <b>SHLF370</b> | bipSignalDistribution3 | Indeterminate | BIP Signal Distribution Point 3                                   |
|                                             | <b>SHLF371</b> | bipSignalDistribution4 | Indeterminate | BIP Signal Distribution Point 4                                   |
|                                             | <b>SHLF372</b> | bipVisualCritical      | Indeterminate | BIP Visual Critical                                               |
|                                             | <b>SHLF373</b> | bipVisualMajor         | Indeterminate | BIP Visual Major                                                  |
|                                             | <b>SHLF374</b> | bipVisualMinor         | Indeterminate | BIP Visual Minor                                                  |
|                                             | <b>SHLF375</b> | bipAudibleCritical     | Indeterminate | BIP Audible Critical                                              |
|                                             | <b>SHLF376</b> | bipAudibleMajor        | Indeterminate | BIP Audible Major                                                 |
|                                             | <b>SHLF377</b> | bipAudibleMinor        | Indeterminate | BIP Audible Minor                                                 |
|                                             | <b>SHLF378</b> | bipAlarmCutOffLED      | Indeterminate | BIP Alarm CutOff LED                                              |
|                                             | <b>SHLF379</b> | bipTalkBatteryFailALEd | Indeterminate | BIP Talk Battery A Fail LED                                       |
|                                             | <b>SHLF380</b> | bipTalkBatteryFailBLEd | Indeterminate | BIP Talk Battery B Fail LED                                       |
|                                             | <b>SHLF381</b> | bipCriticalLEDbank     | Indeterminate | BIP Critical LED Bank                                             |
|                                             | <b>SHLF382</b> | bipMajorLEDbank        | Indeterminate | BIP Major LED Bank                                                |
|                                             | <b>SHLF383</b> | bipMinorLEDbank        | Indeterminate | BIP Minor LED Bank                                                |
|                                             | <b>SHLF384</b> | bipEcu1LED             | Indeterminate | BIP Environmental Control Unit 0 LED                              |
|                                             | <b>SHLF385</b> | bipEcu2LED             | Indeterminate | BIP Environmental Control Unit 1 LED                              |
|                                             | <b>SHLF386</b> | bipAlarmFailLED        | Indeterminate | BIP Alarm Processor Card Fail LED                                 |
|                                             | <b>SHLF387</b> | bipAisleAlarm          | Indeterminate | BIP Aisle Alarm                                                   |
|                                             | <b>SHLF388</b> | bipFrameFail           | Indeterminate | BIP Frame Fail                                                    |
|                                             | <b>SHLF389</b> | bipAlmRelayLed         | Indeterminate | Presence of BIP's Alarm Relay Card LED                            |
|                                             | <b>SHLF390</b> | bipCsAled              | Indeterminate | Status of Current-Sense Card A LED                                |
|                                             | <b>SHLF391</b> | bipCsBled              | Indeterminate | Status of Current-Sense Card B LED                                |
|                                             | <b>SHLF392</b> | shelfCompatibility     |               | This log is generated when a shelfCompatibility fault is received |
|                                             |                | cardDiscovery          |               | This log is generated when a cardDiscovery fault is received      |
|                                             |                | cardDiscPowIo          |               | This log is generated when a cardDiscPowIo fault is received      |
|                                             |                | cardDiscPowSic         |               | This log is generated when a cardDiscPowSic fault is received     |

|                                            |         |                      |          |                                                                                                      |
|--------------------------------------------|---------|----------------------|----------|------------------------------------------------------------------------------------------------------|
|                                            | SHLF393 | cardDiscSlot02       |          | This log is generated when a cardDiscSlot2 fault is received                                         |
|                                            |         | cardDiscSlot03       |          | This log is generated when a cardDiscSlot3 fault is received                                         |
|                                            |         | cardDiscSlot04       |          | This log is generated when a cardDiscSlot4 fault is received                                         |
|                                            |         | cardDiscSlot05       |          | This log is generated when a cardDiscSlot5 fault is received                                         |
|                                            |         | cardDiscSlot06       |          | This log is generated when a cardDiscSlot6 fault is received                                         |
|                                            |         | cardDiscSlot07       |          | This log is generated when a cardDiscSlot7 fault is received                                         |
|                                            |         | cardDiscSlot08       |          | This log is generated when a cardDiscSlot8 fault is received                                         |
|                                            |         | cardDiscSlot09       |          | This log is generated when a cardDiscSlot9 fault is received                                         |
|                                            |         | cardDiscSlot10       |          | This log is generated when a cardDiscSlot10 fault is received                                        |
|                                            |         | cardDiscSlot11       |          | This log is generated when a cardDiscSlot11 fault is received                                        |
|                                            |         | cardDiscSlot12       |          | This log is generated when a cardDiscSlot12 fault is received                                        |
|                                            |         | cardDiscSlot13       |          | This log is generated when a cardDiscSlot13 fault is received                                        |
|                                            |         | cardDiscSlot14       |          | This log is generated when a cardDiscSlot14 fault is received                                        |
|                                            |         | cardDiscSlot15       |          | This log is generated when a cardDiscSlot15 fault is received                                        |
|                                            |         | cardDiscSlot16       |          | This log is generated when a cardDiscSlot16 fault is received                                        |
|                                            |         | cardDiscSlot17       |          | This log is generated when a cardDiscSlot17 fault is received                                        |
|                                            |         | cardDiscSlot18       |          | This log is generated when a cardDiscSlot18 fault is received                                        |
|                                            |         | cardDiscSlot19       |          | This log is generated when a cardDiscSlot19 fault is received                                        |
|                                            |         | cardDiscSlot20       |          | This log is generated when a cardDiscSlot20 fault is received                                        |
|                                            |         | cardDiscSlot21       |          | This log is generated when a cardDiscSlot21 fault is received                                        |
| norLineFault<br>(NORTEL-UEMG-<br>LINE-MIB) | SWLN301 | lineFault            | Minor    | Line in Fault                                                                                        |
|                                            | SWLN302 | lineProtectionFault  | Minor    | Hazardous Voltage                                                                                    |
|                                            | SWLN303 | lineBabbleState      | Minor    | Line in Babbling state                                                                               |
| nnDslFault<br>(NORTEL-UEMG-<br>DSL-MIB)    | XDSL301 | losATUC              | Minor    | Loss of signal - Local modem                                                                         |
|                                            | XDSL302 | lofATUC              | Minor    | Loss of frame - Local modem                                                                          |
|                                            | XDSL303 | lprATUC              | Critical | Loss of Power - Local modem                                                                          |
|                                            | XDSL304 | lolATUC              | Minor    | Loss of link - Local modem                                                                           |
|                                            | XDSL305 | losATUR              | Minor    | Loss of signal - Remote modem                                                                        |
|                                            | XDSL306 | lofATUR              | Minor    | Loss of frame - Remote modem                                                                         |
|                                            | XDSL307 | lprATUR              | Minor    | Loss of power - Remote modem                                                                         |
|                                            | XDSL308 | lolATUR              | Minor    | Loss of link - Remote modem                                                                          |
|                                            | XDSL309 | aturNotPresent       | Minor    | No remote modem present                                                                              |
|                                            | XDSL310 | noClock              | Critical | Local modem clock failure                                                                            |
|                                            | XDSL311 | handshakeFail        | Critical | Protocol error                                                                                       |
|                                            | XDSL312 | linkMismatch         | Critical | Configuration error                                                                                  |
|                                            | XDSL313 | vpiNonzero           | Critical | ATM traffic dropped at WAC - upstream                                                                |
|                                            | XDSL314 | lclATUC              | Critical | Loss of sync of ATM cells - upstream                                                                 |
|                                            | XDSL315 | lclATUR              | Critical | Loss of sync of ATM cells - downstream                                                               |
|                                            | XDSL316 | failATUC             | Critical | Local modem critical failure - not responding, in Kernel mode, download failure or message corrupted |
|                                            | XDSL317 | circuitHardwareFault | Critical | General H/W fault indication - circuit                                                               |

|                                                       |               |                            |          |                                                                                                                                                                                                                                                               |
|-------------------------------------------------------|---------------|----------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>BWSelfFault<br/>(NORTEL-UEMG-BANDWIDTH-MIB)</b>    | <b>BW300</b>  | bwResBandwShelfFault       | Warning  | Reserved bandwidth used on the indicated shelf has exceeded the Bandwidth Congestion Threshold                                                                                                                                                                |
| <b>BandwidthFault<br/>(NORTEL-UEMG-BANDWIDTH-MIB)</b> | <b>BW301</b>  | bwResBandwTotalFault       | Warning  | This alarm is generated when reserved bandwidth use on the network interface has exceeded the Bandwidth Congestion Threshold. The alarm is cleared when reserved bandwidth on the network interface is 10% less than the threshold.                           |
|                                                       | <b>BW302</b>  | bwResBandwSloaFault        | Warning  | This alarm is generated when reserved bandwidth dedicated to switched lines connections on the network interface has exceeded the Bandwidth Congestion Threshold with respect to the amount of bandwidth configured the network interface for switched lines. |
|                                                       | <b>BW304</b>  | bwSwitchFabricTotalFault   | Warning  | Overall Cell Queue Congestion Alarm. Overall atm cell queue is at least 90% full.                                                                                                                                                                             |
|                                                       | <b>BW305</b>  | bwSwitchFabricCbrFault     | Warning  | CBR Cell Queue Congestion Alarm. Atm cell queue for this service type is at least 90% full.                                                                                                                                                                   |
|                                                       | <b>BW306</b>  | bwSwitchFabricRtVbrFault   | Warning  | RT-VBR Cell Queue Congestion Alarm. Atm cell queue for this service type is at least 90% full.                                                                                                                                                                |
|                                                       | <b>BW307</b>  | bwSwitchFabricNrtVbrFault  | Warning  | NRT-VBR Cell Queue Congestion Alarm. Atm cell queue for this service type is at least 90% full.                                                                                                                                                               |
|                                                       | <b>BW308</b>  | bwSwitchFabricUbrFault     | Warning  | UBR Cell Queue Congestion Alarm. Atm cell queue for this service type is at least 90% full.                                                                                                                                                                   |
|                                                       | <b>BW309</b>  | bwSwitchFabricUbrPlusFault | Warning  | UBR-PLUS Cell Queue Congestion Alarm. Atm cell queue for this service type is at least 90% full.                                                                                                                                                              |
|                                                       | <b>BW310</b>  | bwSwitchFabricControlFault | Warning  | CONTROL Channel Cell Queue Congestion Alarm. Atm cell queue for this service type is at least 90% full.                                                                                                                                                       |
|                                                       | <b>BW311</b>  | bwResBandwAbiFault         | Warning  | This alarm is generated when reserved bandwidth dedicated to ABI lines connections on the network interface has exceeded the Bandwidth Congestion Threshold with respect to the amount of bandwidth configured the network interface for switched lines.      |
| <b>nnClkSyncFault<br/>(NORTEL-UEMG-CLOCKSYNC-MIB)</b> | <b>CLK301</b> | lossOfPhaseLock            | Minor    | Phase PLD [altera 7064b] detected a minimum phase difference greater than eight nano seconds. (FRAME PULSES BETWEEN ITPs DO NOT MATCH)                                                                                                                        |
|                                                       | <b>CLK302</b> | lossOfFramePulseLock       | Major    | Frame pulse alignment did not get established with the active card -- it should occur in the inactive card only.(FRAME PULSES BETWEEN ITP DO NOT MATCH)                                                                                                       |
|                                                       | <b>CLK303</b> | lossOfMyClock              | Major    | The high and low levels of the SYNC PLL clock are not toggling. (OUTPUT OF FREQUENCY PLL HAS BEEN LOST)                                                                                                                                                       |
|                                                       | <b>CLK304</b> | lossOfMateClock            | Minor    | The high and Low levels of the mate clock are not toggling                                                                                                                                                                                                    |
|                                                       | <b>CLK305</b> | lossOfClockOutput          | Major    | Phase PLD reference clock oscillator not toggling. (OUTPUT OF PHASE PLL HAS BEEN LOST)                                                                                                                                                                        |
|                                                       | <b>CLK306</b> | singleReferenceFailure     | Minor    | Single monitored reference source has been lost                                                                                                                                                                                                               |
|                                                       | <b>CLK307</b> | allReferenceFailure        | Major    | Absolute and Delta reference source signals have been lost                                                                                                                                                                                                    |
|                                                       | <b>CLK308</b> | singleSyncUnitFailure      | Major    | Stratum 3 unit on ITP failed                                                                                                                                                                                                                                  |
|                                                       | <b>CLK312</b> | signalLos                  | Minor    | Single/All source reference occurred due to loss of signal                                                                                                                                                                                                    |
|                                                       | <b>CLK313</b> | signalLof                  | Minor    | Single/All source(s) reference occurred due to out of frame                                                                                                                                                                                                   |
|                                                       |               | FlashRsrc                  | Major    | Flash Memory                                                                                                                                                                                                                                                  |
|                                                       |               | ProcessorRsrc              | Major    | Processor                                                                                                                                                                                                                                                     |
|                                                       |               | idpromRsrc                 | Major    | idprom                                                                                                                                                                                                                                                        |
|                                                       |               | Atm50PortRsrc              | Minor    | ATM200 Port [0-19]: Not at 200 speed, or Init failed                                                                                                                                                                                                          |
|                                                       |               | RamRsrc                    | Major    | RAM                                                                                                                                                                                                                                                           |
|                                                       |               | CardTypeMismatchRsrc       | Critical | Incorrect Card In Slot                                                                                                                                                                                                                                        |
|                                                       |               | RedundancyLostRsrc         | Warning  | Simplex Mode - No Redundancy                                                                                                                                                                                                                                  |
|                                                       |               | CardPairOOSRsrc            | Warning  | Active/Master Card Out Of Service                                                                                                                                                                                                                             |
|                                                       |               | CardRsrc                   | Major    | DS1 Card                                                                                                                                                                                                                                                      |
|                                                       |               | DS1Aal1SarRsrc             | Major    | AAL1 SAR - DS1 Card TDM to ATM converter                                                                                                                                                                                                                      |
|                                                       |               | DS1LinkRsrc                | Minor    | DS1 Link [0 to 15]                                                                                                                                                                                                                                            |
|                                                       |               | DS1FramerRsrc              | Major    | DS1 Framer for DS1 links [0-7, or 8-15]                                                                                                                                                                                                                       |
|                                                       |               | DS1LIURsrc                 | Major    | DS1 Line IF Unit for DS1 links [0-7, or 8-15]                                                                                                                                                                                                                 |
|                                                       |               | CardRsrc                   | Major    | ITP card                                                                                                                                                                                                                                                      |
|                                                       |               | ITPTimeswitchRsrc          | Major    | Timeswitch - call processing enging                                                                                                                                                                                                                           |

|  |       |                           |                |                                                                        |
|--|-------|---------------------------|----------------|------------------------------------------------------------------------|
|  | NE301 | ITPDspServiceCircuitsRsrc | Major          | DSP [0-3]                                                              |
|  |       | ITPEchoCancellationRsrc   | Minor          | ECAN                                                                   |
|  |       | ITPAal1SarRsrc            | Major          | AAL1 SAR - Call Traffic TDM to ATM converter                           |
|  |       | ITPAtmBusControllerRsrc   | Major          | Serial Link Control - controls communication with ITX cards            |
|  |       | ITPDdcdIdpromRsrc         | Minor          | DDC Idprom - DSP Daughter Card Idprom                                  |
|  |       | ITPDdcCalistoRsrc         | Major          | DDC Calisto - DSP Daughter Card Calisto                                |
|  |       | ITPVoicePathRsrc          | Critical       | Voice Path                                                             |
|  |       | CardRsrc                  | Major          | ITX Card                                                               |
|  |       | CardRsrc                  | Major          | SCO/SCI card                                                           |
|  |       | SCTerminalIfRsrc          | Warning        | RS-232 Port                                                            |
|  |       | SCBootFlashMemRsrc        | Warning        | Flash Memory containing software load                                  |
|  |       | SCLocalBusRamRsrc         | Major          | Local Memory                                                           |
|  |       | SCEthernetIfRsrc          | Warning        | Ethernet port                                                          |
|  |       | SCSWRsrc                  | Minor          | ATM Switch - MMC Chipset                                               |
|  |       | SCNetworkIfRsrc           | Major          | Network Interface (SCO) [0-7] (SCI)                                    |
|  |       | SCAtmFwdRsrc              | Critical       | ATM Cell Forwarder                                                     |
|  |       | CardRsrc                  | Major          | ABI card                                                               |
|  |       | ABITimeswitchNetSideRsrc  | Major          | Timeswitch - call p engine (network side)                              |
|  |       | ABITimeswitchLineSideRsrc | Major          | Timeswitch - call p engine (Line side)                                 |
|  |       | ABITimeswitchRsrc         | Major          | Timeswitch - call processing engine                                    |
|  |       | ABIEchoCancellationRsrc   | minor          | ECAN - unit 0<br>ECAN - unit 1                                         |
|  |       | ABIAal1SarRsrc            | Major          | AAL1 SAR - Call Traffic TDM to ATM converter                           |
|  |       | ABIAal1NetSideRsrc        | Major          | Aal1 Network side - unit 0<br>Aal1 Network side - unit 1               |
|  |       | ABIAal1LineSideRsrc       | Major          | Aal1 Line side - unit 0<br>Aal1 Line side - unit 1                     |
|  |       | ABIAtmBusControllerRsrc   | Major          | Serial Link Control - controls communication with ITX cards            |
|  |       | ABIVoicePathRsrc          | Critical       | Voice Path                                                             |
|  |       | CardRsrc                  | Major          | 8X8 ADSL Card                                                          |
|  | NE302 | AtmDataSyncRsrc           | Critical       | ATM Data Sync                                                          |
|  |       | BalDataSyncRsrc           | Critical       | BAL Data Sync                                                          |
|  |       | MegacoDataSyncRsrc        | Critical       | Megaco Data Sync                                                       |
|  |       | BaseSubsystemRsrc         | Critical       | Startup failure: Base Platform                                         |
|  |       | CarmSubsystemRsrc         | Critical       | Startup failure: Carrier Maintenance                                   |
|  |       | NodeSubsystemRsrc         | Critical       | Startup failure: Node Maintenance                                      |
|  |       | MegacoSubsystemRsrc       | Critical       | Startup failure: Megaco                                                |
|  |       | DLMSubsystemRsrc          | Critical       | Startup failure: Data Line Maintenance                                 |
|  |       | TestSubsystemRsrc         | Critical       | Startup failure: Test Mib                                              |
|  |       | MTASubsystemRsrc          | Critical       | Startup failure: MTA Mib                                               |
|  |       | ShfSubsystemRsrc          | Critical       | Startup failure: Shelf Maintenance                                     |
|  |       | LineSubsystemRsrc         | Critical       | Startup failure: Line Maintenance                                      |
|  |       | ClkSyncSubsystemRsrc      | Critical       | Startup failure: Clock Sync Mib                                        |
|  |       | PatchSubsystemRsrc        | Critical       | Startup failure: Patching                                              |
|  |       | DTASubsystemRsrc          | Critical       | Startup failure: DTA                                                   |
|  |       | MegOMsSubsystemRsrc       | Critical       | Startup failure: Megaco OMs                                            |
|  |       | UpgSubsystemRsrc          | Critical       | Startup failure: Software Upgrade                                      |
|  |       | SnmpMASubsystemRsrc       | Critical       | Startup failure: SNMP Master Agent                                     |
|  |       | TimeSubsystemRsrc         | Critical       | Startup failure: Time of Day                                           |
|  |       | ESASubsystemRsrc          | Critical       | Startup failure: ESA                                                   |
|  |       | LKMSubsystemRsrc          | Critical       | Startup failure: Link Maintenance                                      |
|  |       | MarketFitSubsystemRsrc    | Critical       | Startup failure: Market Fit                                            |
|  |       | TestRsrc                  | variable       | Test Resource                                                          |
|  |       | HeapRsrc                  | Critical/Major | Low Memory                                                             |
|  |       | MateCommunicationRsrc     | Critical       | Mate Card Communication Failure                                        |
|  |       | SCAtmCPCSUniRsrc          | Major          | CPCS UNI Signalling                                                    |
|  |       | ITPWBCallConnRsrc         | Major          | Call Control Connection                                                |
|  |       | NEDataSyncRsrc            | Critical       | NE Data Sync                                                           |
|  |       | ABIWBCallConnRsrc         | Major          | Call Control Connection                                                |
|  | NE303 |                           | Crit/Maj/Minor | Card Restored (SWACT and now inactive)                                 |
|  |       | DS1NetworkLinkRsrc        | Minor          | Link to DCC Card in slot [10 or 11] - Isolation In Progress            |
|  |       | ITPLineSideExternalRsrc   | Minor          | Line Card 0, or link to Line Card                                      |
|  |       | ITPNetworkLinkRsrc        | Minor          | Link to ITX, port [0 to 1] - Isolation in progress<br>Link to Mate ITP |

|                                     |       |                        |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------|-------|------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| norNodeFault (NORTEL-UEMG-NODE-MIB) | NE304 | ITXLinkRsrc            | Minor | Link to DCC in slot [10 or 11] - Isolation in progress<br>Link 4 to ITP card - Isolation in progress<br>Link 5 to ITP card - Isolation in progress<br>Link 6 to ITP card - Isolation in progress<br>Link 7 to ITP card - Isolation in progress<br>Link 8 to ITP card - Isolation in progress<br>Link 9 to ITP card - Isolation in progress<br>Link 10 to ITP card - Isolation in progress<br>Link 11 to ITP card - Isolation in progress<br>Link 12 to ITP card - Isolation in progress<br>Link 13 to ITP card - Isolation in progress<br>Link 14 to ITP card - Isolation in progress<br>Link 15 to ITP card - Isolation in progress<br>Link 16 to ITP card - Isolation in progress<br>Link 17 to ITP card - Isolation in progress<br>Link 18 to ITP card - Isolation in progress<br>Link 19 to ITP card - Isolation in progress                                                                                                                                                           |
|                                     |       | SCLineLinkRsrc         | Minor | Link to Master Shf ITP 13 - Isolation in progress<br>Link to Master Shf ITP 12 - Isolation in progress<br>Link to Mate DCC - Isolation in progress<br>Link to card in slot 2 - Isolation in progress<br>Link to card in slot 6 - Isolation in progress<br>Link to card in slot 14 - Isolation in progress<br>Link to card in slot 18 - Isolation in progress<br>Link to card in slot 3 - Isolation in progress<br>Link to card in slot 7 - Isolation in progress<br>Link to card in slot 15 - Isolation in progress<br>Link to card in slot 19 - Isolation in progress<br>Link to card in slot 4 - Isolation in progress<br>Link to card in slot 8 - Isolation in progress<br>Link to card in slot 16 - Isolation in progress<br>Link to card in slot 20 - Isolation in progress<br>Link to card in slot 5 - Isolation in progress<br>Link to card in slot 9 - Isolation in progress<br>Link to card in slot 17 - Isolation in progress<br>Link to card in slot 21 - Isolation in progress |
|                                     |       | ABINetworkLinkRsrc     | minor | Link to DCC Card in slot 10 - Isolation in progress<br>Link to DCC Card in slot 11 - Isolation in progress                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                     | NE305 | Aal5SarRsrc            | Major | AAL5-SAR, Messaging                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                     |       | DS1NetworkExternalRsrc | minor | EXTERNAL: DCC Slot 10<br>EXTERNAL: DCC Slot 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                     |       | DS1NetworkPortRsrc     | Minor | Serial Device 0 - to DCC Card in slot 10<br>Serial Device 1 - to DCC Card in slot                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                     |       | DS1UtopiaBridgeRsrc    | Major | Utopia Bus Master - AAL1, AAL5 to ATM PHYs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                     |       | ITPNetworkExternalRsrc | Minor | EXTERNAL: Mate ITP<br>EXTERNAL: ITX attached to port [0,1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                     |       | ITPNetworkPortRsrc     | Minor | Serial Device [0 to 1] - to ITX cards<br>HDLC Device - Connects to mate ITP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                     |       | ITPLineSidelfRsrc      | Major | Serial device 0 - to Line Card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                     |       | ITPDDCAAL5SARRsrc      | Major | DDC AAL5 SAR - Call Traffic TDM to IP converter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                     |       | ITXExternalRsrc        | Minor | EXTERNAL: DCC Slot 10 serial device<br>EXTERNAL: DCC Slot 11 serial device<br>EXTERNAL: ITP attached to port [0-7]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                     |       | ITXPortRsrc            | Minor | Serial Device 0 - to DCC card in slot 10<br>Serial Device 1 - to DCC card in slot 11<br>Serial Device 4 - to ITP card<br>Serial Device 5 - to ITP card<br>Serial Device 6 - to ITP card<br>Serial Device 7 - to ITP card<br>Serial Device 8 - to ITP card<br>Serial Device 9 - to ITP card<br>Serial Device 10 - to ITP card<br>Serial Device 11 - to ITP card<br>Serial Device 12 - to ITP card<br>Serial Device 13 - to ITP card<br>Serial Device 14 - to ITP card<br>Serial Device 15 - to ITP card<br>Serial Device 16 - to ITP card<br>Serial Device 17 - to ITP card<br>Serial Device 18 - to ITP card<br>Serial Device 19 - to ITP card                                                                                                                                                                                                                                                                                                                                             |
|                                     |       | ITXLineSideGrpRsrc     | Major | Link [0 to 7] to ITP pair                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                     |       | ITXNetForwarderRsrc    | Major | Net side cell forwarder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

|  |       |                          |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--|-------|--------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |       | ITXLineForwarderRsrc     | Major    | Line side cell forwarder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|  |       | SCLineExternalRsrcs      | Minor    | EXTERNAL: Master Shelf ITP slot 13<br>EXTERNAL: Master Shelf ITP slot 12<br>EXTERNAL: Mate DCC<br>EXTERNAL: Card in slot [2-9, 14-21]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|  |       | SCLinePortRsrc           | Minor    | Serial Device 0 - to Master Shelf ITP Slot 13<br>Serial Device 1 - to Master Shelf ITP Slot 12<br>Serial Device 3 - Link to Mate DCC Card<br>Serial Device 4 - to card in slot 2<br>Serial Device 5 - to card in slot 6<br>Serial Device 6 - to card in slot 14<br>Serial Device 7 - to card in slot 18<br>Serial Device 8 - to card in slot 3<br>Serial Device 9 - to card in slot 7<br>Serial Device 10 - to card in slot 15<br>Serial Device 11 - to card in slot 19<br>Serial Device 12 - to card in slot 4<br>Serial Device 13 - to card in slot 8<br>Serial Device 14 - to card in slot 16<br>Serial Device 15 - to card in slot 20<br>Serial Device 16 - to card in slot 5<br>Serial Device 17 - to card in slot 9<br>Serial Device 18 - to card in slot 17<br>Serial Device 19 - to card in slot 21 |
|  |       | SCQuadSerContGrpRsrc     | Major    | Group of Serial Ports                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|  |       | ABINetworkExternalRsrc   | Minor    | EXTERNAL: DCC slot [10 or 11]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  |       | ABINetworkPortRsrc       | minor    | Serial Device 0 - to DCC Card in slot 10<br>Serial Device 1 - to DCC Card in slot 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|  |       | ABINetworkSideGrpRsrc    | Critical | Both links to DCC Card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|  | NE306 | GlanRsrc                 | minor    | GLAN Link to hub on Active ITP card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  |       | ITPGlanHubRsrc           | Critical | GLAN Hub, communicates with other cards on shelf                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  | NE307 | ABILineSideIfRsrc        | Major    | DS512 port                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  |       | ABILineSideExternalRsrc  | minor    | XPM unit, or DS512 connection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  |       | ABILkmAllChnlsRsrc       | Major    | All DS512 channels closed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|  | NE308 | SCWanBlDrOAMPRsrc        | Major    | Inband Messaging OAMP Link [0,1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  |       | SCWanBlDrCCRsrc          | Major    | Inband Messaging CC Link [0,1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  |       | SCWanBlDrHBRsrc          | Major    | Heartbeat to Element Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  |       | SCWanBlDrDS512Rsrc       | Major    | Inband Messaging DS512 Link [0,1]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|  | NE309 | ITPClockSyncRsrc         | Critical | Clock Sync                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  |       | ITPClockPhaseLockRsrc    | Major    | Clock Sync: Loss of Phase Lock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  |       | ITPClockFramePulseRsrc   | Major    | Clock Sync: Loss of Frame Pulse Lock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|  |       | ITPClockMyClockRsrc      | Major    | Clock Sync: Loss of My Clock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  |       | ITPClockMateClockRsrc    | Minor    | Clock Sync: Loss of Mate Clock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  |       | ITPClockOutputRsrc       | Major    | Clock Sync: Loss of Clock Output                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  |       | ITPSyncSingleRefRsrc     | Minor    | Clock Sync: Single Reference Failure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|  |       | ITPSyncAllRefRsrc        | Major    | Clock Sync: All Reference Failure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|  |       | ITPSyncSingleSyncRsrc    | Major    | Clock Sync: Single Sync Unit Failure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|  |       | ITPSyncLOSRsrc           | Minor    | Clock Sync: Loss of Signal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  |       | ITPSyncOOFsrc            | Minor    | Clock Sync: Out of Frame                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|  |       | ITPClockRsrc             | variable | Clock Sync: Clock                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|  |       | ITPSyncRsrc              | variable | Clock Sync: Sync                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|  |       | ITPSyncHORsrc            | Minor    | Clock Sync: Holdover Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|  |       | SCBitsFwdRsrc            | Major    | BITS Forwarder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  |       | SCBitsRefRsrc            | Minor    | BITS clock reference [A or B]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|  | NE310 | ITXFramerRsrc            | Major    | Framer - timing synchronization device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|  |       | ITXBITSrefRsrc           | Minor    | BITS clock reference A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|  |       | ITXBITSrefRsrc           | Minor    | BITS clock reference B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|  |       | ITXNetworkSideIfPortRsrc | Minor    | Port 2 on serial device - port only used by Diagnostics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  |       | SCQuadsercontPortRsrc    | Minor    | Serial Port 1 - UNUSED link to ITP slot 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  |       | SCQuadsercontPortRsrc    | Minor    | Serial Port 0 - UNUSED link to ITP slot 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  | NE311 | SCSerLinkRsrc            | Minor    | Unused [was serial link #]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|  |       | SCOctalPhyContRsrc       | Warning  | Octal PHY [Unused] Device for ports [0-5] or [8-13]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|  |       | SCOctalPhyContPortRsrc   | Warning  | Octal PHY [Unused] Port [0-13]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | NE312 | SCTimeOfDayRsrc          | minor    | Time of Day: Access to time server [ip] failed                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|  | NE313 | ITPCableRsrc             | minor    | Cable configuration conflict                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|  |       | ITXCableRsrc             | Minor    | Cable configuration conflict, port [0 to 7]                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|  | NE314 | ABIActivityCableRsrc     | minor    | Activity control cable between ABI cards                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|  | NE315 | SCXcRsrc                 | Minor    | Backplane Cross Connect                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|  |       | SCLinksRsrc              | Major    | Resource Bandwidth                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|  |       | downstreamFIFO           | Major    | ADSL: Downstream FIFO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

|                                            |                 |                                |                |                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------|-----------------|--------------------------------|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                            | <b>NE316</b>    | downstreamHEC                  | Major          | ADSL: Downstream HEC error                                                                                                                                                                                                                                                                         |
|                                            |                 | atm50Fault                     | Critical       | ADSL: ATM50 fault                                                                                                                                                                                                                                                                                  |
|                                            |                 | upstream buffer overflow       | Critical       | ADSL: Upstream buffer overflow                                                                                                                                                                                                                                                                     |
|                                            |                 | downstream buffer overflow     | Critical       | ADSL: Downstream buffer overflow                                                                                                                                                                                                                                                                   |
|                                            |                 | atm device timeout             | Critical       | ADSL: ATM Device timeout                                                                                                                                                                                                                                                                           |
|                                            |                 | clock accuracy                 | Critical       | ADSL: Loss of clock accuracy                                                                                                                                                                                                                                                                       |
|                                            |                 | dsp lockup                     | Critical       | ADSL: DSP Lockup                                                                                                                                                                                                                                                                                   |
|                                            | <b>NE317</b>    |                                | Crit/Maj/Minor | Shelf SIC Card Alarm                                                                                                                                                                                                                                                                               |
|                                            |                 |                                | Crit/Maj/Minor | Shelf PIO Card Alarm                                                                                                                                                                                                                                                                               |
|                                            |                 |                                | Crit/Maj/Minor | Shelf BIP card Alarm                                                                                                                                                                                                                                                                               |
|                                            | <b>NE318</b>    |                                | Major          | SCI Card NE Proxy                                                                                                                                                                                                                                                                                  |
|                                            | <b>NE320</b>    | AudRecoveryRsrc                | Major          | Require Audit Recovery Executed                                                                                                                                                                                                                                                                    |
| <b>MG9000 Manager Reported Faults</b>      | <b>MGEM300</b>  | EmDbUnavailable                | Major          | Generated when MG9000 EM is not able to make connection to the Element Manager Database                                                                                                                                                                                                            |
|                                            | <b>MGEM301</b>  | CommsLostToNE                  | Critical       | Generated when the MG9000 EM loses SNMP communication with MG9000                                                                                                                                                                                                                                  |
|                                            | <b>MGEM302</b>  | invalidEMIPAddress             | Major          | Generated when the MG9000 Manager has added an ne MG9000 and tries to discover the NE. It will check the MG9000 EM IP address provisioned at the MG9000 and if it is incorrect will raise this alarm                                                                                               |
|                                            | <b>MGEM303</b>  | AlarmsBeingThrottled           | Critical       | Generated when the MG9000 sends too many alarms within a 5 second window. When this happens the MG9000 Manager will request this particular MG9000 stop sending Alarms and display this particular alarm. This condition will clear when the number of alarm within 5 sec falls below a set number |
|                                            | <b>MGEM304</b>  | MG9K AlarmAuditFailed          | Critical       | Alarm Audit Failed - The alarm audit on the GW failed                                                                                                                                                                                                                                              |
| <b>(MEDIA_GATEWAY_MIB)</b>                 | <b>MGC300</b>   | medGwyInvalidControllerAddress |                | Indicates that a message was received from a controller that did not match any valid controller IP Address.                                                                                                                                                                                        |
|                                            | <b>MGC301</b>   | medGwyInvalid-TerminationId    |                | Indicates a mismatch of Termination ID                                                                                                                                                                                                                                                             |
|                                            | <b>MGC302</b>   | medGwyInvalidPackageElement    |                | Indicates that a message was received from a controller that contained an event, signal, or descriptor that was not recognized for the package                                                                                                                                                     |
| <b>nMtaFault (NORTEL_MG_MT_A_mib)</b>      | <b>TEST302</b>  | sicSysHardwareFault            |                |                                                                                                                                                                                                                                                                                                    |
|                                            | <b>TEST303</b>  | mtaSysHardwareFault            |                |                                                                                                                                                                                                                                                                                                    |
|                                            | <b>TEST 304</b> | sysConfigAmbiguity             |                |                                                                                                                                                                                                                                                                                                    |
| <b>nnEsaFault (NORTEL-UEMG-ESA-MIB)</b>    | <b>ESA300</b>   | esaStatusChange                | Critical       | Communication between GWC and GW is lost. Entered ESA mode                                                                                                                                                                                                                                         |
|                                            | <b>ESA301</b>   | esaDataFileFailure             | Critical       | Data download of ESA data from the CS2K Core has failed                                                                                                                                                                                                                                            |
|                                            | <b>ESA303</b>   | esaEnterFailure                | Critical       | Failed to enter ESA                                                                                                                                                                                                                                                                                |
| <b>nnEsaColFault (NORTEL-UEMG-ESA-MIB)</b> | <b>ESA304</b>   | esaCommOfInterest              | Major          | This log is generated by the EM in response to a trap from the MG9000 (nnEsaColFault). The MG9000 sends this trap when it detects communication problems to other nodes in the same community of interest.                                                                                         |
| <b>MG9000 Manager Reported Faults</b>      | <b>ESA302</b>   |                                | Critical       | Failed to set up FTP connection: login failure - EM failed to push ESA to VMG                                                                                                                                                                                                                      |
|                                            | <b>ESA312</b>   |                                | Major          | This log is generated by the EM when a failure occurs whilst trying to provision internodal community of interest data for a given NE.                                                                                                                                                             |

|                                                           |                |                            |             |                                                                                                                                                                                                                                               |
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| <b>nnMegacoFault<br/>(NORTEL-UEMG-<br/>MEGACO-MIB)</b>    | <b>VMG300</b>  | VMG OOS                    | Critical    | Generated when Root Termination goes out of service (Communication between Gateway and GWC is lost and ESA is not enabled)                                                                                                                    |
| <b>nnMegacoQosFault<br/>(NORTEL-UEMG-<br/>MEGACO-MIB)</b> | <b>VMG301</b>  | BadCalls                   | Minor       | QoS Alarm that is generated when the number of bad call reaches a certain threshold                                                                                                                                                           |
|                                                           | <b>VMG302</b>  | PacketLoss                 | Minor       | QoS Alarm that is generated when the number of Packet Loss reaches a certain threshold                                                                                                                                                        |
|                                                           | <b>VMG303</b>  | Jitter                     | Minor       | QoS Alarm that is generated when IP message Jitter reaches a certain threshold                                                                                                                                                                |
|                                                           | <b>VMG304</b>  | Latency                    | Minor       | QoS Alarm that is generated when IP message Latency reaches a certain threshold                                                                                                                                                               |
|                                                           | <b>VMG311</b>  |                            | Major       | Application layer framing (ALF) alarm occurs when the MG 9000 is experiencing Megaco retransmissions greater than 50 % for a period of 5 minutes or more.                                                                                     |
|                                                           | <b>VMG312</b>  |                            | Major       | Megaco task alarm indicates one or more of the Megaco Task's input buffers are over 90 % full for a period of 5 minutes or more.                                                                                                              |
|                                                           | <b>VMG322</b>  | vmgAdminStatusOutOfService | Critical    | Admin State Out Of Service - Call Processing Out of Service                                                                                                                                                                                   |
|                                                           | <b>VMG323</b>  | cardInitializing           | Critical    | VMG Initializing - Call Processing Out of Service                                                                                                                                                                                             |
|                                                           | <b>VMG324</b>  | cardLocked                 | Critical    | Card Locked - Call Processing Out of Service                                                                                                                                                                                                  |
|                                                           | <b>VMG325</b>  | cardDisabled               | Critical    | Card Disabled - Call Processing Out of Service                                                                                                                                                                                                |
|                                                           | <b>VMG328</b>  | lineMtcNotReady            | Critical    | Line Maintenance Not Ready - Call Processing Out of Service                                                                                                                                                                                   |
|                                                           | <b>VMG329</b>  | megacoMtcNotReady          | Critical    | Megaco Maintenance Not Ready - Call Processing Out of Service                                                                                                                                                                                 |
|                                                           | <b>VMG373</b>  | gwcUnreachable             | Critical    | GWC Unreachable - Call Processing Out of Service                                                                                                                                                                                              |
|                                                           | <b>VMG374</b>  | noGwcReply                 | Critical    | GWC Reachable But No Reply To Service Change - Check LGRP/GWC state - Call Processing Out of Service                                                                                                                                          |
|                                                           | <b>VMG376</b>  | aallBearerSubsysNotReady   | Critical    | AAL1 Bearer Not Ready - Call Processing Out of Service                                                                                                                                                                                        |
|                                                           | <b>VMG377</b>  | ipBearerSubsysNotReady     | Critical    | IP Bearer Not Ready - Call Processing Out of Service                                                                                                                                                                                          |
| <b>Performance<br/>(NORTEL-UEMG-<br/>PERFMON-MIB)</b>     | <b>OVLD304</b> | Performance Degraded       | Minor/Major | Overload Detection Alarm that is generated whenever the MG9000 actually enters an overload condition.                                                                                                                                         |
| <b>SCTP (NORTEL-UEMG-<br/>RELMSGING-MIB)</b>              | <b>OVLD808</b> | relMsgLinkFail             | Critical    | An external messaging link has closed and cannot send/receive                                                                                                                                                                                 |
|                                                           | <b>OVLD809</b> | relMsgLinkSevDegraded      | Major       | Message loss is high enough such that the message link is in a degraded service state. For ABI, this would mean that some calls are failing and perhaps maintenance action are failing (e.g. static data download, etc)                       |
|                                                           | <b>OVLD810</b> | relMsgLinkDegraded         | Minor       | Message retransmissions are high enough that system is starting to see performance degradation. Potentially, this could mean increased latency, reduced messaging through the system, buffer overflows and perhaps heading toward congestion. |
|                                                           | <b>GIGE301</b> | LOS                        | Critical    | Loss of Signal                                                                                                                                                                                                                                |



|                                      |                |                            |          |                                                                                                                                                                                              |
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| <b>GIGE (NORTEL-UEMG-GIGE-MIB)</b>   | <b>GIGE302</b> | RFI                        | Critical | Remote Failure Indication                                                                                                                                                                    |
|                                      | <b>GIGE303</b> | TxF                        | Critical | Transmit Failure                                                                                                                                                                             |
|                                      | <b>GIGE304</b> | TEM                        | Critical | threshold exceeded                                                                                                                                                                           |
|                                      | <b>GIGE305</b> | POW                        | Critical | Low Power Indicated                                                                                                                                                                          |
|                                      | <b>GIGE306</b> | RxSD                       | Critical | Transmit Signal Degraded                                                                                                                                                                     |
|                                      | <b>GIGE307</b> | RxEER                      | Critical | Transmit Excessive Error Ratio                                                                                                                                                               |
|                                      | <b>GIGE308</b> | TBC                        | Critical | Transmit Bias Current                                                                                                                                                                        |
|                                      | <b>GIGE309</b> | LINT                       | Critical | Link Initialization                                                                                                                                                                          |
|                                      | <b>GIGE310</b> | OPT                        | Critical | Transmit Optical Power                                                                                                                                                                       |
|                                      | <b>GIGE311</b> | OPR                        | Critical | Receive Optical Power                                                                                                                                                                        |
|                                      | <b>GIGE312</b> | GARP                       | Critical | GARP failure                                                                                                                                                                                 |
|                                      | <b>GIGE313</b> | LKINT                      | Critical | Link Integrity Failure                                                                                                                                                                       |
|                                      | <b>GIGE314</b> | Auto negotiation           | Critical | Auto negotiation Failure                                                                                                                                                                     |
|                                      | <b>GIGE315</b> | non preferred link         | Critical | Non Preferred Link is active                                                                                                                                                                 |
|                                      | <b>OMC300</b>  |                            | Critical | Indicates that OM Collector failed to collect OM file from MG9K during a particular collection interval.                                                                                     |
| <b>IPSec (NORTEL-UEMG-IPSEC-MIB)</b> | <b>IPSC300</b> | ipsecMismatchSharedKey     | Critical | During negotiation, the key received did not match the one locally set                                                                                                                       |
|                                      | <b>IPSC301</b> | ipsecIkePeerLinkExpired    | Critical | Phase 1 security association has expired or not present                                                                                                                                      |
|                                      | <b>IPSC302</b> | ipsecSecurePeerLinkExpired | Critical | Phase 2 security association has expired or not present                                                                                                                                      |
|                                      | <b>IPSC303</b> | ipsecDoSCallp              | Critical | Packets are being replayed to the call processing interface. Possible Denial of Service attack                                                                                               |
|                                      | <b>IPSC304</b> | ipsecDoSMgmt               | Critical | Packets are being replayed to the call processing interface. Possible Denial of Service attack                                                                                               |
|                                      | <b>IPSC305</b> | ipsecMaxDiscardedPktRate   | Minor    | An inordinate percentage of the received/transmitted packets are being discarded as a result of current security policies. Indicates possible mis-configuration, or denial of service attack |
|                                      | <b>IPSC306</b> | ipsecRadiusTimeout         | Major    | MG9K's requests sent to RADIUS server has timed out                                                                                                                                          |

**MG9000 Reported Event LOGs**

| LOG Subsystem (MIB)                                 | LOG Id  | LOG Type                                                                                                                                                                                                                                                                                                                 | Description                                                                                                                                                                                               | SN06 VoA Telcordia Coverage? | Supported/ Enabled                                                                                                                                                                                                                                                                               | Procedure To Generate LOG                                                                                                                                                                                                                                               | EM Supported |
|-----------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| ATM Event (NORTEL-UEMG-ATM-MIB)                     | VC600   | atmIntfPvcFailures-Trap                                                                                                                                                                                                                                                                                                  | Indicates that one or more PVPLs or PVCLs on this interface has failed since the last atmPvcFailuresTrap was sent.                                                                                        | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | VC800   | nn5AtmIfThreshold                                                                                                                                                                                                                                                                                                        | Generated when an ATM interface stat exceeds the specified threshold                                                                                                                                      | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | VC801   | nnAtmStatsVcThreshTrap                                                                                                                                                                                                                                                                                                   | Generated when the VC stat exceeds specified threshold.                                                                                                                                                   | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
| Data Audit Event                                    | MGAU600 | AuditLogNotification                                                                                                                                                                                                                                                                                                     | Generated my the MG9000 Manager when an Audit is started, stopped, a data mismatch was found between them MG9000 and the MG9000 Manager, or a communications failure occurred while the Audit was running | N                            | yes                                                                                                                                                                                                                                                                                              | Clear the data from an ITP card, start the Audit, letting it run to completion.                                                                                                                                                                                         | SN05         |
| Bandwidth Event (NORTEL-UEMG-BANDWIDTH-MIB)         | BW800   | nnBwSwitchFabricCongestion                                                                                                                                                                                                                                                                                               | A nnBwSwitchFabricCongestion Notification is generated when one of the input cellQueues Cross the configured threshold percentage.                                                                        | N                            | yes                                                                                                                                                                                                                                                                                              | This fault is very difficult to produce during normal operations with a test set or manual action. The best way to generate this fault is using the following <b>Dshell</b> command. To do this "od" to SNMP and use the "bwevents" command with the "swfabric" option. | SN04         |
|                                                     | BW801   | nnBwBandwUtilizationCongestion                                                                                                                                                                                                                                                                                           | A nnBwBandwUtilization Notification is generated when the total or dsf's cell rates Cross the configured threshold percentage.                                                                            | N                            | yes                                                                                                                                                                                                                                                                                              | Set the DSL threshold (at BW Manager GUI an EM) to a low level, generate data traffic on a number of DSL lines until the LOG appears.                                                                                                                                   | SN04         |
| LOG Output Example                                  |         | NTL STD:<br><br>RTPS    BW800 JAN28 22:10:40 0462 THR   MG9K BW Switch Fabric Congestion<br>NE Number: 19<br>NE Name: CO_19<br>PhysLoc: Ne.ne19<br>Bandwidth Switch Fabric Congestion Type: CBR Switch Fabric Congestion Bandwidth<br>Bandwidth Notification Value: 70.0 %<br>Bandwidth Current Total Queue Fill: 90.0 % |                                                                                                                                                                                                           |                              | SCC2:<br><br>10 BW 800 8936 THR MG9K BW Switch Fabric Congestion<br>NE Number: 19<br>NE Name: CO_19<br>PhysLoc: Ne.ne19<br>Bandwidth Switch Fabric Congestion Type: CBR Switch Fabric Congestion Bandwidth<br>Bandwidth Notification Value: 70.0 %<br>Bandwidth Current Total Queue Fill: 90.0 % |                                                                                                                                                                                                                                                                         |              |
| DS1 Carrier Event (NORTEL-UEMG-CARRIER-MIB)         | MGCA500 | dsx1LineStatus-Change                                                                                                                                                                                                                                                                                                    | Trap is sent when the value of an instance dsx1LineStatus changes.                                                                                                                                        | N                            | yes                                                                                                                                                                                                                                                                                              | Remove the DS1 cable and replace                                                                                                                                                                                                                                        | SN04         |
|                                                     | MGCA600 | apsTrapSwitchover                                                                                                                                                                                                                                                                                                        | Sent when the value of an instance of apsChanSwitchover increments.                                                                                                                                       | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | MGCA601 | apsTrapModeMis-match                                                                                                                                                                                                                                                                                                     | Sent when the value of an instance of apsStatusModeMismatch increments                                                                                                                                    | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | MGCA602 | apsProtSwitchRejectEvent                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                           | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | MGCA800 | norCarrThreshold                                                                                                                                                                                                                                                                                                         | Sent when a Carrier exceeds the specified threshold on a given performance Measure.                                                                                                                       | N                            | yes                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                         | SN04         |
| BIP Input/Output State Change (NORTEL-UEMG-SHF-MIB) | SHLF501 | nnShfInputOutputOperStatus                                                                                                                                                                                                                                                                                               | TRAP sent when any BIP Input/Output state change event occurs for an Input/Output with an alarm severity of indeterminate.                                                                                | N                            | yes                                                                                                                                                                                                                                                                                              | Change any BIP Input/Output Alarm Severity setting to indeterminate and then follow test procedure for that alarm.                                                                                                                                                      | SN04         |
| Test Event                                          | TEST600 | testComplete                                                                                                                                                                                                                                                                                                             | Signifies that a test has completed for a particular entity                                                                                                                                               | N                            | yes                                                                                                                                                                                                                                                                                              | Run a Line test or Run a Line card Diag                                                                                                                                                                                                                                 | SN04         |
| Link Event                                          | LINK500 | linkDown                                                                                                                                                                                                                                                                                                                 | Signifies that the SNMPv2 entity has detected that the ifOperStatus object is about to enter the down state.                                                                                              | N                            | yes                                                                                                                                                                                                                                                                                              | Take the ITP card pair Lock and Offline                                                                                                                                                                                                                                 | SN04         |
|                                                     | LINK501 | linkUp                                                                                                                                                                                                                                                                                                                   | Signifies that the SNMP entity has detected that the ifOperStatus object left the down state.                                                                                                             | N                            | yes                                                                                                                                                                                                                                                                                              | Take the ITP card pair online and Unlocked                                                                                                                                                                                                                              | SN04         |
| Clock Sync Event (NORTEL-UEMG-CLOCKSYNC-MIB)        | CLK500  | ClockSyncChange                                                                                                                                                                                                                                                                                                          | A change has occurred for Clock Sync: timingModeChange (1), clockModeChange (2).                                                                                                                          | N                            | yes                                                                                                                                                                                                                                                                                              | Remove the Colck source cable to the ITX card                                                                                                                                                                                                                           | SN04         |
| SLoA Event                                          | SWL600  | nnMtaTrapConnectionStatus                                                                                                                                                                                                                                                                                                | Sent when SNM indicates status of the connection                                                                                                                                                          | N                            | yes                                                                                                                                                                                                                                                                                              | Put line under test                                                                                                                                                                                                                                                     | SN04         |
| MEGACO Event                                        | MGC500  | medGwyLinkStatus-Change                                                                                                                                                                                                                                                                                                  | Indicates that status of media gateway control link has changed.                                                                                                                                          | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | MGC501  | medGwyTermination-StatusChange                                                                                                                                                                                                                                                                                           | Sent when a termination changes Status.                                                                                                                                                                   | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
| SNMP Event                                          | SNMP600 | snmpEnableAuthen-Traps                                                                                                                                                                                                                                                                                                   | Indicates permission to generate authenticationFailure traps.                                                                                                                                             | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
|                                                     | SNMP601 | coldStart                                                                                                                                                                                                                                                                                                                | Signifies that the SNMP entity is reinitializing itself and its configuration may have been altered.                                                                                                      | N                            | yes                                                                                                                                                                                                                                                                                              | Initiate Coldstart from the MG9K LCI                                                                                                                                                                                                                                    | SN04         |
|                                                     | SNMP602 | warmStart                                                                                                                                                                                                                                                                                                                | Signifies that the SNMP entity is reinitializing itself such that its configuration is unaltered.                                                                                                         | n/a                          | no                                                                                                                                                                                                                                                                                               | N/A                                                                                                                                                                                                                                                                     | SN04         |
| Network Element Event (NORTEL-UEMG-NODE-MIB)        | NE500   | norNodeSwact                                                                                                                                                                                                                                                                                                             | Generated when the Node does a switch of activity.                                                                                                                                                        | N                            | yes                                                                                                                                                                                                                                                                                              | SWAC the OC3 card pair                                                                                                                                                                                                                                                  | SN04         |
|                                                     | NE501   | norNodeStateChange                                                                                                                                                                                                                                                                                                       | Generated when the Node changes state.                                                                                                                                                                    | N                            | yes                                                                                                                                                                                                                                                                                              | Take ITP OOS, put back inservice                                                                                                                                                                                                                                        | SN04         |
|                                                     | NE502   | DS1SpareOperationEvent                                                                                                                                                                                                                                                                                                   | Generated when a DS1 card is spared                                                                                                                                                                       | N                            | yes                                                                                                                                                                                                                                                                                              | Manually spare a ds1 card                                                                                                                                                                                                                                               | SN04         |
|                                                     | NE503   |                                                                                                                                                                                                                                                                                                                          | ABI Switch Mastership                                                                                                                                                                                     |                              | yes                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                         | SN06.2       |
|                                                     | NE504   |                                                                                                                                                                                                                                                                                                                          | ABI State Change                                                                                                                                                                                          |                              | yes                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                         | SN06.2       |
|                                                     | NE600   | entConfigChange                                                                                                                                                                                                                                                                                                          | Generated when the value of entLastChangeTime changes.                                                                                                                                                    | N                            | yes                                                                                                                                                                                                                                                                                              | Plug in new line card                                                                                                                                                                                                                                                   | SN04         |
|                                                     | NE601   | norNodeRestartBegin                                                                                                                                                                                                                                                                                                      | Generated when the Node is restarting.                                                                                                                                                                    | N                            | yes                                                                                                                                                                                                                                                                                              | Restart ITP card                                                                                                                                                                                                                                                        | SN04         |
|                                                     | NE602   | norNodeRestart-Complete                                                                                                                                                                                                                                                                                                  | Generated when the Node completes its Restart                                                                                                                                                             | N                            | yes                                                                                                                                                                                                                                                                                              | Same as above                                                                                                                                                                                                                                                           | SN04         |
|                                                     | NE603   | norNodeSWLoad-Complete                                                                                                                                                                                                                                                                                                   | Generated when the Node completes its SoftwareLoad.                                                                                                                                                       | N                            | yes                                                                                                                                                                                                                                                                                              | Load an ITP with new SW load                                                                                                                                                                                                                                            | SN04         |
|                                                     | NE604   | norNodeSWUpgrade-Complete                                                                                                                                                                                                                                                                                                | Generated when a SW Upgrade has completed                                                                                                                                                                 | N                            | yes                                                                                                                                                                                                                                                                                              | Same as above                                                                                                                                                                                                                                                           | SN04         |
|                                                     | NE605   |                                                                                                                                                                                                                                                                                                                          | Generated when a Network Element is deleted                                                                                                                                                               | N                            | yes                                                                                                                                                                                                                                                                                              | Delete a MG9K from the EM                                                                                                                                                                                                                                               | SN04         |
|                                                     | NE602   |                                                                                                                                                                                                                                                                                                                          | Generated when a Reinitialize Gateway event occurs                                                                                                                                                        | N                            | yes                                                                                                                                                                                                                                                                                              | Envoke the Reinitialize option on the OC3 card                                                                                                                                                                                                                          | SN05         |
|                                                     | NE607   | norNodeCardDeleted                                                                                                                                                                                                                                                                                                       | Generated when a card is deleted                                                                                                                                                                          | N                            | yes                                                                                                                                                                                                                                                                                              | Provision an MG9K card for deletion from the EM then pull the card from MG9K                                                                                                                                                                                            | SN04         |
|                                                     | NE608   | norNodeCardInserted                                                                                                                                                                                                                                                                                                      | Generated when a card is inserted                                                                                                                                                                         | N                            | yes                                                                                                                                                                                                                                                                                              | Insert a MG9K card at the MG9K                                                                                                                                                                                                                                          | SN04         |
|                                                     | NE609   |                                                                                                                                                                                                                                                                                                                          | generated whenever a user executes an image request                                                                                                                                                       | N                            | yes                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                         | SN07         |

|                                       |         |                            |                                                                                                                                                                                                                                                                                                                                                                              |     |     |                                                                                                                                                                     |        |
|---------------------------------------|---------|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Alarm Reliability Event               | ALM998  | AlarmSequenceError         | Generated when the MG9000 Manager detects it has missed Alarms from the MG9000                                                                                                                                                                                                                                                                                               | N   | yes | Break connection (OC3) to MG9K, generate a number of alarms at MG9K, resetup MG9K connection.                                                                       | SN04   |
|                                       | ALM999  | AlarmSequenceRestored      | Generated when the MG9000 Manager recovered the missing Alarms from the MG9000                                                                                                                                                                                                                                                                                               | N   | yes | Same as above                                                                                                                                                       | SN04   |
| DSL Event (NORTEL-UEMG-DSL-MIB)       | XDSL600 | adslAtucRateChangeTrap     | The ATUCs transmit rate has changed (RADSL mode only)                                                                                                                                                                                                                                                                                                                        | n/a | no  | N/A                                                                                                                                                                 | SN04   |
|                                       | XDSL601 | adslAtucInitFailureTrap    | ATUC initialization failed                                                                                                                                                                                                                                                                                                                                                   | n/a | no  | N/A                                                                                                                                                                 | SN04   |
|                                       | XDSL602 | adslAturRateChangeTrap     | The ATURs transmit rate has changed (RADSL mode only)                                                                                                                                                                                                                                                                                                                        | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL800 | adslAtucPerfLofsThreshTrap | Loss of Framing 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                         | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL801 | adslAtucPerfLossThreshTrap | Loss of Signal 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                          | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL802 | adslAtucPerfLprsThreshTrap | Loss of Power 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                           | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL803 | adslAtucPerfESsThreshTrap  | Errored Second 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                          | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL804 | adslAtucPerfLofsThreshTrap | Loss of Link 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                            | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL805 | adslAturPerfLofsThreshTrap | Loss of Framing 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                         | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL806 | adslAturPerfLossThreshTrap | Loss of Signal 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                          | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL807 | adslAturPerfLprsThreshTrap | LPRS 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                                    | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL808 | adslAturPerfESsThreshTrap  | Errored Second 15-minute interval threshold reached                                                                                                                                                                                                                                                                                                                          | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
|                                       | XDSL809 | nnDSLThreshold Trap        | a nnDSLThreshold notification is sent when a DSL Interface exceeds the specified threshold on a given performanceMeasure, specified by the nnDSLThresholdNotifyType:<br>atucfec (1),<br>atuccrc (2),<br>atucncd (3),<br>atucodc (4),<br>atuchec (5),<br>atucldc (6),<br>aturlec (7),<br>aturblockError (8),<br>atumcd (9),<br>aturodc (10),<br>aturhec (11),<br>aturldc (12) | N   | yes | Using an ADSL Modem <b>test set</b> inject large numbers of this type of error.                                                                                     | SN04   |
| Manager Upgrade Event                 | UPGD600 |                            | indicating an upgrade is needed.                                                                                                                                                                                                                                                                                                                                             | N   | yes | downgrade procedure. Follow MG9K EM upgrade procedures                                                                                                              | SN06   |
|                                       | UPGD601 |                            | indicating an export has started                                                                                                                                                                                                                                                                                                                                             | N   | yes | Requires no immediate action                                                                                                                                        | SN06   |
|                                       | UPGD602 |                            | indicating an export has completed                                                                                                                                                                                                                                                                                                                                           | N   | yes | Same as above                                                                                                                                                       | SN06   |
|                                       | UPGD603 |                            | indicating an import has started                                                                                                                                                                                                                                                                                                                                             | N   | yes | Same as above                                                                                                                                                       | SN06   |
|                                       | UPGD604 |                            | indicating an import has completed                                                                                                                                                                                                                                                                                                                                           | N   | yes | Same as above                                                                                                                                                       | SN06   |
| Manager Event                         | MGEM687 |                            | Indicates that an attempt to correct the database has failed for Line Circuit(s).                                                                                                                                                                                                                                                                                            | N   | yes |                                                                                                                                                                     | SN07   |
|                                       | MGEM688 |                            | Indicates that an attempt to correct the database has failed for Termination(s).                                                                                                                                                                                                                                                                                             | N   | yes |                                                                                                                                                                     | SN07   |
|                                       | MGEM689 |                            | Indicates that the Database is unavailable and correction failed.                                                                                                                                                                                                                                                                                                            | N   | yes |                                                                                                                                                                     | SN07   |
|                                       | MGEM699 |                            | MG9K Discovery Status Event                                                                                                                                                                                                                                                                                                                                                  | N   | yes |                                                                                                                                                                     | SN07   |
|                                       | MGEM700 |                            | MG9000 Manager Server application Startup                                                                                                                                                                                                                                                                                                                                    | N   | yes | Telnet into the MG9000 Manager server and execute the shutdown procedure then execute following command "/opt/nortel/mg9ksrv_06/bin/mg9kimpl start"                 | SN06   |
|                                       | MGEM701 |                            | MG9000 Manager Server application Shutdown                                                                                                                                                                                                                                                                                                                                   | N   | yes | Telnet into the MG9000 Manager server and execute the following command "/opt/nortel/mg9ksrv_06/bin/mg9kimpl stop"                                                  | SN06   |
|                                       | MGEM702 |                            | MG9000 Manager Mid-Tier Server application Startup                                                                                                                                                                                                                                                                                                                           | N   | yes | Telnet into the MG9000 Manager Mid-Tier server and execute the shutdown procedure then execute the following command "/opt/nortel/mg9kmttr_06/bin/mg9kmtimpl start" | SN06   |
|                                       | MGEM703 |                            | MG9000 Manager Mid-Tier Server application Shutdown                                                                                                                                                                                                                                                                                                                          | N   | yes | Telnet into the MG9000 Manager Mid-Tier server and execute the following command "/opt/nortel/mg9kmttr_06/bin/mg9kmtimpl stop"                                      | SN06   |
| OM Collector Event                    | OMC700  |                            | MG9000 Manager Mid-Tier Server OM Collector application Startup                                                                                                                                                                                                                                                                                                              | N   | yes | Telnet into the MG9000 Manager Mid-Tier server and execute the shutdown procedure then execute the following command "/opt/nortel/omcltr_06/bin/OMimpl start"       | SN06   |
|                                       | OMC701  |                            | MG9000 Manager Mid-Tier Server OM Collector application Shutdown                                                                                                                                                                                                                                                                                                             | N   | yes | Telnet into the MG9000 Manager Mid-Tier server and execute the following command "/opt/nortel/omcltr_06/bin/OMimpl stop"                                            | SN06   |
| Performance (NORTEL-UEMG-PERFMON-MIB) | OVL800  | ovldRscMonPduRateFault     | Pdu Rate Threshold crossed.                                                                                                                                                                                                                                                                                                                                                  |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL801  | ovldRscMonCbvMsgRFRFault   | Cbv Message Rate Overloaded Alarm                                                                                                                                                                                                                                                                                                                                            |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL802  | ovldRscMonConnQueFault     | Connection Queue Overloaded Alarm.                                                                                                                                                                                                                                                                                                                                           |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL803  | ovldRscMonCpuUtilFault     | PDU Rate Overloaded Alarm.                                                                                                                                                                                                                                                                                                                                                   |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL804  | perfMonCPUFault            | CPU Utilization Overloaded Alarm                                                                                                                                                                                                                                                                                                                                             |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL805  | perfMonRamFault            | RAM Utilization Overloaded Alarm                                                                                                                                                                                                                                                                                                                                             |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL806  | perfMonFlashFault          | Flash Utilization Overloaded Alarm                                                                                                                                                                                                                                                                                                                                           |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | OVL807  | perfMonChannFault          | Chan Utilization Overloaded Alarm                                                                                                                                                                                                                                                                                                                                            |     | yes |                                                                                                                                                                     | SN06.2 |
|                                       | VMG600  |                            | Indicates that termination data was successfully provisioned in all appropriate areas except for the database.                                                                                                                                                                                                                                                               | N   | yes |                                                                                                                                                                     | SN07   |
|                                       | VMG601  |                            | Indicates that an attempt to correct termination data in the database has passed.                                                                                                                                                                                                                                                                                            | N   | yes |                                                                                                                                                                     | SN07   |
|                                       | REX600  |                            | Indicates the start or completion of REX on a card/card-pair. The cards under consideration are ITP, ITX and DCC.                                                                                                                                                                                                                                                            |     | yes |                                                                                                                                                                     | SN08   |
|                                       | REX601  |                            | Indicates the success or failure of REX on a card/card-pair. The cards under consideration are ITP, ITX and DCC.                                                                                                                                                                                                                                                             |     | yes |                                                                                                                                                                     | SN08   |
|                                       | REX602  |                            | Indicates that the REX for the card/card-pair under consideration has been skipped. The card types considered are ITP, ITX and DCC.                                                                                                                                                                                                                                          |     | yes |                                                                                                                                                                     | SN08   |

# MG9000 Manager User Action Audit LOGs

| LOG Subsystem  | LOG Id  | LOG Type      | Description                                                                 | SN06 VoA Telcordia Coverage? | Procedure To Generate LOG                                                |
|----------------|---------|---------------|-----------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------|
| MG9000 Manager | MGEM600 | MG9000 HW     | SWACT of ABI, ITP, ITX, OC3, or IMA card                                    | n/a                          | See procedures in MG9000 FCAPS Document Fault Management section         |
|                | MGEM601 | MG9000 HW     | Lock of ABI, ITP, ITX, OC3, IMA, DS1, MTA, WLC, SAA, XDSL, SIC card         | n/a                          | See procedures in MG9000 FCAPS Document Fault Management section         |
|                | MGEM602 | MG9000 HW     | Unlock of ABI, ITP, ITX, OC3, IMA, DS1, MTA, WLC, SAA, XDSL, SIC card       | n/a                          | See procedures in MG9000 FCAPS Document Fault Management section         |
|                | MGEM603 | MG9000 HW     | Force Lock of ABI, ITP, ITX, OC3, IMA, DS1, MTA, WLC, SAA, XDSL, SIC card   | n/a                          | See procedures in MG9000 FCAPS Document Fault Management section         |
|                | MGEM604 | MG9000 HW     | Force Unlock of ABI, ITP, ITX, OC3, IMA, DS1, MTA, WLC, SAA, XDSL, SIC card | n/a                          | See procedures in MG9000 FCAPS Document Fault Management section         |
|                | MGEM605 | MG9000 HW     | Diag of ABI, ITP, ITX, OC3, IMA, DS1, MTA, WLC, SAA, XDSL, SIC card         | n/a                          | See procedures in MG9000 FCAPS Document Fault Management section         |
|                | MGEM606 | SLoA Services | Create a VMG                                                                | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM607 | SLoA Services | Delete a VMG                                                                | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM608 | SLoA Services | ESA data configuration                                                      | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM609 | SLoA Services | Gateway data configuration                                                  | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM610 | SLoA Services | Create Termination                                                          | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM611 | SLoA Services | Bulk Termination creation                                                   | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM612 | SLoA Services | Create ESA Service Code                                                     | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM613 | SLoA Services | Delete ESA Service Code                                                     | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM614 | SLoA Services | Delete Termination                                                          | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM615 | SLoA Services | Bulk Termination deletion                                                   | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM616 | SLoA Services | Delete all termination on a card                                            | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM617 | SLoA Services | Change Termination data                                                     | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM618 | PLoA Services | Create a PLoA Passive Endpoint                                              | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM619 | PLoA Services | Create a PLoA Active Endpoint                                               | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM620 | PLoA Services | Create a PLoA Hairpin connection                                            | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM621 | PLoA Services | PLoA Connection Admin State change                                          | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM622 | PLoA Services | PLoA Service Restart                                                        | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM623 | PLoA Services | PLoA Connection SVC test initiated                                          | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM624 | PLoA Services | PLoA Connection SVC test abort                                              | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM625 | PLoA Services | PLoA Connection Unlock test                                                 | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM626 | PLoA Services | Delete a PLoA Endpoint                                                      | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM627 | ADSL Services | Modify ADSL data circuit provisioning attributes                            | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM628 | ADSL Services | De-provision ADSL data circuit service                                      | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM629 | ADSL Services | Add new ADSL data circuit                                                   | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM630 | ADSL Services | Change ADSL data circuit                                                    | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM631 | ADSL Services | Delete ADSL data circuit                                                    | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM632 | DS1 IMA       | Set links in DS1 IMA group                                                  | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM633 | DS1 IMA       | Start DS1 IMA group pattern test                                            | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM634 | DS1 IMA       | Stop DS1 IMA group pattern test                                             | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM635 | DS1 IMA       | Add DS1 IMA link to group                                                   | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM636 | DS1 IMA       | Remove DS1 IMA link from group                                              | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM637 | DS1 IMA       | Set administration state on DS1 IMA link                                    | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM638 | DS1 IMA       | Set configuration state on DS1 IMA link                                     | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM639 | Carrier       | OC3, DS1 IMA, DS1, DS0, carrier lock                                        | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM640 | Carrier       | OC3, DS1 IMA, DS1, DS0, multiple carrier lock                               | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM641 | Carrier       | OC3, DS1 IMA, DS1, DS0, carrier unlock                                      | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM642 | Carrier       | OC3, DS1 IMA, DS1, DS0, multiple carrier unlock                             | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM643 | Carrier       | OC3, DS1 IMA, DS1, DS0, forced carrier lock                                 | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM644 | Carrier       | OC3, DS1 IMA, DS1, DS0, forced multiple carrier lock                        | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM645 | Carrier       | OC3, DS1 IMA, DS1, DS0, forced carrier unlock                               | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM646 | Carrier       | OC3, DS1 IMA, DS1, DS0, forced multiple carrier unlock                      | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM647 | Carrier       | OC3, DS1 IMA, DS1, DS0, carrier online                                      | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM648 | Carrier       | OC3, DS1 IMA, DS1, DS0, multiple carrier online                             | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |
|                | MGEM649 | Carrier       | OC3, DS1 IMA, DS1, DS0, carrier offline                                     | n/a                          | See procedures in MG9000 FCAPS Document Configuration Management section |

|         |               |                                                                                              |     |                                                                          |
|---------|---------------|----------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------|
| MGEM650 | Carrier       | OC3, DS1 IMA, DS1, DS0, multiple carrier offline                                             | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM651 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit lock                                                   | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM652 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit multiple lock                                          | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM653 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit unlock                                                 | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM654 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit multiple unlock                                        | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM655 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit diagnostic check                                       | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM656 | Line Circuit  | WLC, ADSL Data/Line circuit abort diagnostic check                                           | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM657 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit set end to end test port                               | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM658 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit set PAV test port                                      | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM659 | Line Circuit  | WLC, ADSL Data/Line, SAA Line circuit clear test                                             | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM660 | LCI           | Create new LCI user                                                                          | n/a |                                                                          |
| MGEM661 | LCI           | Delete existing LCI user                                                                     | n/a |                                                                          |
| MGEM662 | LCI           | Modify existing LCI user data                                                                | n/a |                                                                          |
| MGEM663 | DS1           | Channelize DS1 carrier                                                                       | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM664 | DS1           | Unchannelize DS1 carrier                                                                     | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM665 | DS1           | Modify DS1 carrier provisioning attributes                                                   | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM666 | DS1           | Synchronize pre-provisioned bundles                                                          | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM667 | DS1           | Assign DS1 card spare                                                                        | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM668 | DS1           | Release DS1 card spare                                                                       | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM669 | DS1           | Revert DS1 card sparing activity                                                             | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM670 | DS1           | Initiate DS1 card sparing activity                                                           | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM671 | DS1           | Add DS1 card to protection group                                                             | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM672 | DS1           | Remove DS1 card from protection group                                                        | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM673 | DS1 DS0       | Provision DS0 bundle on DS1 carrier                                                          | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM674 | DS1 DS0       | Modify DS0 bundle                                                                            | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM675 | DS1 DS0       | Set DS0 bundle circuit identifier                                                            | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM676 | DS1 DS0       | Lock DS0 bundle                                                                              | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM677 | DS1 DS0       | Unlock DS0 bundle                                                                            | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM678 | DS1 DS0       | Delete DS0 bundle                                                                            | n/a | See procedures in MG9000 FCAPS Document Configuration Management section |
| MGEM679 | ABI           | ABI Card Switch Mastership requested                                                         |     |                                                                          |
| MGEM679 |               | getCardType(+ restart requested                                                              |     |                                                                          |
| MGEM679 |               | Frame location update requested                                                              |     |                                                                          |
| MGEM679 |               | getCardType(+ configuration state (Online/Offline/Deprovision/Re-Initialize change requested |     |                                                                          |
| MGEM680 |               |                                                                                              |     |                                                                          |
| MGEM681 | NE            | Provisioning Request                                                                         |     |                                                                          |
| MGEM682 | Carrier - OC3 | Carrier Modification Request                                                                 |     |                                                                          |
| MGEM683 | MG9000 Frame  | Frame Location Update Request                                                                |     |                                                                          |
| MGEM684 | MG9000 HW     | Restart Requested                                                                            |     |                                                                          |
| MGEM685 |               | Audit request for one NE                                                                     |     |                                                                          |
| MGEM686 |               | Software Download Requested-single card type                                                 |     |                                                                          |
| MGEM687 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM688 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM689 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM690 |               | Unused                                                                                       |     |                                                                          |
| MGEM691 |               | Unused                                                                                       |     |                                                                          |
| MGEM692 |               | Unused                                                                                       |     |                                                                          |
| MGEM693 |               | Unused                                                                                       |     |                                                                          |
| MGEM694 |               | Unused                                                                                       |     |                                                                          |
| MGEM695 |               | Unused                                                                                       |     |                                                                          |
| MGEM696 |               | Unused                                                                                       |     |                                                                          |
| MGEM697 |               | Unused                                                                                       |     |                                                                          |
| MGEM698 |               | Unused                                                                                       |     |                                                                          |
| MGEM699 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM700 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM701 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM702 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM703 |               | (See Event LOGs)                                                                             |     |                                                                          |
| MGEM704 |               | Delete NE request                                                                            |     |                                                                          |
| MGEM705 |               | Force Deprovision                                                                            |     |                                                                          |
| MGEM706 |               | Provision/Create a DFAD Tap                                                                  |     |                                                                          |
| MGEM707 |               | Deprovision/Delete a DFAD Tap                                                                |     |                                                                          |
| MGEM708 |               | Start & Stop - Sync Backup                                                                   |     |                                                                          |
| MGEM709 |               | Provision/Create an MTAP request                                                             |     |                                                                          |
| MGEM710 |               | Deprovision/Delete an MTAP request                                                           |     |                                                                          |
| MGEM711 |               | Upgrade VMG requested                                                                        |     |                                                                          |
| MGEM712 |               | Submit a request for audit                                                                   |     |                                                                          |
| MGEM713 |               | Discovery request                                                                            |     |                                                                          |
| MGEM714 |               | Upgrade Request                                                                              |     |                                                                          |

## Appendix F: CICM Logs and Alarms for SN08

The following table is the list of events that can be generated by the SAM21 blade-based CICM product in SN08. Some notes on the table's contents at the time of writing:

- The CICM353 log events are unique to the SAM16-based CICM product and are not contained in the table below.
- The CICM328 log (WindowsRestart alarm) has no identified clear in the table below. The WindowsRestart alarm occurs when CICM restarts. When the CICM application comes up, there is a cold start trap generated which is not documented in the table below. It may be possible to use this event as a "clear" for WindowsRestart.
- Items highlighted in bold are changes one can expect from the previous release.

### CICM Logs and Alarms in SN08

| Log            | CICM Log Output Path         | Alarm                                                               | Log Severity | Category       | Description                  | Specific Problem                                                    |
|----------------|------------------------------|---------------------------------------------------------------------|--------------|----------------|------------------------------|---------------------------------------------------------------------|
| CICM300        | Legacy Error Log.            | Log details: XXX                                                    | None         | environmental  | Legacy Error Log.            | Log details: XXX                                                    |
| CICM300        | Legacy Warning Log.          | Log details: XXX                                                    | None         | environmental  | Legacy Warning Log.          | Log details: XXX                                                    |
| CICM301        | Software Version Mismatch.   | Version Mismatch. Local Version XXX. Mate Version XXX.              | Minor        | environmental  | Software Version Mismatch.   | Version Mismatch. Local Version XXX. Mate Version XXX.              |
| CICM301        | Software Version Mismatch.   | Version Mismatch. Local Version XXX. Mate Version XXX.              | None         | environmental  | Software Version Mismatch.   | Version Mismatch. Local Version XXX. Mate Version XXX.              |
| CICM302        | Route/element state mismatch | Resetting adapter, state=XXX mate=XXX                               | None         | communications | Route/element state mismatch | Resetting adapter, state=XXX mate=XXX                               |
| <b>CICM303</b> | Corrupt VLCM.                | VLCM name XXX is corrupt - in memory gateway already has id of XXX. | <b>None</b>  | equipment      | Corrupt VLCM.                | VLCM name XXX is corrupt - in memory gateway already has id of XXX. |
| CICM304        | Unable to bind IP.           | Unable to bind IP adress XXX to interface XXX.                      | None         | communications | Unable to bind IP.           | Unable to bind IP adress XXX to interface XXX.                      |

|         |                           |                                                                          |      |                 |                           |                                                                          |
|---------|---------------------------|--------------------------------------------------------------------------|------|-----------------|---------------------------|--------------------------------------------------------------------------|
| CICM305 | Unable To Bind Adapter.   | Unable to obtain dynamic adapter config from Mib - cannot bind adapter.  | None | processingError | Unable To Bind Adapter.   | Unable to obtain dynamic adapter config from Mib - cannot bind adapter.  |
| CICM306 | No admin Ip for node A.   | No admin address datafilled for node A                                   | None | processingError | No admin Ip for node A.   | No admin address datafilled for node A                                   |
| CICM306 | No admin Ip for node B.   | No admin address datafilled for node B                                   | None | processingError | No admin Ip for node B.   | No admin address datafilled for node B                                   |
| CICM306 | No admin net mask.        | No admin net mask datafilled                                             | None | processingError | No admin net mask.        | No admin net mask datafilled                                             |
| CICM306 | Invalid admin address.    | Invalid admin ip address specified XXX                                   | None | processingError | Invalid admin address.    | Invalid admin ip address specified XXX                                   |
| CICM306 | Invalid admin mask.       | Invalid admin mask specified XXX                                         | None | processingError | Invalid admin mask.       | Invalid admin mask specified XXX                                         |
| CICM307 | Skipping disabled adapter | Skipping disabled XXX adapter.                                           | None | communications  | Skipping disabled adapter | Skipping disabled XXX adapter.                                           |
| CICM308 | UFTPSession Timeout.      | Timed out after XXX secs - No request details received from client       | None | communications  | UFTPSessionTimeout.       | Timed out after XXX secs - No request details received from client       |
| CICM308 | UFTPSession Timeout.      | Timed out after XXX secs - No response from client                       | None | communications  | UFTPSessionTimeout.       | Timed out after XXX secs - No response from client                       |
| CICM308 | UFTPSession Timeout.      | Timed out after XXX secs - Terminated after error occurred               | None | communications  | UFTPSessionTimeout.       | Timed out after XXX secs - Terminated after error occurred               |
| CICM309 | NoStreamsAvailable.       | No streams available for CreateConnection, XXX streams already allocated | None | communications  | NoStreamsAvailable.       | No streams available for CreateConnection, XXX streams already allocated |

|         |                                    |                                                                                                                                             |          |                 |                                    |                                                                                                                                             |
|---------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| CICM310 | H248 Send Port Not Found in MIB.   | XXX : H248 send port not found in MIB.Defaulting to XXX                                                                                     | None     | communications  | H248 Send Port Not Found in MIB.   | XXX : H248 send port not found in MIB.Defaulting to XXX                                                                                     |
| CICM310 | H248 Listen Port Not Found in MIB. | XXX : H248 listen port not found in MIB.Defaulting to XXX                                                                                   | None     | communications  | H248 Listen Port Not Found in MIB. | XXX : H248 listen port not found in MIB.Defaulting to XXX                                                                                   |
| CICM311 | Could not open registry key.       | Could not open XXX in registry. New hierarchy needs to be created. This event can be generated during initial configuration of the gateway. | None     | processingError | Could not open registry key.       | Could not open XXX in registry. New hierarchy needs to be created. This event can be generated during initial configuration of the gateway. |
| CICM311 | Mib failed to open key.            | Mib node error: failed to open key XXX.                                                                                                     | None     | processingError | Mib failed to open key.            | Mib node error: failed to open key XXX.                                                                                                     |
| CICM312 | MIB compatibility failure.         | MIB compatability failure. Could not find the MIB entries for release XXX                                                                   | None     | processingError | MIB compatibility failure.         | MIB compatability failure. Could not find the MIB entries for release XXX                                                                   |
| CICM312 | MIB compatibility remote failure.  | MIB compatability failure. Could not find the MIB entries for release XXX on remote node                                                    | None     | processingError | MIB compatibility remote failure.  | MIB compatability failure. Could not find the MIB entries for release XXX on remote node                                                    |
| CICM313 | GWC Connection Loss                | CICM has lost connection with the GWC                                                                                                       | Critical | communications  | GWC Connection Loss                | CICM has lost connection with the GWC                                                                                                       |
| CICM313 | GWC Connection Loss                | CICM has regained connection with GWC                                                                                                       | None     | communications  | GWC Connection Loss                | CICM has regained connection with GWC                                                                                                       |
| CICM314 | Mib Registry Read Failure.         | Mib registry error: failed to read attribute XXX in key XXX. Probable cause is out of date config data.                                     | None     | processingError | Mib Registry Read Failure.         | Mib registry error: failed to read attribute XXX in key XXX. Probable cause is out of date config data.                                     |



|         |                                    |                                                       |          |                 |                                    |                                                       |
|---------|------------------------------------|-------------------------------------------------------|----------|-----------------|------------------------------------|-------------------------------------------------------|
| CICM316 | Unable to create a socket.         | Unable to create a socket. Error = XXX                | None     | communications  | Unable to create a socket.         | Unable to create a socket. Error = XXX                |
| CICM316 | Unable to Bind Socket to IP.       | Unable to Bind Socket to IP address.                  | None     | communications  | Unable to Bind Socket to IP.       | Unable to Bind Socket to IP address.                  |
| CICM316 | Addr not available.                | Specified address is not available on the local host. | None     | communications  | Addr not available.                | Specified address is not available on the local host. |
| CICM316 | Addr already in use.               | Specified address is already in use.                  | None     | communications  | Addr already in use.               | Specified address is already in use.                  |
| CICM316 | No async read mode                 | Unable to select asynchronous read mode. Error = XXX  | None     | communications  | No async read mode                 | Unable to select asynchronous read mode. Error = XXX  |
| CICM316 | Error setting socket tmo           | Error setting socket timeout. Error = XXX             | None     | communications  | Error setting socket tmo           | Error setting socket timeout. Error = XXX             |
| CICM322 | System Shutdown                    | System is shutting down due to user command.          | Critical | processingError | System Shutdown                    | System is shutting down due to user command.          |
| CICM322 | System Shutdown                    | System is starting up.                                | None     | processingError | System Shutdown                    | System is starting up.                                |
| CICM323 | Slave adapter received no packets  | Slave adapter XXX received no packets                 | None     | communications  | Slave adapter received no packets  | Slave adapter XXX received no packets                 |
| CICM324 | Fatal Error in state               | Fatal error in state XXX.                             | None     | equipment       | Fatal Error in state               | Fatal error in state XXX.                             |
| CICM325 | Element Not Configured.            | Element XXX is not configured.                        | None     | processingError | Element Not Configured.            | Element XXX is not configured.                        |
| CICM325 | Config data missing.               | Configuration data missing, service cannot start.     | None     | processingError | Config data missing.               | Configuration data missing, service cannot start.     |
| CICM326 | Unable to get physical link status | Unable to get physical link status for device XXX     | None     | communications  | Unable to get physical link status | Unable to get physical link status for device XXX     |

|         |                                 |                                                                               |          |                |                                 |                                                                               |
|---------|---------------------------------|-------------------------------------------------------------------------------|----------|----------------|---------------------------------|-------------------------------------------------------------------------------|
| CICM327 | Failed to start network status  | Failed to start network status object, hr=0x XXX                              | None     | equipment      | Failed to start network status  | Failed to start network status object, hr=0x XXX                              |
| CICM328 | Windows restart                 | Auto reboot on failure is set. Initiating windows restart.                    | Critical | equipment      | Windows restart                 | Auto reboot on failure is set. Initiating windows restart.                    |
| CICM329 | Audit Mate Node Down            | Node initialisation: mate node is down                                        | None     | equipment      | Audit Mate Node Down            | Node initialisation: mate node is down                                        |
| CICM329 | Audit Mate Node Down            | Node initialisation: mate node is active in state XXX                         | None     | equipment      | Audit Mate Node Down            | Node initialisation: mate node is active in state XXX                         |
| CICM330 | Can't do physical check on link | Can't do physical check on link XXX                                           | None     | communications | Can't do physical check on link | Can't do physical check on link XXX                                           |
| CICM331 | Component failure : shutdown    | Component XXX has failed. Initiating shutdown. XXX                            | None     | equipment      | Component failure : shutdown    | Component XXX has failed. Initiating shutdown. XXX                            |
| CICM332 | Bad transition on mate node     | Bad transition on mate node from XXX to XXX                                   | None     | equipment      | Bad transition on mate node     | Bad transition on mate node from XXX to XXX                                   |
| CICM333 | No access to remote name        | No access to the remote name in the MIB.                                      | None     | communications | No access to remote name        | No access to the remote name in the MIB.                                      |
| CICM334 | Audit: Mate Node Failed         | Mate node failed - Broadcast failure and ask components to promote to Master. | None     | equipment      | Audit: Mate Node Failed         | Mate node failed - Broadcast failure and ask components to promote to Master. |
| CICM334 | Audit: Mate Node Failed         | Mate node recovered.                                                          | None     | equipment      | Audit: Mate Node Failed         | Mate node recovered.                                                          |
| CICM335 | Route Element Invalid           | Local route element XXX or remote route element XXX is invalid                | None     | communications | Route Element Invalid           | Local route element XXX or remote route element XXX is invalid                |

|         |                                              |                                                                                       |       |                 |                                              |                                                                                       |
|---------|----------------------------------------------|---------------------------------------------------------------------------------------|-------|-----------------|----------------------------------------------|---------------------------------------------------------------------------------------|
| CICM336 | Network loss and recovery                    | Network has been lost and then recovered, mate (slave) must reboot.                   | None  | communications  | Network loss and recovery                    | Network has been lost and then recovered, mate (slave) must reboot.                   |
| CICM337 | Message To Node A Failed                     | Failed to send message to Node A.                                                     | Major | equipment       | Message To Node A Failed                     | Failed to send message to Node A.                                                     |
| CICM337 | Message To Node A Failed                     | Clear Failed to send message to Node A.                                               | None  | equipment       | Message To Node A Failed                     | Clear Failed to send message to Node A.                                               |
| CICM338 | Network Element Failed                       | Network Element XXX Failed                                                            | None  | communications  | Network Element Failed                       | Network Element XXX Failed                                                            |
| CICM339 | No Message Received From B                   | Have not received a message from Node B for 1.5*ALARM_POLL_PERIOD Seconds. XXX        | Major | equipment       | No Message Received From B                   | Have not received a message from Node B for 1.5*ALARM_POLL_PERIOD Seconds. XXX        |
| CICM339 | No Message Received From B                   | Clear: Have not received a message from Node B for 1.5*ALARM_POLL_PERIOD Seconds. XXX | None  | equipment       | No Message Received From B                   | Clear: Have not received a message from Node B for 1.5*ALARM_POLL_PERIOD Seconds. XXX |
| CICM340 | Can't set local adapter                      | Can't set local adapter, invalid adapter specified                                    | None  | communications  | Can't set local adapter                      | Can't set local adapter, invalid adapter specified                                    |
| CICM341 | Backup Fail.                                 | Scheduled/on-demand backup failed during last iteration.                              | Minor | processingError | Backup Fail.                                 | Scheduled/on-demand backup failed during last iteration.                              |
| CICM341 | Backup Fail.                                 | Scheduled/on-demand backup failed during last iteration.                              | None  | processingError | Backup Fail.                                 | Scheduled/on-demand backup failed during last iteration.                              |
| CICM342 | Unable to bind admin IP address to interface | Unable to bind admin IP address to interface XXX - will continue to attempt to bind   | None  | communications  | Unable to bind admin IP address to interface | Unable to bind admin IP address to interface XXX - will continue to attempt to bind   |

|         |                                         |                                                                |       |                |                                     |                                                                   |
|---------|-----------------------------------------|----------------------------------------------------------------|-------|----------------|-------------------------------------|-------------------------------------------------------------------|
| CICM344 | Can't set slave adapter                 | Can't set slave adapter, invalid adapter specified XXX         | None  | communications | Can't set slave adapter             | Can't set slave adapter, invalid adapter specified XXX            |
| CICM345 | EM MAt e Down                           | Mate node down. Name: XXX. XXX                                 | None  | communications | EM MAt e Down                       | Mate node down. Name: XXX. XXX                                    |
| CICM346 | EM Mate Down                            | Couldn't write EM remote node status to Mib                    | None  | communications | EM Mate Down                        | Couldn't write EM remote node status to Mib                       |
| CICM348 | Changing slave adapter                  | Changing slave adapter from XXX to XXX                         | None  | communications | Changing slave adapter              | Changing slave adapter from XXX to XXX                            |
| CICM350 | Get Interface Device Mapping Failed     | Get Interface Device Mapping Failed                            | None  | communications | Get Interface Device Mapping Failed | Get Interface Device Mapping Failed                               |
| CICM352 | Can't map adapter                       | Can't map XXX to an NT device, link state won't be checked     | None  | communications | Can't map adapter                   | Can't map XXX to an NT device, link state won't be checked        |
| CICM354 | maxRudpSessionsNotPresent.              | Maximum sessions configuration not present                     | None  | equipment      | Not Enough Fans                     | Number of Running Fans = XXX. Must have at least XXX running fans |
| CICM354 | UnableToSetMaxRUDPSessions.             | unable to set max RUDP sessions [may already be started]       | Major | equipment      | Fan Cooling Problem                 | Fan XXX has a cooling problem.                                    |
| CICM355 | Bind UDP socket for vmg failed.         | Failed to start UDP socket. hr XXX                             | None  | equipment      | Fan Cooling Problem                 | Clear fan XXX has a cooling problem.                              |
| CICM355 | VMG termination invalid.                | VMG XXX termination XXX invalid                                | Minor | equipment      | CPU A High Temp                     | CPU A has a high temperature of XXX                               |
| CICM356 | Adapter down                            | Adapter XXX is down - aborting start until all adapters are up | None  | equipment      | CPU A High Temp                     | Clearing CPU A has a high temperature. Temperature is now XXX     |
| CICM357 | EchoServerPortNotPresent.               | Echo server port configuration not present                     | Minor | equipment      | CPU B High Temp                     | CPU B has a high temperature of XXX                               |
| CICM358 | Unable to map ne to an interface number | Unable to map ne XXX to an interface number                    | None  | equipment      | CPU B High Temp                     | Clearing CPU B has a high temperature. Temperature is now XXX     |

|         |                              |                                                                                  |       |                |                                         |                                                                |
|---------|------------------------------|----------------------------------------------------------------------------------|-------|----------------|-----------------------------------------|----------------------------------------------------------------|
| CICM359 | Mate Node COM Failure.       | COM method failed to mate node (XXX).                                            | None  | communications | maxRudpSessionsNotPresent.              | Maximum sessions configuration not present                     |
| CICM359 | Mate Node COM Failure.       | COM method succeeded to mate node.                                               | None  | communications | UnableToSetMaxRUDP Sessions.            | unable to set max RUDP sessions [may already be started]       |
| CICM360 | Auto-bind adapter problem    | Auto-bind adapter XXX XXX                                                        | None  | communications | Bind UDP socket for vmg failed.         | Failed to start UDP socket. hr XXX                             |
| CICM361 | HostPortNotPresent.          | Host port configuration not present                                              | None  | communications | VMG termination invalid.                | VMG XXX termination XXX invalid                                |
| CICM362 | Swact request rejected       | Swact request rejected XXX                                                       | None  | communications | Adapter down                            | Adapter XXX is down - aborting start until all adapters are up |
| CICM363 | Create ConnectionAck Failed. | CreateConnectionAck::can't determine destination for message                     | None  | communications | EchoServerPortNotPresent.               | Echo server port configuration not present                     |
| CICM363 | Modify ConnectionAck Failed. | ModifyConnectionAck::can't determine destination for message                     | None  | communications | Unable to map ne to an interface number | Unable to map ne XXX to an interface number                    |
| CICM363 | Set ConnectionAck Failed.    | SetConnNetModeAck::can't determine destination for message                       | Major | communications | Mate Node COM Failure.                  | COM method failed to mate node (XXX).                          |
| CICM363 | no ptime can be negotiated.  | Ensure a common ptime exists between the GWC and the CICM terminal audio profile | None  | communications | Mate Node COM Failure.                  | COM method succeeded to mate node.                             |
| CICM363 | no codec can be negotiated.  | Ensure a common codec exists between the GWC and the CICM terminal audio profile | None  | communications | Auto-bind adapter problem               | Auto-bind adapter XXX XXX                                      |
| CICM364 | Register Gateway Failed      | Register Gateway XXX Failed                                                      | None  | communications | HostPortNotPresent.                     | Host port configuration not present                            |
| CICM364 | UnRegister Gateway Failed    | UnRegister Gateway XXX Failed                                                    | None  | communications | Swact request rejected                  | Swact request rejected XXX                                     |

|         |                                  |                                                                                           |      |                |                              |                                                                                           |
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| CICM365 | Mib Sync Mate Failure            | Mate node failed during MIB synchronisation. This node will start partially Synchronised. | None | communications | Create ConnectionAck Failed. | CreateConnectionAck::can't determine destination for message                              |
| CICM366 | Mib Sync SCM Poll Failure        | Opening Service Control Manager FAILURE.                                                  | None | communications | Modify ConnectionAck Failed. | ModifyConnectionAck::can't determine destination for message                              |
| CICM367 | Error Datafilling Tones          | Error encountered datafilling tones!.                                                     | None | communications | Set ConnectionAck Failed.    | SetConnNetModeAck::can't determine destination for message                                |
| CICM368 | Max Sessions Not Present         | Invalid config. Max Sessions not present.                                                 | None | communications | no ptime can be negotiated.  | Ensure a common ptime exists between the GWC and the CICM terminal audio profile          |
| CICM368 | MaxSessionsNotPresent.           | Maximum sessions configuration not specified                                              | None | communications | no codec can be negotiated.  | Ensure a common codec exists between the GWC and the CICM terminal audio profile          |
| CICM369 | No Domain License                | No network domain license for terminal at XXX                                             | None | communications | Register Gateway Failed      | Register Gateway XXX Failed                                                               |
| CICM370 | Mate Failure.                    | Admin reports mate node failure.                                                          | None | communications | UnRegister Gateway Failed    | UnRegister Gateway XXX Failed                                                             |
| CICM370 | Mate Failure.                    | Admin reports Mate Node start.                                                            | None | equipment      | Mib Sync Mate Failure        | Mate node failed during MIB synchronisation. This node will start partially Synchronised. |
| CICM371 | An Error Occured on the Terminal | Terminal Error XXX                                                                        | None | equipment      | Mib Sync SCM Poll Failure    | Opening Service Control Manager FAILURE.                                                  |
| CICM372 | Unable to map adapter            | Unable to map XXX adapter XXX to an ip address.                                           | None | equipment      | Error Datafilling Tones      | Error encountered datafilling tones!.                                                     |
| CICM373 | UFTPFWarFileOpenFailed.          | Failed to open file XXX.                                                                  | None | equipment      | Max Sessions Not Present     | Invalid config. Max Sessions not present.                                                 |
| CICM373 | UFTPFWarFileOpenFailed.          | Invalid directory or file XXX not found                                                   | None | communications | MaxSessionsNotPresent.       | Maximum sessions configuration not specified                                              |

|         |                                   |                                                                           |       |                |                                   |                                                                |
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| CICM373 | UFTP Firmware File Read Error.    | Firmware file XXX read error                                              | None  | equipment      | No Domain License                 | No network domain license for terminal at XXX                  |
| CICM373 | UFTP Command File Read Error.     | UFTP Command File Read Error                                              | Major | communications | Mate Failure.                     | Admin reports mate node failure.                               |
| CICM373 | UFTP Command File Creation Error. | Command = XXX                                                             | Major | communications | Mate Failure.                     | Admin reports Mate Node start.                                 |
| CICM373 | UFTP Base Directory Missing.      | UFTP base directory missing from registry                                 | None  | equipment      | An Error Occured on the Terminal  | Terminal Error XXX                                             |
| CICM374 | Poll Period Read Fail             | Couldn't read gwPollPeriod from mib. Defaulting to 30 seconds.            | None  | communications | Unable to map adapter             | Unable to map XXX adapter XXX to an ip address.                |
| CICM375 | SAM21 Version Mismatch.           | SAM21 Version Mismatch. Version XXX                                       | None  | communications | UFTP Firmware File Open Failed.   | Failed to open file XXX.                                       |
| CICM375 | SAM21 Version Mismatch.           | SAM21 Version Mismatch. Version XXX                                       | None  | communications | UFTP Firmware File Open Failed.   | Invalid directory or file XXX not found                        |
| CICM376 | Shutting Down Terminals.          | Shutdown counter set to zero minutes, shutting down terminals immediately | None  | communications | UFTP Firmware File Read Error.    | Firmware file XXX read error                                   |
| CICM376 | Terminal Shutdown Aborted.        | Terminal shutdown aborted                                                 | None  | communications | UFTP Command File Read Error.     | UFTP Command File Read Error                                   |
| CICM377 | Syslog Failure.                   | Syslog failure. Last stream in failure XXX.                               | None  | communications | UFTP Command File Creation Error. | Command = XXX                                                  |
| CICM377 | Syslog Failure.                   | Syslog failure clear.                                                     | None  | communications | UFTP Base Directory Missing.      | UFTP base directory missing from registry                      |
| CICM378 | Excessive Nodes on EM             | More than 100 nodes present, unrecommended configuration                  | None  | communications | Poll Period Read Fail             | Couldn't read gwPollPeriod from mib. Defaulting to 30 seconds. |

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| CICM379 | Register Session Failed    | Register Session Failed on Gateway XXX                      | Minor | processingError | SAM21 Version Mismatch.    | SAM21 Version Mismatch. Version XXX                                       |
| CICM379 | Register Gateway Failed    | Register Gateway XXX Failed termination XXX is out of range | None  | processingError | SAM21 Version Mismatch.    | SAM21 Version Mismatch. Version XXX                                       |
| CICM379 | Register Gateway Failed    | Register Gateway XXX Failed termination XXX is invalid      | None  | communications  | ShuttingDownTerminals.     | Shutdown counter set to zero minutes, shutting down terminals immediately |
| CICM379 | Couldn't start audit timer | Couldn't start audit timer                                  | None  | communications  | TerminalShutDownAborted.   | Terminal shutdown aborted                                                 |
| CICM380 | Fail Poll MG               | Failed to Poll Media Gateway XXX.                           | Major | communications  | Syslog Failure.            | Syslog failure. Last stream in failure XXX.                               |
| CICM380 | Fail Poll MG               | Failed to Poll Media Gateway XXX.                           | None  | communications  | Syslog Failure.            | Syslog failure clear.                                                     |
| CICM381 | Network Loss.              | Critical network connection loss on adapter XXX             | None  | communications  | Excessive Nodes on EM      | More than 100 nodes present, unrecommended configuration                  |
| CICM381 | Network Loss.              | Critical network connection loss cleared on adapter XXX     | None  | communications  | Register Session Failed    | Register Session Failed on Gateway XXX                                    |
| CICM381 | Network Loss.              | Major network connection loss on adapter XXX                | None  | communications  | Register Gateway Failed    | Register Gateway XXX Failed termination XXX is out of range               |
| CICM381 | Network Loss.              | Major network connection loss cleared on adapter XXX        | None  | communications  | Register Gateway Failed    | Register Gateway XXX Failed termination XXX is invalid                    |
| CICM381 | Network Redundancy Loss.   | Network redundancy lost to the mate node                    | None  | communications  | Couldn't start audit timer | Couldn't start audit timer                                                |
| CICM381 | Network Redundancy Loss.   | Network redundancy restored to the mate node                | None  | communications  | Fail Poll MG               | Failed to Poll Media Gateway XXX.                                         |



|         |                                                         |                                                                   |          |                |                                                         |                                                                   |
|---------|---------------------------------------------------------|-------------------------------------------------------------------|----------|----------------|---------------------------------------------------------|-------------------------------------------------------------------|
| CICM382 | Remote Host Fail.                                       | Disabling client XXX with interface XXX.                          | None     | communications | Fail Poll MG                                            | Failed to Poll Media Gateway XXX.                                 |
| CICM382 | Remote Host Fail.                                       | Enabling client XXX with interface XXX.                           | Critical | communications | Network Loss.                                           | Critical network connection loss on adapter XXX                   |
| CICM383 | FirmwareUpgradeNotSupportedUFTPOverUnistim.             | Firmware upgrade is not supported via UFTP over Unistim. File XXX | None     | communications | Network Loss.                                           | Critical network connection loss cleared on adapter XXX           |
| CICM383 | Firmware upgrade failure.                               | Firmware upgrade failure.                                         | Major    | communications | Network Loss.                                           | Major network connection loss on adapter XXX                      |
| CICM383 | Firmware upgrade failure.                               | Firmware upgrade failure.                                         | None     | communications | Network Loss.                                           | Major network connection loss cleared on adapter XXX              |
| CICM384 | Node Isolated - Forcing transition from master to slave | Node Isolated - Forcing transition from master to slave           | Major    | communications | Network Redundancy Loss.                                | Network redundancy lost to the mate node                          |
| CICM385 | Slave Node isolated                                     | Slave Node isolated                                               | None     | communications | Network Redundancy Loss.                                | Network redundancy restored to the mate node                      |
| CICM386 | UFTPmaxSessions value in the mib is incorrect           | UFTPmaxSessions must be at least one. Value XXX is invalid        | Minor    | communications | Remote Host Fail.                                       | Disabling client XXX with interface XXX.                          |
| CICM386 | UFTPmaxSessions value is missing from the mib           | UFTPmaxSessions missing using default value XXX                   | None     | communications | Remote Host Fail.                                       | Enabling client XXX with interface XXX.                           |
| CICM387 | CICM Poll Failed                                        | Failed to Poll CICM Node XXX.                                     | None     | communications | FirmwareUpgradeNotSupportedUFTPOverUnistim.             | Firmware upgrade is not supported via UFTP over Unistim. File XXX |
| CICM387 | CICM Poll Failed                                        | Failed to Poll CICM Node XXX.                                     | None     | communications | Firmware upgrade failure.                               | Firmware upgrade failure.                                         |
| CICM388 | UFTPtimerTimeout value is missing from the mib          | UFTPtimerTimeout missing using default value XXX                  | None     | communications | Firmware upgrade failure.                               | Firmware upgrade failure.                                         |
| CICM389 | UFTP_INVALID_CLIENT_MESSAGE                             | UFTP_INVALID_CLIENT_MESSAGE XXX value XXX is invalid              | None     | communications | Node Isolated - Forcing transition from master to slave | Node Isolated - Forcing transition from master to slave           |

|         |                                                          |                                                                    |       |                |                                                |                                                                    |
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| CICM390 | Failed To Connect PAM server                             | PAM server XXX is not responding to authentication requests        | None  | communications | Slave Node isolated                            | Slave Node isolated                                                |
| CICM390 | Failed To Connect PAM server                             | PAM server XXX is now responding to authentication requests        | None  | communications | UFTPmaxSessions value in the mib is incorrect  | UFTPmaxSessions must be at least one. Value XXX is invalid         |
| CICM391 | Invalid transition                                       | ProcessNetworkStateTransition() called with invalid transition XXX | None  | communications | UFTPmaxSessions value is missing from the mib  | UFTPmaxSessions missing using default value XXX                    |
| CICM392 | PAM Server TMO                                           | Timeout occurred whilst awaiting response from PAM server XXX      | Major | communications | CICM Poll Failed                               | Failed to Poll CICM Node XXX.                                      |
| CICM393 | Takeover manual aborted, is not implemented              | Takeover manual aborted, is not implemented                        | None  | communications | CICM Poll Failed                               | Failed to Poll CICM Node XXX.                                      |
| CICM394 | Fatal error: Unable to unbind adapter                    | Fatal error: Unable to unbind adapter.                             | None  | communications | UFTPtimerTimeout value is missing from the mib | UFTPtimerTimeout missing using default value XXX                   |
| CICM395 | Mate node failed temporarily                             | Mate node failed temporarily for XXX iterations                    | None  | communications | UFTP_INVALID_CLIENT_MESSAGE                    | UFTP_INVALID_CLIENT_MESSAGE XXX value XXX is invalid               |
| CICM396 | <b>Takeover aborted, reverting to Master</b>             | <b>Takeover aborted, reverting to Master</b>                       | Major | communications | Failed To Connect PAM server                   | PAM server XXX is not responding to authentication requests        |
| CICM397 | Mate node lost - Forcing transition from slave to master | Mate node lost - Forcing transition from slave to master           | None  | communications | Failed To Connect PAM server                   | PAM server XXX is now responding to authentication requests        |
| CICM398 | Mate node lost                                           | Mate node lost                                                     | None  | communications | Invalid transition                             | ProcessNetworkStateTransition() called with invalid transition XXX |
| CICM399 | Route map error                                          | Resetting adapter, state=XXX mate=XXX                              | None  | communications | PAM Server TMO                                 | Timeout occurred whilst awaiting response from PAM server XXX      |

|         |                                                                  |                                                                  |      |                 |                                                                  |                                                                  |
|---------|------------------------------------------------------------------|------------------------------------------------------------------|------|-----------------|------------------------------------------------------------------|------------------------------------------------------------------|
| CICM500 | State Change.                                                    | Admin reports a state change to XXX for component XXX.           | None | communications  | Takeover manual aborted, is not implemented                      | Takeover manual aborted, is not implemented                      |
| CICM503 | Network Access State Change                                      | Network access state change to XXX                               | None | communications  | Fatal error: Unable to unbind adapter                            | Fatal error: Unable to unbind adapter.                           |
| CICM504 | EM Network State Change                                          | Network connectivity XXX. hr=XXX                                 | None | communications  | Mate node failed temporarily                                     | Mate node failed temporarily for XXX iterations                  |
| CICM505 | Stop Monitoring                                                  | Stopped monitoring node XXX                                      | None | communications  | <b>Takeover aborted, reverting to Master</b>                     | <b>Takeover aborted, reverting to Master</b>                     |
| CICM506 | Start Monitoring                                                 | Started to monitor node XXX.                                     | None | communications  | Mate node lost - Forcing transition from slave to master         | Mate node lost - Forcing transition from slave to master         |
| CICM507 | Connect to PAM.                                                  | Connect to PAM.                                                  | None | communications  | Mate node lost                                                   | Mate node lost                                                   |
| CICM508 | Slave instructed to change to invalid adapter, selecting default | Slave instructed to change to invalid adapter, selecting default | None | communications  | Route map error                                                  | Resetting adapter, state=XXX mate=XXX                            |
| CICM509 | Critical Process State Change.                                   | Critical Process XXX is not running.                             | None | processingError | State Change.                                                    | Admin reports a state change to XXX for component XXX.           |
| CICM509 | Critical Process State Change.                                   | Critical Process XXX is running.                                 | None | communications  | Network Access State Change                                      | Network access state change to XXX                               |
| CICM509 | Service State Change.                                            | Service XXX is not running.                                      | None | communications  | EM Network State Change                                          | Network connectivity XXX. hr=XXX                                 |
| CICM509 | Service State Change.                                            | Service XXX is running.                                          | None | communications  | Stop Monitoring                                                  | Stopped monitoring node XXX                                      |
| CICM510 | EM Mate Up.                                                      | EM Mate Up. Name: XXX.                                           | None | communications  | Start Monitoring                                                 | Started to monitor node XXX.                                     |
| CICM512 | Start SWACT.                                                     | Admin reports a request to start SWACT.                          | None | environmental   | Connect to PAM.                                                  | Connect to PAM.                                                  |
| CICM512 | Promote to Master.                                               | Admin reports a request to promote to Master.                    | None | communications  | Slave instructed to change to invalid adapter, selecting default | Slave instructed to change to invalid adapter, selecting default |

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| CICM512 | Demote to Slave.               | Admin reports a request to demote to slave.                          | Critical | processingError | Critical Process State Change. | Critical Process XXX is not running.                    |
| CICM513 | Changing local adapter         | Changing local adapter from XXX to XXX                               | None     | processingError | Critical Process State Change. | Critical Process XXX is running.                        |
| CICM603 | Invalid Event Report.          | Invalid report received from Admin.                                  | Major    | processingError | Service State Change.          | Service XXX is not running.                             |
| CICM604 | Mate sync error state.         | request for mate synchronisation received in state XXX.              | None     | processingError | Service State Change.          | Service XXX is running.                                 |
| CICM605 | GW Reg in Bad State.           | Gateway registration received in state XXX.                          | None     | environmental   | EM Mate Up.                    | EM Mate Up. Name: XXX.                                  |
| CICM606 | Premature reg slave gw.        | Premature registration of the slave gateway.                         | None     | processingError | Start SWACT.                   | Admin reports a request to start SWACT.                 |
| CICM607 | Swact Request from Remote MGM. | Swact request received from the remote MGM.                          | None     | processingError | Promote to Master.             | Admin reports a request to promote to Master.           |
| CICM608 | Retransmitted RUDP messages.   | Retransmitted XXX RUDP messages, XXX retransmissions were throttled. | None     | processingError | Demote to Slave.               | Admin reports a request to demote to slave.             |
| CICM609 | Retransmitted RUDP messages.   | Retransmitted XXX RUDP messages.                                     | None     | communications  | Changing local adapter         | Changing local adapter from XXX to XXX                  |
| CICM610 | Loss of logs.                  | XXX logs have been lost due to buffering.                            | None     | processingError | Invalid Event Report.          | Invalid report received from Admin.                     |
| CICM610 | Loss of traps.                 | XXX traps have been lost due to buffering.                           | None     | processingError | Mate sync error state.         | request for mate synchronisation received in state XXX. |
| CICM611 | Resource Threshold Crossed     | Resource XXX is near or above its threshold of XXX                   | None     | equipment       | GW Reg in Bad State.           | Gateway registration received in state XXX.             |

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| CICM611 | Threshold Crossed              | Resource XXX is near or above its threshold value of XXX                   | None  | equipment        | Premature reg slave gw.        | Premature registration of the slave gateway.                         |
| CICM612 | Start Audit.                   | Starting the daily audit.                                                  | None  | equipment        | Swact Request from Remote MGM. | Swact request received from the remote MGM.                          |
| CICM612 | Audit Complete                 | Daily audit completed.                                                     | None  | communications   | Retransmitted RUDP messages.   | Retransmitted XXX RUDP messages, XXX retransmissions were throttled. |
| CICM614 | Message from invalid component | Message received from invalid component type = 0x XXX                      | None  | communications   | Retransmitted RUDP messages.   | Retransmitted XXX RUDP messages.                                     |
| CICM615 | Node forced to master          | Node is being forced to become master.                                     | None  | communications   | Loss of logs.                  | XXX logs have been lost due to buffering.                            |
| CICM615 | Node forced to slave           | Node is being forced to become slave.                                      | None  | communications   | Loss of traps.                 | XXX traps have been lost due to buffering.                           |
| CICM617 | Mib Sync Poll Failure          | Network status remote state query returned hr=0x XXX.                      | Major | qualityOfService | Resource Threshold Crossed     | Resource XXX is near or above its threshold of XXX                   |
| CICM618 | No Line ID                     | User XXX has no Lineld attribute in the mib.                               | None  | qualityOfService | Threshold Crossed              | Resource XXX is near or above its threshold value of XXX             |
| CICM619 | No Toneset Found               | Toneset XXX not found A standard tone will be used in place of all toneIDs | None  | environmental    | Start Audit.                   | Starting the daily audit.                                            |
| CICM620 | Invalid Tone Component Index   | Invalid tone component index toneset XXX toneid                            | None  | environmental    | Audit Complete                 | Daily audit completed.                                               |
| CICM621 | Invalid Volume Datafilled      | No volume datafilled for toneset XXX toneid XXX                            | None  | equipment        | Message from invalid component | Message received from invalid component type = 0x XXX                |
| CICM622 | Invalid Tone Frequency         | Invalid tone frequency count toneset XXX toneid XXX                        | None  | equipment        | Node forced to master          | Node is being forced to become master.                               |

|         |                                                |                                                                                                |      |           |                              |                                                                            |
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| CICM623 | Invalid Frequency Datafilled                   | No frequency datafilled for toneset XXX toneid XXX                                             | None | equipment | Node forced to slave         | Node is being forced to become slave.                                      |
| CICM624 | Invalid Cadence Count                          | Invalid tone cadence count toneset XXX toneid XXX                                              | None | equipment | Mib Sync Poll Failure        | Network status remote state query returned hr=0x XXX.                      |
| CICM625 | No Cadence Off                                 | No Cadence off datafilled for toneset XXX toneid XXX                                           | None | equipment | No Line ID                   | User XXX has no Lineid attribute in the mib.                               |
| CICM625 | No Cadence On                                  | No Cadence on datafilled for toneset XXX toneid XXX                                            | None | equipment | No Toneset Found             | Toneset XXX not found A standard tone will be used in place of all toneIDs |
| CICM627 | Connection mapped to invalid line              | Connection XXX is mapped to line XXX which isn't valid.                                        | None | equipment | Invalid Tone Component Index | Invalid tone component index toneset XXX toneid XXX                        |
| CICM628 | Connection mapped not in E1_CONN state         | Connection XXX is mapped to line XXX which isn't in E1_CONNECTI ON state.                      | None | equipment | Invalid Volume Datafilled    | No volume datafilled for toneset XXX toneid XXX                            |
| CICM629 | Reset Connection isn't in NO_CONNEC TION state | Resetting connection for line XXX which isn't in NO_CONNECT ION state.                         | None | equipment | Invalid Tone Frequency       | Invalid tone frequency count toneset XXX toneid XXX                        |
| CICM630 | Create Connection Fail                         | Create connection failed. Call type = XXX, result = XXX                                        | None | equipment | Invalid Frequency Datafilled | No frequency datafilled for toneset XXX toneid XXX                         |
| CICM631 | Delete Connection Fail                         | Delete connection failed.                                                                      | None | equipment | Invalid Cadence Count        | Invalid tone cadence count toneset XXX toneid XXX                          |
| CICM632 | No line object                                 | Create Connection: Could not find line object for conflicting connection XXX with lineid = XXX | None | equipment | No Cadence Off               | No Cadence off datafilled for toneset XXX toneid XXX                       |

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| CICM633 | Corrupt Connection Map  | Connection map is corrupt, or media control is reusing handles, connection id XXX is already in use my lineid XXX. | None | equipment | No Cadence On                                 | No Cadence on datafilled for toneset XXX toneid XXX                                                                |
| CICM634 | No Connection Id map    | Connection map is corrupt, or media control is reusing handles, connection id XXX could not be found in the map.   | None | equipment | Connection mapped to invalid line             | Connection XXX is mapped to line XXX which isn't valid.                                                            |
| CICM635 | Unable Change Rx Loss   | Unable to change rx loss for connection XXX                                                                        | None | equipment | Connection mapped not in E1_CONN state        | Connection XXX is mapped to line XXX which isn't in E1_CONNECTION state.                                           |
| CICM636 | Too Many Features       | Terminal type has too many features on the main set (max is XXX).                                                  | None | equipment | Reset Connection isn't in NO_CONNECTION state | Resetting connection for line XXX which isn't in NO_CONNECTION state.                                              |
| CICM637 | Too Many Features       | Terminal type has too many features on the extension set (max is XXX).                                             | None | equipment | Create Connection Fail                        | Create connection failed. Call type = XXX, result = XXX                                                            |
| CICM638 | Auth User Failed        | User XXX                                                                                                           | None | equipment | Delete Connection Fail                        | Delete connection failed.                                                                                          |
| CICM639 | Logout Success          | User XXX                                                                                                           | None | equipment | No line object                                | Create Connection: Could not find line object for conflicting connection XXX with lineid = XXX                     |
| CICM639 | Login Success           | User XXX                                                                                                           | None | equipment | Corrupt Connection Map                        | Connection map is corrupt, or media control is reusing handles, connection id XXX is already in use my lineid XXX. |
| CICM641 | Change Password Attempt | User XXX                                                                                                           | None | equipment | No Connection Id map                          | Connection map is corrupt, or media control is reusing handles, connection id XXX could not be found in the map.   |

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| CICM642 | Release Authentication            |                                                     | None | equipment | Unable Change Rx Loss         | Unable to change rx loss for connection XXX                            |
| CICM643 | Invalid Firmware Protocol         | Invalid FirmwareProtocol for TerminalType= XXX      | None | equipment | Too Many Features             | Terminal type has too many features on the main set (max is XXX).      |
| CICM644 | Invalid Firmware Level            | Invalid Firmware level for TerminalType= XXX        | None | equipment | Too Many Features             | Terminal type has too many features on the extension set (max is XXX). |
| CICM645 | No Firmware Level                 | Terminal has no firmware level recorded in the MIB  | None | equipment | Auth User Failed              | User XXX                                                               |
| CICM646 | Invalid UFTP Host                 | Invalid UFTP host port                              | None | equipment | Logout Success                | User XXX                                                               |
| CICM647 | Invalid Unistim Host              | Invalid Unistim host address                        | None | equipment | Login Success                 | User XXX                                                               |
| CICM648 | Invalid Firmware TFPT Address     | Invalid Firmware TFTP Address for TerminalType= XXX | None | equipment | Change Password Attempt       | User XXX                                                               |
| CICM649 | Config Data Change.               | Admin reports a configuration data change.          | None | equipment | Release Authentication        |                                                                        |
| CICM650 | Initialising as master            | Initialising as master                              | None | equipment | Invalid Firmware Protocol     | Invalid FirmwareProtocol for TerminalType= XXX                         |
| CICM650 | Initialising as master (no slave) | Initialising as master (no slave)                   | None | equipment | Invalid Firmware Level        | Invalid Firmware level for TerminalType= XXX                           |
| CICM650 | Initialising as slave             | Initialising as slave                               | None | equipment | No Firmware Level             | Terminal has no firmware level recorded in the MIB                     |
| CICM650 | Starting takeover                 | Starting takeover                                   | None | equipment | Invalid UFTP Host             | Invalid UFTP host port                                                 |
| CICM650 | Takeover succeeded, now slave     | Takeover succeeded, now slave                       | None | equipment | Invalid Unistim Host          | Invalid Unistim host address                                           |
| CICM650 | Takeover succeeded, now Master    | Takeover succeeded, now Master                      | None | equipment | Invalid Firmware TFPT Address | Invalid Firmware TFTP Address for TerminalType=XXX                     |



|         |                                                               |                                                               |      |                 |                                                               |                                                               |
|---------|---------------------------------------------------------------|---------------------------------------------------------------|------|-----------------|---------------------------------------------------------------|---------------------------------------------------------------|
| CICM650 | Forcing transition from slave to master                       | Forcing transition from slave to master                       | None | processingError | Config Data Change.                                           | Admin reports a configuration data change.                    |
| CICM650 | Forcing transition from master to slave                       | Forcing transition from master to slave                       | None | communications  | Initialising as master                                        | Initialising as master                                        |
| CICM650 | Mate Node Recovered - Forcing transition from slave to master | Mate Node Recovered - Forcing transition from slave to master | None | communications  | Initialising as master (no slave)                             | Initialising as master (no slave)                             |
| CICM650 | Processing Swact                                              | Processing Swact request                                      | None | communications  | Initialising as slave                                         | Initialising as slave                                         |
| CICM652 | Adding a gateway                                              | Gateway XXX has been added.                                   | None | communications  | Starting takeover                                             | Starting takeover                                             |
| CICM653 | Deleting a gateway                                            | Deleting gateway XXX                                          | None | communications  | Takeover succeeded, now slave                                 | Takeover succeeded, now slave                                 |
| CICM654 | Adding a profile                                              | Adding a XXX profile for gateway XXX                          | None | communications  | Takeover succeeded, now Master                                | Takeover succeeded, now Master                                |
| CICM655 | Deleting a profile                                            | Deleting XXX profile for gateway XXX                          | None | communications  | Forcing transition from slave to master                       | Forcing transition from slave to master                       |
| CICM656 | Max Rx Rate Exceeded.                                         | Max rx rate of XXX has been exceeded by rate XXX.             | None | communications  | Forcing transition from master to slave                       | Forcing transition from master to slave                       |
| CICM656 | Max Rx Rate Exceeded.                                         | Clear max rx rate of XXX has been exceeded.                   | None | communications  | Mate Node Recovered - Forcing transition from slave to master | Mate Node Recovered - Forcing transition from slave to master |
| CICM657 | Max Creation Attempts.                                        | Reached the max creation attempts for the session.            | None | communications  | Processing Swact                                              | Processing Swact request                                      |
| CICM657 | Max Creation Attempts.                                        | Reached the max creation attempts for the session.            | None | communications  | Adding a gateway                                              | Gateway XXX has been added.                                   |
| CICM658 | Mate node recovered                                           | Mate node recovered                                           | None | communications  | Deleting a gateway                                            | Deleting gateway XXX                                          |
| CICM659 | Slave adapter recovered                                       | Slave adapter XXX recovered                                   | None | communications  | Adding a profile                                              | Adding a XXX profile for gateway XXX                          |

|         |                                         |                                                                   |       |                 |                                |                                                    |
|---------|-----------------------------------------|-------------------------------------------------------------------|-------|-----------------|--------------------------------|----------------------------------------------------|
| CICM660 | Successful PAM Authentication.          | User XXX has started a session on the CICM-EM                     | None  | communications  | Deleting a profile             | Deleting XXX profile for gateway XXX               |
| CICM661 | PAM Authentication Failure.             | User XXX authentication failure                                   | Minor | processingError | Max Rx Rate Exceeded.          | Max rx rate of XXX has been exceeded by rate XXX.  |
| CICM662 | User Privileges Revoked.                | Privileges revoked                                                | None  | processingError | Max Rx Rate Exceeded.          | Clear max rx rate of XXX has been exceeded.        |
| CICM663 | User Privileges upgraded.               | Privileges upgraded                                               | Minor | communications  | Max Creation Attempts.         | Reached the max creation attempts for the session. |
| CICM664 | Inactive User Timeout.                  | User XXX is no longer active on the CICM-EM                       | None  | communications  | Max Creation Attempts.         | Reached the max creation attempts for the session. |
| CICM665 | Network Element recovered               | Network Element XXX recovered                                     | None  | communications  | Mate node recovered            | Mate node recovered                                |
| CICM668 | Reached the maximum number of sessions. | Current number of active sessions has reached the maximum of XXX. | None  | communications  | Slave adapter recovered        | Slave adapter XXX recovered                        |
| CICM668 | Reached the maximum number of sessions. | Current number of active sessions is below the maximum of XXX.    | None  | environmental   | Successful PAM Authentication. | User XXX has started a session on the CICM-EM      |
| CICM680 | Register Gateway Succeeded              | Register Gateway XXX Succeeded                                    | None  | processingError | PAM Authentication Failure.    | User XXX authentication failure                    |
| CICM681 | Configuration change                    | XXX                                                               | None  | environmental   | User Privileges Revoked.       | Privileges revoked                                 |
| CICM682 | Provisioning change                     | XXX                                                               | None  | environmental   | User Privileges upgraded.      | Privileges upgraded                                |
| CICM749 | Account Disabled                        | User XXX                                                          | None  | environmental   | Inactive User Timeout.         | User XXX is no longer active on the CICM-EM        |
| CICM750 | Change Password Attempt                 | User XXX                                                          | None  | communications  | Network Element recovered      | Network Element XXX recovered                      |

|         |                            |                                                                                               |          |                 |                                         |                                                                   |
|---------|----------------------------|-----------------------------------------------------------------------------------------------|----------|-----------------|-----------------------------------------|-------------------------------------------------------------------|
| CICM801 | BHHCA Minor Alarm          | BHHCA is close to maximum value.                                                              | Critical | equipment       | Node B in Critical Alarm state          | Node B in Critical Alarm state                                    |
| CICM801 | BHHCA Minor Alarm          | BHHCA is close to maximum value.                                                              | None     | equipment       | Node B in Critical Alarm state          | Node B in Critical Alarm state                                    |
| CICM802 | BHHCA Major Alarm          | BHHCA is at Maximum Limit. Calls may not succeed.                                             | Major    | equipment       | Node B in Major Alarm state             | Node B in Major Alarm state                                       |
| CICM802 | BHHCA Major Alarm          | BHHCA is at Maximum Limit. Calls may not succeed.                                             | None     | equipment       | Node B in Major Alarm state             | Node B in Major Alarm state                                       |
| CICM803 | BHHCA Critical Alarm       | BHHCA is well above Maximum Limit. Calls will be Throttled.                                   | Minor    | equipment       | Node B in Minor Alarm state             | Node B in Minor Alarm state                                       |
| CICM803 | BHHCA Critical Alarm       | BHHCA is well above Maximum Limit. Calls will be Throttled.                                   | None     | equipment       | Node B in Minor Alarm state             | Node B in Minor Alarm state                                       |
| CICM804 | Registry Flush Minor Alarm | Registry has not been flushed for 1 hour. Registry data could be lost if power outage occurs. | None     | processingError | Reached the maximum number of sessions. | Current number of active sessions has reached the maximum of XXX. |
| CICM804 | Registry Flush Minor Alarm | Registry has not been flushed for 1 hour. Registry data could be lost if power outage occurs. | None     | processingError | Reached the maximum number of sessions. | Current number of active sessions is below the maximum of XXX.    |
| CICM680 | /var/log/auditlog          | RegisterGatewaySucceeded                                                                      | None     | communications  | Register Gateway Succeeded              | Register Gateway XXX Succeeded                                    |
| CICM681 | /var/log/auditlog          | ConfigurationChange                                                                           | None     | communications  | Configuration change                    | XXX                                                               |

|         |                      |                         |          |                  |                            |                                                                                               |
|---------|----------------------|-------------------------|----------|------------------|----------------------------|-----------------------------------------------------------------------------------------------|
| CICM682 | /var/log/auditlog    | ProvisioningChange      | None     | communications   | Provisioning change        | XXX                                                                                           |
| CICM749 | /var/log/securitylog | AccountDisabled         | None     | equipment        | Account Disabled           | User XXX                                                                                      |
| CICM750 | /var/log/securitylog | ChangePasswordFail      | None     | equipment        | Change Password Attempt    | User XXX                                                                                      |
| CICM801 | Alarm_Trap_tto_IEMS  | bhhcaMinorAlarm         | Minor    | qualityOfService | BHHCA Minor Alarm          | BHHCA is close to maximum value.                                                              |
| CICM801 | Alarm_Trap_tto_IEMS  | bhhcaMinorAlarmClear    | None     | qualityOfService | BHHCA Minor Alarm          | BHHCA is close to maximum value.                                                              |
| CICM802 | Alarm_Trap_tto_IEMS  | bhhcaMajorAlarm         | Major    | qualityOfService | BHHCA Major Alarm          | BHHCA is at Maximum Limit. Calls may not succeed.                                             |
| CICM802 | Alarm_Trap_tto_IEMS  | bhhcaMajorAlarmClear    | None     | qualityOfService | BHHCA Major Alarm          | BHHCA is at Maximum Limit. Calls may not succeed.                                             |
| CICM803 | Alarm_Trap_tto_IEMS  | bhhcaCriticalAlarm      | Critical | qualityOfService | BHHCA Critical Alarm       | BHHCA is well above Maximum Limit. Calls will be Throttled.                                   |
| CICM803 | Alarm_Trap_tto_IEMS  | bhhcaCriticalAlarmClear | None     | qualityOfService | BHHCA Critical Alarm       | BHHCA is well above Maximum Limit. Calls will be Throttled.                                   |
| CICM804 | Alarm_Trap_tto_IEMS  | registryFlushAlarm      | Minor    | equipment        | Registry Flush Minor Alarm | Registry has not been flushed for 1 hour. Registry data could be lost if power outage occurs. |
| CICM804 | Alarm_Trap_tto_IEMS  | registryFlushAlarmClear | None     | equipment        | Registry Flush Minor Alarm | Registry has not been flushed for 1 hour. Registry data could be lost if power outage occurs. |



## Appendix G: Ethernet Routing Switch 8600 Trap List and Trap Raise/Clear Mapping

### Trap List

```
<?xml version="1.0" encoding="ISO88591" ?>
<!--
severity = 6|5|4|3|2|1
    Critical = 1
    Major = 2
    Minor = 3
    Warning = 4
    Clear = 5
    Info = 6

-->
<TRAPS>
  <TRAP oid=".1.3.6.1.2.1.16.0.1" name="risingAlarm">
    <PROPERTIES>
      <eventprop name="severity" value="3" />
      <eventprop name="logName" value="PP" />
      <eventprop name="logNumber" value="310" />
      <eventprop name="eventType" value="TBL" />
      <eventprop name="eventLabel" value="PP Fault" />
      <eventprop name="category" value="qualityOfService" />
      <eventprop name="entity" value="$ip_alarmStatus_$1" />
      <eventprop name="componentID" value="PP8600 = $ip; alarmIndex=$1" />
      <eventprop name="alarmClear" value="3" />
      <eventprop name="probableCause" value="Threshold crossed." />
      <eventprop name="description" value="Threshold Crossed: alarmIndex= $1(
        Threshold= $2 alarmValue= $3)" />
      <eventprop name="specificProblem" value="Rising threshold crossed" />
    </PROPERTIES>
    <VARBINDS>
      <varbind name=".1.3.6.1.2.1.16.3.1.1.1" property="$1" />
      <varbind name=".1.3.6.1.2.1.16.3.1.1.7" property="$2" />
      <varbind name=".1.3.6.1.2.1.16.3.1.1.5" property="$3" />
    </VARBINDS>
  </TRAP>
```

```

    <TRAP oid=".1.3.6.1.2.1.16.0.2" name="fallingAlarm">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="311" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_alarmStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; alarmIndex=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Threshold crossed" />
  <eventprop name="description" value="Threshold Crossed: alarmIndex = $1( Threshold = $2
alarmValue = $3)" />
  <eventprop name="specificProblem" value="Falling threshold crossed" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.2.1.16.3.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.2.1.16.3.1.1.8" property="$2" />
  <varbind name=".1.3.6.1.2.1.16.3.1.1.5" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.6.3.1.1.5.1.0" name="coldStart">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="313" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="operator" />
  <eventprop name="entity" value="$ip_coldStart" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Agent reinitialized itself with default settings" />
  <eventprop name="description" value="A coldStart trap signifies that the snmp agent is
reinitializing itself with default settings." />
  <eventprop name="specificProblem" value="Agent reinitialized itself with default settings" />
</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.6.3.1.1.5.2.0" name="warmStart">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="315" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="operator" />
  <eventprop name="entity" value="$ip_warmstart" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Agent reinitialized itself with its configuration
unaltered." />
  <eventprop name="description" value="A warmStart trap signifies that the SNMPv2 agent is
reinitializing itself such that its configuration is unaltered." />
  <eventprop name="specificProblem" value="Agent reinitialized itself with its configuration
unaltered." />
</PROPERTIES>
</TRAP>

```

```

<TRAP oid=".1.3.6.1.6.3.1.1.5.3.0" name="linkDown">
<PROPERTIES>
  <eventprop name="severity" value="2" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="317" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_linkDown_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; ifIndex=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="loss of communication" />
  <eventprop name="description" value="Link Down: ifIndex = $1( AdminStatus = $2
OperationStatus = $3)" />
  <eventprop name="specificProblem" value="Generic Link Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.2.1.2.2.1.1" property="$1" />
  <varbind name=".1.3.6.1.2.1.2.2.1.7" property="$2" />
  <varbind name=".1.3.6.1.2.1.2.2.1.8" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.6.3.1.1.5.4.0" name="linkUp">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="318" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_linkUp_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; ifIndex=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="communication regained" />
  <eventprop name="description" value="Link Up: ifIndex = $1( AdminStatus = $2
OperationStatus = $3)" />
  <eventprop name="specificProblem" value="Generic Link Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.2.1.2.2.1.1" property="$1" />
  <varbind name=".1.3.6.1.2.1.2.2.1.7" property="$2" />
  <varbind name=".1.3.6.1.2.1.2.2.1.8" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.6.3.1.1.5.5.0" name="authenticationFailure">
<PROPERTIES>
  <eventprop name="severity" value="4" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="319" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="security" />
  <eventprop name="entity" value="$ip_authenticationFailure" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="6" />
  <eventprop name="probableCause" value="Authentication failure" />
  <eventprop name="description" value="Authentication failure occurred" />
  <eventprop name="specificProblem" value="Authentication failure" />

```

```

</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.6" name="rcnChasPowerSupplyDown">
<PROPERTIES>
  <eventprop name="severity" value="1" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="322" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rcnSupplyStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; SupplyId=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Power Supply down" />
  <eventprop name="description" value="Power Supply Status: SupplyId = $1( OperationStatus =
$2 )" />
  <eventprop name="specificProblem" value="Power Supply Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.6" name="rcChasPowerSupplyDown">
<PROPERTIES>
  <eventprop name="severity" value="1" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="322" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rcSupplyStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; SupplyId=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Power supply down" />
  <eventprop name="description" value="Power Supply Status: SupplyId = $1( OperationStatus =
$2 )" />
  <eventprop name="specificProblem" value="Power Supply Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.14" name="rcChasPowerSupplyUp">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="323" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rcSupplyStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; SupplyId=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Power supply up" />
  <eventprop name="description" value="Power Supply Status: SupplyId = $1( OperationStatus =
$2 )" />

```



```

<eventprop name="specificProblem" value="Power Supply Status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.14" name="rcnChasPowerSupplyUp">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="323" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcnSupplyStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; SupplyId=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Power supply up" />
<eventprop name="description" value="Power Supply Status: SupplyId = $1( OperationStatus =
$2 )" />
<eventprop name="specificProblem" value="Power Supply Status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.8.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.7" name="rcnChasFanDown">
<PROPERTIES>
<eventprop name="severity" value="1" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="324" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcnFanStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; fanId=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Fan status down" />
<eventprop name="description" value="Fan Down: fanId= $1( OperationStatus = $2 )" />
<eventprop name="specificProblem" value="Fan down" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.7" name="rcChasFanDown">
<PROPERTIES>
<eventprop name="severity" value="1" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="324" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcFanStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; fanId=$1" />

```

```
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Fan Status Down" />
<eventprop name="description" value="Fan Down: fanId= $1( OperationStatus = $2 )" />
<eventprop name="specificProblem" value="Fan down" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.21" name="rcnChasFanUp">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="325" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcnFanStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; fanId=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Fan Status Up" />
<eventprop name="description" value="Fan Up: fanId= $1( OperationStatus = $2 )" />
<eventprop name="specificProblem" value="Fan Up" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.21" name="rcChasFanUp">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="325" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcFanStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; fanId=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Fan Status Up" />
<eventprop name="description" value="Fan Up: fanId= $1( OperationStatus = $2 )" />
<eventprop name="specificProblem" value="Fan Up" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.7.1.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.11" name="rcn2kCardDown">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="326" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
```

```

    <eventprop name="entity" value="$ip_rcn2KCardStatus_$1" />
    <eventprop name="componentID" value="PP8600 = $ip; cardIndex=$1" />
    <eventprop name="alarmClear" value="3" />
    <eventprop name="probableCause" value="Rc 2k Card Down" />
    <eventprop name="description" value="Card Down: cardIndex = $1( AdminStatus = $2
OperationStatus = $3)" />
    <eventprop name="specificProblem" value="RC 2k Card Status" />
  </PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.11" name="rc2kCardDown">
  <PROPERTIES>
    <eventprop name="severity" value="2" />
    <eventprop name="logName" value="PP" />
    <eventprop name="logNumber" value="326" />
    <eventprop name="eventType" value="TBL" />
    <eventprop name="eventLabel" value="PP Fault" />
    <eventprop name="category" value="equipment" />
    <eventprop name="entity" value="$ip_rc2KCardStatus_$1" />
    <eventprop name="componentID" value="PP8600 = $ip; cardIndex=$1" />
    <eventprop name="alarmClear" value="3" />
    <eventprop name="probableCause" value="Rc 2k Card Down" />
    <eventprop name="description" value="Card Down: cardIndex = $1( AdminStatus = $2
OperationStatus = $3)" />
    <eventprop name="specificProblem" value="RC 2k Card Status" />
  </PROPERTIES>
  <VARBINDS>
    <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
    <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
    <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
  </VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.12" name="rcn2kCardUp">
  <PROPERTIES>
    <eventprop name="severity" value="5" />
    <eventprop name="logName" value="PP" />
    <eventprop name="logNumber" value="327" />
    <eventprop name="eventType" value="Clear" />
    <eventprop name="eventLabel" value="PP Fault" />
    <eventprop name="category" value="equipment" />
    <eventprop name="entity" value="$ip_rcn2KCardStatus_$1" />
    <eventprop name="componentID" value="PP8600 = $ip; cardIndex=$1" />
    <eventprop name="alarmClear" value="3" />
    <eventprop name="probableCause" value="Card status Up" />
    <eventprop name="description" value="Card Up: cardIndex = $1( AdminStatus = $2
OperationStatus = $3)" />
    <eventprop name="specificProblem" value="RC 2k Card Status" />
  </PROPERTIES>
  <VARBINDS>
    <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
    <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
    <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
  </VARBINDS>
</TRAP>

```

```

<TRAP oid=".1.3.6.1.4.1.2272.1.21.12" name="rc2kCardUp">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="327" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rc2KCardStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; cardIndex=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Card Up" />
  <eventprop name="description" value="Card Up: cardIndex = $1( AdminStatus = $2
OperationStatus = $3)" />
  <eventprop name="specificProblem" value="RC 2K Card Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.13" name="rcn2kTemperature">
<PROPERTIES>
  <eventprop name="severity" value="1" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="328" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rcn2kTemperature" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Overheating of the chassis detected" />
  <eventprop name="description" value="Chassis overheating: rc2kChassisTemperature = $1" />
  <eventprop name="specificProblem" value="RC 2K Chassis Temperature" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.100.1.2" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.3" name="rcnErrorNotification">
<PROPERTIES>
  <eventprop name="severity" value="$1" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="329" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="unknown" />
  <eventprop name="entity" value="$ip_ErrorNotification" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Error condition occurred" />
  <eventprop name="description" value="Error occurred: Error Level = $1( Error Code = $2 Error
Text = $3)" />
  <eventprop name="specificProblem" value="RC 2K Error" />
</PROPERTIES>
<VARBINDS>

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```
<varbind name=".1.3.6.1.4.1.2272.1.20.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.20.2" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.20.3" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.8" name="rcnLinkOscillation">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="330" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_linkOscillation_$1" />
<eventprop name="componentID" value="PP8600 = $ip; portIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Link Oscillation detected" />
<eventprop name="description" value="LinkOscillation: portIndex = $1" />
<eventprop name="specificProblem" value="RC Link Oscillation" />
</PROPERTIES>
</VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.9" name="rcnMacViolation">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="331" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_MacViolation_$1" />
<eventprop name="componentID" value="PP8600 = $ip; portIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="RC Mac Violation" />
<eventprop name="description" value="RC Mac Violation: portIndex= $1( rcErrorText = $2)" />
<eventprop name="specificProblem" value="RC Mac violation" />
</PROPERTIES>
</VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.20.3" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.10" name="rcnSonetTrap">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="332" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_SonetTrap_$1" />
<eventprop name="componentID" value="PP8600 = $ip; portIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Sonet port status change" />
<eventprop name="description" value="Sonet Trap: portIndex = $1( TrapType = $2
TrapIndication = $3)" />
```

```
<eventprop name="specificProblem" value="Sonet port status change" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.26.5.1" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.26.5.2" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.4" name="rcnStpNewRoot">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="333" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_StpNewRoot_$1" />
<eventprop name="componentID" value="PP8600 = $ip; stgId=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Stp New Root" />
<eventprop name="description" value="Stp New Root: stgId = $1" />
<eventprop name="specificProblem" value="Stp New Root" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.13.4.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.5" name="rcnStpTopologyChange">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="334" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_StpTopoChange_$1" />
<eventprop name="componentID" value="PP8600 = $ip; stgId=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Stp Topology change" />
<eventprop name="description" value="Stp Topology change: stgId= $1( portIndex = $2)" />
<eventprop name="specificProblem" value="Stp Topology change" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.13.4.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.16" name="rcnStpTCN">
<PROPERTIES>
<eventprop name="severity" value="3" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="335" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_StpTCN_$1" />
<eventprop name="componentID" value="PP8600 = $ip; portIndex =$1" />
<eventprop name="alarmClear" value="3" />
```



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<eventprop name="probableCause" value="Stp TCN" />
<eventprop name="description" value="Stp TCN: portIndex= $1( stgId= $2 BridgeAddress= $3)"
/>
<eventprop name="specificProblem" value="Stp TCN" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.13.4.1.1" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.13.4.1.4" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.15" name="rcn2kAtmPvcLinkStateChange">
<PROPERTIES>
<eventprop name="severity" value="$4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="336" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="environmental" />
<eventprop name="entity" value="$ip_LinkState_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rc2kAtmPvcIfIndex=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="PVC link status change" />
<eventprop name="description" value="Atm Pvc Link State Change: AtmPvcIfIndex = $1(
AtmPvcVpi = $2 AtmPvcVci = $3 AtmPvcOamVcStatus = $4)" />
<eventprop name="specificProblem" value="PVC link status change" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.100.9.3.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.100.9.3.1.2" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.100.9.3.1.3" property="$3" />
<varbind name=".1.3.6.1.4.1.2272.1.100.9.3.1.18" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.17" name="rcnSmlt1stLinkUp">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="337" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_SplitLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="" />
<eventprop name="description" value="Split MLT link status up" />
<eventprop name="specificProblem" value="Split MLT link status up" />
</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.18" name="rcnSmlt1stLinkDown">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="338" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
```

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<eventprop name="entity" value="$ip_SplitLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Split MLT Link Status Down" />
<eventprop name="description" value="Split MLT Link Status Down" />
<eventprop name="specificProblem" value="Split MLT Link Status Down" />
</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.19" name="rcnSmltLinkUp">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="339" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_rcnSmltLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcMltSmltId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Split SMLT link up" />
<eventprop name="description" value="Split SMLT link up: rcMltSmltId = $1" />
<eventprop name="specificProblem" value="Split SMLT Link status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.17.10.1.13" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.19" name="rcSmltLinkUp">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="339" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_rcSmltLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcMltSmltId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Split SMLT link up" />
<eventprop name="description" value="Split SMLT link up: rcMltSmltId = $1" />
<eventprop name="specificProblem" value="Split SMLT Link status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.17.10.1.13" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.20" name="rcnSmltLinkDown">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="340" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_rcnSmltLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcMltSmltId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Split SMLT Link down" />
```



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<eventprop name="description" value="Split SMLT link down: rcMltSmltId = $1" />
<eventprop name="specificProblem" value="Split SMLT link status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.17.10.1.13" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.20" name="rcSmltLinkDown">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="340" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_rcSmltLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcMltSmltId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Split SMLT link down" />
<eventprop name="description" value="Split SMLT link down: rcMltSmltId = $1" />
<eventprop name="specificProblem" value="Split SMLT Link status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.17.10.1.13" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.22" name="rcnPasswordChange">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="341" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="security" />
<eventprop name="entity" value="$ip_CLIPasswordChanged" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="CLI password changed" />
<eventprop name="description" value="CLI password changed ( PasswordChange = $1
PassChangeResult = $2)" />
<eventprop name="specificProblem" value="CLI password has been changed" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.19.17" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.19.18" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.25" name="rcnPcmciaCardRemoved">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="342" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_PCMCIARemoved" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />

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<eventprop name="probableCause" value="PCMCIA card is being removed." />
<eventprop name="description" value="PCMCIA card is being removed." />
<eventprop name="specificProblem" value="PCMCIA card removed." />
</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.26" name="rcnSmartCpldTimerFired">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="343" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_cpldTimerFired_$1" />
<eventprop name="componentID" value="PP8600 = $ip; CardIndex=$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="cpld timer fired" />
<eventprop name="description" value="cpld timer fired: CardIndex = $1" />
<eventprop name="specificProblem" value="cpld timer fired" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.100.6.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.27" name="rcnCardCpldNotUpDate">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="344" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_alarmStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; CardIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="cpld is not up to date" />
<eventprop name="description" value="cpld is not up to date: CardIndex = $1" />
<eventprop name="specificProblem" value="cpld not up to date" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.100.6.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.28" name="rcnlgapLogFileFull">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="345" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="processing" />
<eventprop name="entity" value="$ip_lgapLogFileFull" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="lgap Log file full" />
<eventprop name="description" value="lgap accounting timeout Log File reach the maximum." />
<eventprop name="specificProblem" value="lgap Log file full" />

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</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.29" name="rcnCpLimitShutDown">
<PROPERTIES>
  <eventprop name="severity" value="2" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="346" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_CPLimitShutDown_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; PortIndex=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="cp limit for the port is shutting down" />
  <eventprop name="description" value="Cp limit for port is shutting down: PortIndex= $1(
AdminStatus = $2 OperStatus = $3 CpLimitShutDown = $4)" />
  <eventprop name="specificProblem" value="cp limit for the port is shutting down" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1" property="$1" />
  <varbind name=".1.3.6.1.2.1.2.2.1.7" property="$2" />
  <varbind name=".1.3.6.1.2.1.2.2.1.8" property="$3" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.50" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.30" name="rcnSshServerEnabled">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="347" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_SshServerStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; SshGlobalPort=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="SSH server is enabled" />
  <eventprop name="description" value="SSH server is enabled: SshGlobalPort = $1" />
  <eventprop name="specificProblem" value="SSH server enabled" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.34.1.2" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.31" name="rcnSshServerDisabled">
<PROPERTIES>
  <eventprop name="severity" value="2" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="348" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_SshServerStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; SshGlobalPort=$1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="SSH server is disabled" />
  <eventprop name="description" value="SSH server is disabled: SshGlobalPort = $1" />
  <eventprop name="specificProblem" value="SSH server disabled" />
</PROPERTIES>
```

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</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.34.1.2" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.32" name="rcnSshSessionLogin">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="349" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_SshSessionStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; SshGlobalHostIpAddr =$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="SSH Session login" />
<eventprop name="description" value="SSH session login occurred: SshGlobalHostIpAddr = $1"
/>
<eventprop name="specificProblem" value="SSH Session login" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.34.1.12" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.33" name="rcnSshSessionLogout">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="350" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_SshSessionStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; SshGlobalHostIpAddr =$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="SSH session logout" />
<eventprop name="description" value="SSH session logout occurred: SshGlobalHostIpAddr =
$1" />
<eventprop name="specificProblem" value="SSH session logout" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.34.1.12" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.34" name="rcnSshUnauthorizedAccess">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="351" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="security" />
<eventprop name="entity" value="$ip_SshUnauthorizedAccess_$1" />
<eventprop name="componentID" value="PP8600 = $ip; SshGlobalHostIpAddr =$1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Unauthorized access" />

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<eventprop name="description" value="Unauthorized access occurred: SshGlobalHostIpAddr =
$1" />
<eventprop name="specificProblem" value="Unauthorized access" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.34.1.12" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.35" name="rcnHaCpuState">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="352" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_HaCpuState_$1" />
<eventprop name="componentID" value="PP8600 = $ip; CardIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="State of the HACPU" />
<eventprop name="description" value="State of the HACPU: CardIndex = $1 (HaCpuState =
$2)" />
<eventprop name="specificProblem" value="State of the HACPU" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.100.6.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.32.1" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.36" name="rcnInsufficientMemory">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="353" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="environmental" />
<eventprop name="entity" value="$ip_InsufficientMemory_$1" />
<eventprop name="componentID" value="PP8600 = $ip; CardIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Insufficient memory on CPU blade for proper
operation" />
<eventprop name="description" value="Insufficient memory: CardIndex = $1" />
<eventprop name="specificProblem" value="Insufficient memory on CPU" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.100.6.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.37" name="rcnSaveConfigAction">
<PROPERTIES>
<eventprop name="severity" value="6" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="354" />
<eventprop name="eventType" value="Info" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="processing" />
<eventprop name="entity" value="$ip_SaveConfig" />
```

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<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Switch run time or boot configuration is saved" />
<eventprop name="description" value="Switch configuration saved: SysAction = $1" />
<eventprop name="specificProblem" value="Switch configuration saved" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.1.8" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.38" name="rcnLoopDetectOnPort">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="355" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_LoopOnPort_$1" />
<eventprop name="componentID" value="PP8600 = $ip; PortIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Loop detected on port. The vlan on that port will be
disabled" />
<eventprop name="description" value="Loop detected on port: PortIndex = $1 (rcVlanId = $2)"
/>
<eventprop name="specificProblem" value="Loop detected on port." />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.46.1.3.0.3.0" name="vrrpTrapStateTransition">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="356" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_TrapStateTransition_$1" />
<eventprop name="componentID" value="PP8600 = $ip; ifIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="State transition has occurred on vrrp interface" />
<eventprop name="description" value="State Transition: ifIndex = $1 (TransitionType = $2
TransitionCause = $3)" />
<eventprop name="specificProblem" value="Trap state transition" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.2.2.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.46.1.1.14" property="$2" />
<varbind name=".1.3.6.1.2.1.46.1.1.15" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.23" name="rcnEmError">
<PROPERTIES>
<eventprop name="severity" value="4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="357" />

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<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_EmError_$1" />
<eventprop name="componentID" value="PP8600 = $ip; CardIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Em error detected" />
<eventprop name="description" value="Em error: CardIndex = $1 (Em Error = $2)" />
<eventprop name="specificProblem" value="Em error detected" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.100.6.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.23" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.1" name="ospfVirtIfStateChange">
<PROPERTIES>
<eventprop name="severity" value="$4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="358" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="environmental" />
<eventprop name="entity" value="$ip_IfStateChange_$1" />
<eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="OSPF virtual interface state change" />
<eventprop name="description" value="OSPF virtual interface state change: ospfRouterId = $1
(AreaId = $2 Neighbor = $3 State = $4)" />
<eventprop name="specificProblem" value="OSPF virtual interface state change" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.14.9.1.1" property="$2" />
<varbind name=".1.3.6.1.2.1.14.9.1.2" property="$3" />
<varbind name=".1.3.6.1.2.1.14.9.1.10" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.2" name="ospfNbrStateChange">
<PROPERTIES>
<eventprop name="severity" value="$5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="359" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_NbrStateChange_$1_$4" />
<eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Nonvirtual OSPF neighbor state change" />
<eventprop name="description" value="Nonvirtual OSPF neighbor state change: ospfRouterId
= $1 (NbrIpAddr = $2 )" />
<eventprop name="specificProblem" value="Nonvirtual OSPF neighbor state change" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.14.10.1.1" property="$2" />
</VARBINDS>

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</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.3" name="ospfVirtNbrStateChange">
<PROPERTIES>
  <eventprop name="severity" value="$4" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="360" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="environmental" />
  <eventprop name="entity" value="$ip_VirtNbrStateChange_$1_$3" />
  <eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Virtual OSPF neighbor state change" />
  <eventprop name="description" value="Virtual OSPF neighbor state change: ospfRouterId = $1
(VirtNbrArea = $2 VirtNbrState = $3)" />
  <eventprop name="specificProblem" value="Virtual OSPF neighbor state change" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
  <varbind name=".1.3.6.1.2.1.14.11.1.1" property="$2" />
  <varbind name=".1.3.6.1.2.1.14.11.1.5" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.4" name="ospfIfConfigError">
<PROPERTIES>
  <eventprop name="severity" value="2" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="361" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_IfConfigError" />
  <eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Configuration error" />
  <eventprop name="description" value="IfConfig Error: ospfRouterId = $1 (IpAddress = $2)" />
  <eventprop name="specificProblem" value="configuration error" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
  <varbind name=".1.3.6.1.2.1.14.7.1.1" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.5" name="ospfVirtIfConfigError">
<PROPERTIES>
  <eventprop name="severity" value="2" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="362" />
  <eventprop name="eventType" value="TBL" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_VirtIfConfigError_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="" />
  <eventprop name="description" value="ospfVirtIfConfigError: ospfRouterId = $1 (AreaId = $2
Neighbor = $3 ErrorType = $4 )" />
  <eventprop name="specificProblem" value="" />

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</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.14.9.1.1" property="$2" />
<varbind name=".1.3.6.1.2.1.14.9.1.2" property="$3" />
<varbind name=".1.3.6.1.2.1.14.16.1.2" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.6" name="ospfIfAuthFailure">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="363" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="security" />
<eventprop name="entity" value="$ip_IfAuthFailure_$1" />
<eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="ospf If authentication failure" />
<eventprop name="description" value="ospf If authentication failure: ospfRouterId = $1
(ConfigErrorType =$2)" />
<eventprop name="specificProblem" value="ospf If authentication failure" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.14.16.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.7" name="ospfVirtIfAuthFailure">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="364" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="security" />
<eventprop name="entity" value="$ip_VirtIfAuthFailure_$1" />
<eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="ospf virtual interface authentication failure" />
<eventprop name="description" value="ospfVirtIfAuthFailure: ospfRouterId = $1 (AreaId = $2
Neighbor = $3 ErrorType =$4 )" />
<eventprop name="specificProblem" value="" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.14.9.1.1" property="$2" />
<varbind name=".1.3.6.1.2.1.14.9.1.2" property="$3" />
<varbind name=".1.3.6.1.2.1.14.16.1.2" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.14.16.2.16" name="ospfIfStateChange">
<PROPERTIES>
<eventprop name="severity" value="$4" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="365" />
<eventprop name="eventType" value="TBL" />

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```

<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_ifStateChange_$1_$2" />
<eventprop name="componentID" value="PP8600 = $ip; ospfRouterId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Nonvirtual OSPF interface state change" />
<eventprop name="description" value="Nonvirtual OSPF interface state change: ospfRouterId
= $1 (IpAddress = $2 State = $3)" />
<eventprop name="specificProblem" value="Nonvirtual OSPF interface state change" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.14.1.1" property="$1" />
<varbind name=".1.3.6.1.2.1.14.7.1.1" property="$2" />
<varbind name=".1.3.6.1.2.1.14.7.1.12" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.1" name="rcnCardDown">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="366" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcnCardStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcCardIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="RC Card status down" />
<eventprop name="description" value="RC card status down: CardIndex = $1 (AdminStatus =
$2 OperStatus = $3)" />
<eventprop name="specificProblem" value="RC Card status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.1" name="rcCardDown">
<PROPERTIES>
<eventprop name="severity" value="2" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="366" />
<eventprop name="eventType" value="TBL" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="equipment" />
<eventprop name="entity" value="$ip_rcCardStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcCardIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="RC Card Status down." />
<eventprop name="description" value="RC card status down: CardIndex = $1 (AdminStatus =
$2 OperStatus = $3)" />
<eventprop name="specificProblem" value="RC Card Status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />

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</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.2" name="rcnCardUp">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="367" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rcnCardStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; rcCardIndex = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="RC card status up" />
  <eventprop name="description" value="RC card status up: CardIndex = $1 (AdminStatus = $2
OperStatus = $3)" />
  <eventprop name="specificProblem" value="RC Card Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.2" name="rcCardUp">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="367" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="equipment" />
  <eventprop name="entity" value="$ip_rcCardStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; rcCardIndex = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="RC card status up" />
  <eventprop name="description" value="RC card status up: CardIndex = $1 (AdminStatus = $2
OperStatus = $3)" />
  <eventprop name="specificProblem" value="RC Card Status" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.5" property="$2" />
  <varbind name=".1.3.6.1.4.1.2272.1.4.9.1.1.6" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.39" name="rcnbgpEstablished">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="368" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_bgpEstablished" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="BGP FSM entered the ESTABLISHED state" />

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    <eventprop name="description" value="BGP FSM entered the ESTABLISHED state
(PeerLastError = $1 PeerState = $2)" />
    <eventprop name="specificProblem" value="BGP FSM entered the ESTABLISHED state" />
  </PROPERTIES>
</VARBINDS>
<varbind name=".1.3.6.1.2.1.15.3.1.14" property="$1" />
<varbind name=".1.3.6.1.2.1.15.3.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.40" name="rcnbgpBackwardTransition">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="369" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_bgpBackwardTransition_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; rclpBgpPeerIpAddress = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="BGP FSM backward transition" />
  <eventprop name="description" value="BGP FSM backward transition: PeerIpAddress = $1
(PeerLastError = $2 PeerState = $3)" />
  <eventprop name="specificProblem" value="BGP FSM backward transition" />
</PROPERTIES>
</VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.8.101.9.1.2" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.8.101.9.1.26" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.8.101.9.1.25" property="$3" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.41" name="rcnAggLinkUp">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="370" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_AggLinkStatus_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; rcMltId = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Aggregator up" />
  <eventprop name="description" value="Aggregator up: rcMltId = $1" />
  <eventprop name="specificProblem" value="Aggregator status" />
</PROPERTIES>
</VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.17.10.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.42" name="rcnAggLinkDown">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="371" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />

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<eventprop name="entity" value="$ip_AggLinkStatus_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rcMltId = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Aggregator Down" />
<eventprop name="description" value="Aggregator Down: rcMltId = $1" />
<eventprop name="specificProblem" value="Aggregator status" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.17.10.1.1" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.43" name="rcnlgmpNewGroupMember">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="372" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_GroupMember_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rclgmpGroupIfIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="New Group member in interface" />
<eventprop name="description" value="New Group member in interface: rclgmpGroupIfIndex =
$1 (GroupIpAddress = $2 Port = $3 Members $4)" />
<eventprop name="specificProblem" value="New Group member in interface" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.5" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.1" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.3" property="$3" />
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.2" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.44" name="rcnlgmpLossGroupMember">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="373" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_GroupMember_$1" />
<eventprop name="componentID" value="PP8600 = $ip; rclgmpGroupIfIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Group member lost on interface" />
<eventprop name="description" value="Group member lost on interface: rclgmpGroupIfIndex =
$1 (GroupIpAddress = $2 Port = $3 Members $4)" />
<eventprop name="specificProblem" value="Group member lost on interface" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.5" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.1" property="$2" />
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.3" property="$3" />
<varbind name=".1.3.6.1.4.1.2272.1.8.6.1.2" property="$4" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.45" name="rcnlgmpNewQuerier">

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```

<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="374" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_Querier_$1" />
  <eventprop name="componentID" value="PP8600 = $ip; igmpInterfaceIndex = $1" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="New Querier in interface" />
  <eventprop name="description" value="New Querier in interface: igmpInterfaceIndex = $1
(igmpInterfaceQuerier = $2 )" />
  <eventprop name="specificProblem" value="New Querier in interface" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.3.59.1.1.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.3.59.1.1.1.1.5" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.46" name="rcnIgmpQuerierChange">
  <PROPERTIES>
    <eventprop name="severity" value="5" />
    <eventprop name="logName" value="PP" />
    <eventprop name="logNumber" value="375" />
    <eventprop name="eventType" value="Clear" />
    <eventprop name="eventLabel" value="PP Fault" />
    <eventprop name="category" value="communications" />
    <eventprop name="entity" value="$ip_QuerierChange_$1" />
    <eventprop name="componentID" value="PP8600 = $ip; igmpInterfaceIndex = $1" />
    <eventprop name="alarmClear" value="3" />
    <eventprop name="probableCause" value="Querier changed" />
    <eventprop name="description" value="Querier changed: igmpInterfaceIndex = $1 (
NewQuerier = $2 igmpInterfaceQuerier = $3 )" />
    <eventprop name="specificProblem" value="Querier changed" />
  </PROPERTIES>
  <VARBINDS>
    <varbind name=".1.3.6.1.3.59.1.1.1.1.1" property="$1" />
    <varbind name=".1.3.6.1.4.1.2272.1.30.1.1.25" property="$2" />
    <varbind name=".1.3.6.1.3.59.1.1.1.1.5" property="$3" />
  </VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.47" name="rcnDvmrplfStateChange">
  <PROPERTIES>
    <eventprop name="severity" value="5" />
    <eventprop name="logName" value="PP" />
    <eventprop name="logNumber" value="376" />
    <eventprop name="eventType" value="Clear" />
    <eventprop name="eventLabel" value="PP Fault" />
    <eventprop name="category" value="communications" />
    <eventprop name="entity" value="$ip_DvmrpStateChange_$1" />
    <eventprop name="componentID" value="PP8600 = $ip; dvmrpInterfaceIndex = $1" />
    <eventprop name="alarmClear" value="3" />
    <eventprop name="probableCause" value="DVMRP interface state change" />
    <eventprop name="description" value="DVMRP interface state change: dvmrpInterfaceIndex
= $1 (OperState = $2 )" />
    <eventprop name="specificProblem" value="DVMRP interface state change" />
  </PROPERTIES>

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<VARBINDS>
<varbind name=".1.3.6.1.3.62.1.1.3.1.1" property="$1" />
<varbind name=".1.3.6.1.3.62.1.1.3.1.3" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.48" name="rcnDvmrpNewNbrChange">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="377" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_NbrChange_$1" />
<eventprop name="componentID" value="PP8600 = $ip; dvmrpNeighborIfIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="New neighbor is up on DVMRP interface" />
<eventprop name="description" value="New neighbor is up on DVMRP interface:
dvmrpNeighborIfIndex = $1 (NeighborAddress = $2 )" />
<eventprop name="specificProblem" value="New neighbor is up on DVMRP interface" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.3.62.1.1.4.1.1" property="$1" />
<varbind name=".1.3.6.1.3.62.1.1.4.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.49" name="rcnDvmrpNbrLossChange">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="378" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_NbrChange_$1" />
<eventprop name="componentID" value="PP8600 = $ip; dvmrpNeighborIfIndex = $1" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Neighbor gone down on DVMRP interface" />
<eventprop name="description" value="Neighbor gone down on DVMRP interface:
dvmrpNeighborIfIndex = $1 (NeighborAddress = $2 )" />
<eventprop name="specificProblem" value="Neighbor gone down on DVMRP interface" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.3.62.1.1.4.1.1" property="$1" />
<varbind name=".1.3.6.1.3.62.1.1.4.1.2" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.59" name="rcnFdbProtectViolation">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="379" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_FdbProtect_$1_$2" />
<eventprop name="componentID" value="PP8600 = $ip; PortIndex = $1" />
<eventprop name="alarmClear" value="3" />
```

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    <eventprop name="probableCause" value="fdbentries limit violation" />
    <eventprop name="description" value="fdbentries limit violation: PortIndex = $1 (VlanId = $2 )" />
  />
  <eventprop name="specificProblem" value="fdbentries limit violation" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.4.10.1.1.1" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.3.2.1.1" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.60" name="rcnLogMsgControl">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="380" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_Log" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Log Message control trap" />
  <eventprop name="description" value="rcnLogMsgControl: SysMsgLogFrequency = $1 (SysMsgLogText = $2 )" />
  <eventprop name="specificProblem" value="Log Message control trap" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.1.66" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.1.67" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.61" name="rcnSaveConfigFile">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="381" />
  <eventprop name="eventType" value="Clear" />
  <eventprop name="eventLabel" value="PP Fault" />
  <eventprop name="category" value="communications" />
  <eventprop name="entity" value="$ip_SaveConfig" />
  <eventprop name="componentID" value="PP8600 = $ip" />
  <eventprop name="alarmClear" value="3" />
  <eventprop name="probableCause" value="Run time / boot config saved on switch" />
  <eventprop name="description" value="Config saved on switch: SysAction = $1 (SysConfigFileName = $2 )" />
  <eventprop name="specificProblem" value="Run time / boot config saved on switch" />
</PROPERTIES>
<VARBINDS>
  <varbind name=".1.3.6.1.4.1.2272.1.1.8" property="$1" />
  <varbind name=".1.3.6.1.4.1.2272.1.1.34" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.2272.1.21.0.62" name="rcnDNSRequestResponse">
<PROPERTIES>
  <eventprop name="severity" value="5" />
  <eventprop name="logName" value="PP" />
  <eventprop name="logNumber" value="382" />
  <eventprop name="eventType" value="Clear" />

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<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_DNSResponse" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Request/Response from DNS server" />
<eventprop name="description" value="Request sent to or response got from DNS server:
DnsServerListIpAddr = $1 (DnsRequestType = $2 )" />
<eventprop name="specificProblem" value="Request/Response from DNS server" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.4.1.2272.1.1.71" property="$1" />
<varbind name=".1.3.6.1.4.1.2272.1.1.72" property="$2" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.80.0.1.0" name="pingProbeFailed">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="383" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_ProbeFailed" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Probe failure is detected" />
<eventprop name="description" value="Probe failure is detected: (ping TargetAddress = $1)" />
<eventprop name="specificProblem" value="Probe failure is detected" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.80.1.2.1.4" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.80.0.2.0" name="pingTestFailed">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="384" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_pingTestFail" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Ping test failed" />
<eventprop name="description" value="Ping test failed: (ping TargetAddress = $1)" />
<eventprop name="specificProblem" value="Ping test failed" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.80.1.2.1.4" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.80.0.3.0" name="pingTestCompleted">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="385" />

```

```

<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_pingTestComp" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Ping test completed" />
<eventprop name="description" value="Ping test completed: (ping TargetAddress = $1" />
<eventprop name="specificProblem" value="Ping test completed." />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.80.1.2.1.4" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.81.0.1.0" name="traceRoutePathChange">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="386" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_traceRouteChange" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="The path to a target has changed" />
<eventprop name="description" value="The path to a target has changed: (TargetAddress = $1)" />
<eventprop name="specificProblem" value="The path to a target has changed" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.81.1.2.1.4" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.81.0.2.0" name="traceRouteTestFailed">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="387" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_RouteTestFail" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="Could not determine the path to a target" />
<eventprop name="description" value="Could not determine the path to a target: (TargetAddress = $1)" />
<eventprop name="specificProblem" value="Could not determine the path to a target" />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.81.1.2.1.4" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.2.1.81.0.3.0" name="traceRouteTestCompleted">
<PROPERTIES>
<eventprop name="severity" value="5" />
<eventprop name="logName" value="PP" />

```

```

<eventprop name="logNumber" value="388" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="communications" />
<eventprop name="entity" value="$ip_RouteTestComplete" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="The path to a target has just been determined." />
<eventprop name="description" value="The path to a target has just been determined:
(TargetAddress = $1)" />
<eventprop name="specificProblem" value="The path to a target has just been determined." />
</PROPERTIES>
<VARBINDS>
<varbind name=".1.3.6.1.2.1.81.1.2.1.4" property="$1" />
</VARBINDS>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.562.42.5.1.3.2.2" name="UDPEapSessionEndTrap">
<PROPERTIES>
<eventprop name="severity" value="6" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="389" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_UDPEapSessionEnd" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="" />
<eventprop name="description" value="UDPEapSession end trap" />
<eventprop name="specificProblem" value="" />
</PROPERTIES>
</TRAP>
<TRAP oid=".1.3.6.1.4.1.562.42.5.1.3.2.1" name="UDPEapSessionStartTrap">
<PROPERTIES>
<eventprop name="severity" value="6" />
<eventprop name="logName" value="PP" />
<eventprop name="logNumber" value="390" />
<eventprop name="eventType" value="Clear" />
<eventprop name="eventLabel" value="PP Fault" />
<eventprop name="category" value="unknown" />
<eventprop name="entity" value="$ip_UDPEapSessionSart" />
<eventprop name="componentID" value="PP8600 = $ip" />
<eventprop name="alarmClear" value="3" />
<eventprop name="probableCause" value="" />
<eventprop name="description" value="UDPEapSession start trap" />
<eventprop name="specificProblem" value="" />
</PROPERTIES>
</TRAP>
</TRAPS>

```

## Ethernet Routing Switch 8600 Trap Raise-Clear Mapping

|    | <b>Raise Alarm</b>                                        | <b>Clear Alarm</b>                                    |
|----|-----------------------------------------------------------|-------------------------------------------------------|
| 1  | RisingAlarm(PP310)                                        | FallingAlarm(PP311)                                   |
| 2  | LinkDown (PP317)                                          | LinkUp(PP318)                                         |
| 3  | RcnChasPowerSupplyDown /<br>RcChasPowerSupplyDown (PP322) | RcnChasPowerSupplyUp /<br>RcChasPowerSupplyUp (PP323) |
| 4  | RcnChasFanDown / RcChasFanDown<br>(PP324)                 | RncChasFanUp / RnChasFanUp<br>(PP325)                 |
| 5  | Rcn2kCardDown / Rc2kCardDown<br>(PP326)                   | Rcn2kCardUp / Rc2kCardUp<br>(PP327)                   |
| 6  | RcnSmltIstLinkDown(PP338)                                 | RcnSmltIstLinkUp(PP337)                               |
| 7  | RcnSmltLinkDown /<br>RcSmltLinkDown (PP340)               | RcnSmltLinkUp / RcSmltLinkUp<br>(PP339)               |
| 8  | RcnSshServerDisabled(PP348)                               | RcnSshServerEnabled(PP347)                            |
| 9  | RcnSshSessionLogout(PP350)                                | RcnSshSessionLogin(PP349)                             |
| 10 | RcnCardDown / RcCardDown (PP366)                          | RcnCardUp / RcCardUp (PP367)                          |

## Appendix H: : SNMP-based PM Poller

### Performance Monitoring Poller data collection output

The SNMP-based PM poller collects performance attributes from several network elements (i.e., UAS, GWC, SSPFS platform). The data collected by the PM device pollers is output in CSV files to the '/ data/oms' file output directory. The oms directory contains seven sub- directories (named 1- 7). Each of these sub-directories contains a day's collection of CSV output files (i.e., one sub-directory each for the seven-day history the poller maintains). The current day's output files are always written to subdirectory '1'. File rotation occurs just prior to midnight every 24-hour period. When file rotation occurs, the files in sub-directory '7' are removed and contents of all subsequent sub-directories are moved up the directory chain (i.e., files in directory 6 are moved to directory 7, 5 to 6, etc.).

A separate file is created for each device during each profile polling interval. When creating the CSV files the poller adheres to the following naming conventions:

<NodeType>.<NodeName>.OMs.<Report  
Name>.Year.Mon.Date\_HR.MN\_<TZ>.csv

where:

NodeType -> Node type (i.e, GWC, UAS, etc....)

NodeName -> A unique node name.

Report Name -> For the SSPFS poller this will correlate to the associated profile name.

TZ -> timezone (i.e., cst or cdt)

An example file name is provided below:

GWC.GWC-10\_UNIT\_1.OMs.GWC.2002.05.02\_10.52\_EDT.csv

### Viewing CSV files

The CSV files can be viewed locally on the SSPFS platform by using a standard text editor. Alternately the SSPFS platform is configured with a snmp-poller ftp userid. A craftperson can utilize ftp to retrieve the CSV output data files for further analysis. When the snmp-poller ftp userid is used to ftp into the SSPFS server, the home directory for this account is the file oms output directory. For security reasons the snmp-poller ftp user only has access to the output directory and its sub-directories. Sample output files from the MIB-2 profile is provided in the following table:

Note: A device can reside in more than one profile.

Note: Keep in mind, however, that the CSV file format is not intended to be a user-friendly format for viewing the output in a standard text editor. Typically these files would be parsed by an editor that can format CSV files in a legible manner, or they would be parsed by a machine interface.

Note: The 'poller' ftp userid should be used to retrieve the PM poller output files. Contact your network administrator to obtain the associated password.

| Sample CSV output file for profile MIB-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre>\$cat GWC.GWC6.OMs.MIB-2.2002.05.24_16.06_EDT //MIB-2 - .iso.org.dod.internet.mgmt.mib-2.host.hrSystem SCALAR_GROUP_BEGIN-hrSystemUptime,hrSystemDate,hrSystemPro- cesses,1:2:18:51.85,"2002-5-24,20:7:42.0,+0:0",155 SCALAR_GROUP_END //MIB-2 - .iso.org.dod.internet.mgmt.mib-2.snmp SCALAR_GROUP_BEGIN-snmpInPkts,snmpOutPkts,snmpInBadVer- sions,snmpInBadCommunityNames,snmpInBadCommunityUses,snmpInA SNParseErrs,snmpInTotalReqVars,snmpInTotalSetVars,snmpOut- Traps,snmpSilentDrops,27608,27614,0,0,0,0,103010,772,7,80 SCALAR_GROUP_END //MIB-2 - .iso.org.dod.internet.mgmt.mib-2.system SCALAR_GROUP_BEGIN-sysDescr,"Nortel GateWay Controller GWC; MCPN750 128MB AA01 AA01 0001af02da30; PGC08AP (VRTXsa 3303, SNMP Research Agent 15.2.1.7)" SCALAR_GROUP_END //MIB-2 - .iso.org.dod.internet.mgmt.mib-2.host.hrDevice.hrProcessorT- able. hrProcessorEntry TABLE_BEGIN-hrProcessorLoad 1 TABLE_END //MIB-2 - .iso.org.dod.internet.mgmt.mib-2.host.hrStorage.hrStorageTable. hrStorageEntry TABLE_BEGIN-hrStorageIndex,hrStorageType,hrStorageAllocation- Units,hrStorageSize,hrStorageUsed,hrStorageAllocationFailures 1,host.hrStorage.hrStorageTypes.hrStorageRam,66 Bytes,1023,13,0 2,host.hrStorage.hrStorageTypes.hrStorageRam,1532 Bytes,400,0,0 3,host.hrStorage.hrStorageTypes.hrStorageRam,1536 Bytes,1024,49,0 4,host.hrStorage.hrStorageTypes.hrStorageRam,52 Bytes,512,321,0 5,host.hrStorage.hrStorageTypes.hrStorageRam,1 Bytes,11912704,184672,0 6,host.hrStorage.hrStorageTypes.hrStorageRam,1 Bytes,2097152,1577296,0 TABLE_END</pre> |

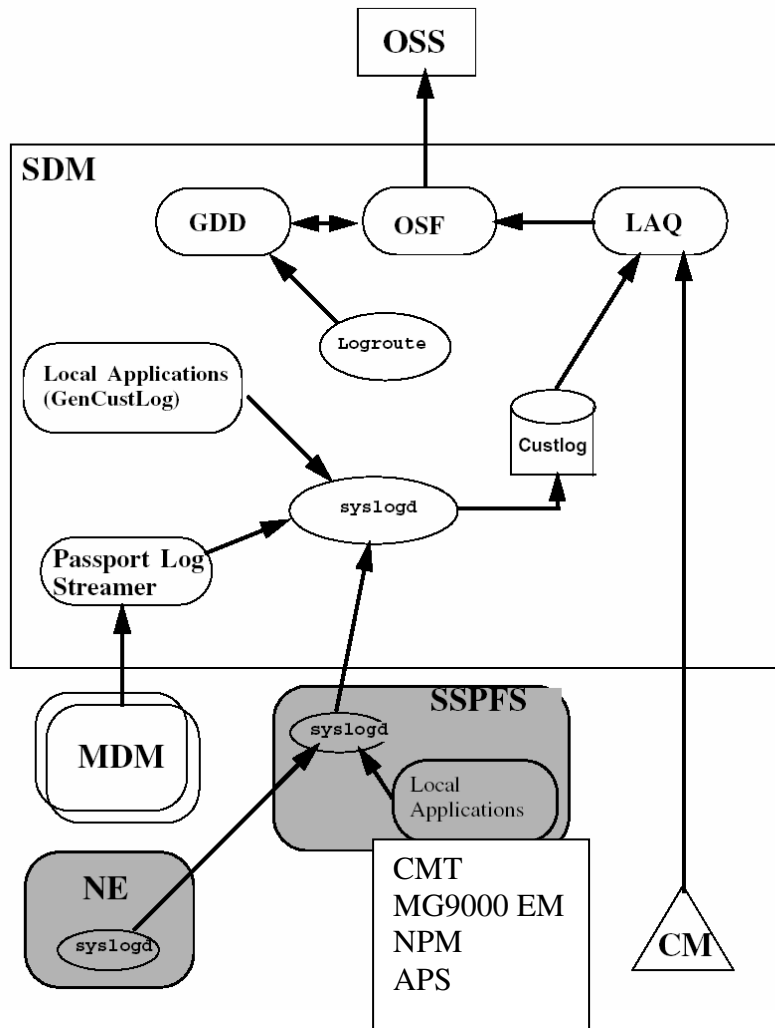
The following table shows sample output files from the GWC profile.

### Sample CSV output file for profile GWC

```
//GWC - .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.service-
Control.
legacyCallServer.lcsGateWayController.apgMeasurements
SCALAR_GROUP_BEGIN-accState,apgInsertions,maxSimulApg-
Calls,apgCallFailGWException,apgCallFailGWLost,
active,0,0,0,0
SCALAR_GROUP_END
//GWC - .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.service-
Control.
legacyCallServer.lcsGateWayController.dptMeasurements
SCALAR_GROUP_BEGIN-dptCallAttempts,dptCallFailResTimeout,dpt-
CallFailResError,dptCallFailAccOOS,
10,0,0,0,0
SCALAR_GROUP_END
//GWC - .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.service-
Control.
legacyCallServer.lcsGateWayController.gwcUnitStatusMIB.gwcUnitOb-
jects.gwcUnitStatus
SCALAR_GROUP_BEGIN-norUnitAdminStatus,norUnitOperSta-
tus,norUnitActivity,
unlocked,enabled,active
SCALAR_GROUP_END
//GWC - .iso.org.dod.internet.private.enterprises.nortel.voip.ptn.service-
Control.
legacyCallServer.lcsGateWayController.raMeasurements
SCALAR_GROUP_BEGIN-raState,totalResourceCapacity,resourceRe-
questError,inactive,0,0
SCALAR_GROUP_END
```

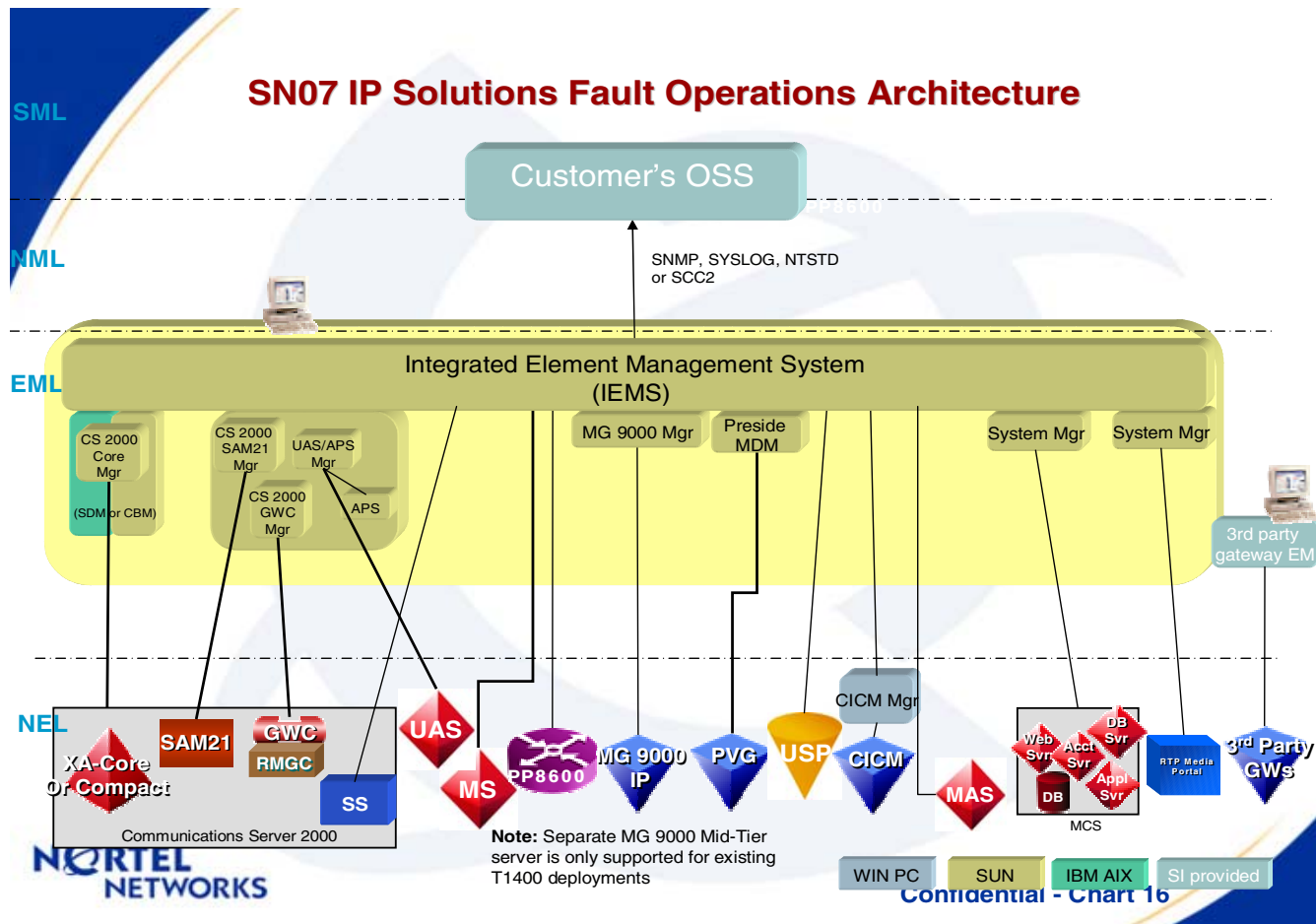
## Appendix J: SN07/SN08 IEMS Fault Transparency with SDM/CBM

Prior to IEMS, Succession supported sending faults and events from network elements via Syslog to the SDM. This feature, SYSLOG Consolidation for Succession, then allows the SDM to convert these logs to SCC2 or NTSTD to forward to the OSS. See the Figure below.



The fault feeds, delivered via IEMS supports SCC2 & NTSTD to the OSS, as did SDM. The implementation with IEMS used a more robust interfaces between the NE/EMS to IEMS and thus on a NE by NE basis there may be changes in the SCC2 log feed versus the SDM implementation. To understand fault diagram with IEMS see the diagram below.





To understand the differences between the IEMS implementation and the SDM implementation see the tables below.

### On NT STD and SCC2 Log Format Delimiters (SDM/CBM or IEMS to Fault OSS)

Table 1- ASCII Character Legend

| ASCII Character Legend |             |         |                   |
|------------------------|-------------|---------|-------------------|
| Character Name         | Hexidecimal | Decimal | Control Character |
| Line Feed:             | 0A          | 10      | ^J                |
| Carriage Return:       | 0D          | 13      | ^M                |
| End of Message:        | 19          | 25      | ^Y                |

|        |    |    |       |
|--------|----|----|-------|
| Null:  | 00 | 00 | ^@    |
| Space: | 20 | 32 | space |

Table 2 - STD and SCC2 Log Delimiter Comparison between SDM/CBM and IEMS

| STD and SCC2 Log Delimiter Comparison between SDM/CBM and IEMS |                                                                               |             |                      |                |
|----------------------------------------------------------------|-------------------------------------------------------------------------------|-------------|----------------------|----------------|
| <b>Last Updated:</b>                                           | <b>Dec. 6, 2004</b>                                                           |             |                      |                |
| <b>SDM/CBM Load:</b>                                           | <b>SN07: Generic Data Delivery 20.82.7.3, Log Delivery Service 20.82.7.12</b> |             |                      |                |
| <b>IEMS Load:</b>                                              | <b>SN07: IEMS_070_0435</b>                                                    |             |                      |                |
| <b>Platform/Product:</b>                                       | <b>SDM/CBM</b>                                                                | <b>IEMS</b> | <b>SDM/CBM</b>       | <b>IEMS</b>    |
| <b>Log Format:</b>                                             | <b>STD/STD_OLD</b>                                                            | <b>STD</b>  | <b>SCC2/SCC2_OLD</b> | <b>SCC2</b>    |
| <b>Start of Log String (HEX):</b>                              | 0A 0D                                                                         | 0D          | 0A 0D                | 0D             |
| <b>End of Line String (HEX):</b>                               | 0A 0D                                                                         | 0A 0D       | 0A 0D                | 0A 0D          |
| <b>End of Log String (HEX):</b>                                | 20 0A 0D 0A 0D 00                                                             | 0A 0D 00 0A | 0A 19 0A 0D          | 0A 0D 0A 19 0A |

Comments on Table 2:

- The above Log String data in Table 2 data for SN07 is applicable to and unchanged in SN08.
- The spaces between the hexadecimal numbers in Table 2 are there just to enhance readability. ie. 0D immediately follows 0A in the Start of Log String for SDM/CBM.
- In the SDM/CBM, the logroute user interface allows customers to modify, if desired, the:
  - Start of Log String (default value: 0A 0D in hex)
  - End of Line String (default value: 0A 0D in hex) and
  - The provisionable portion of the End of Log strings (default value: 20 0A 0D 0A 0D 00 where the second 0A 0D sequence is the provisionable portion).
- The log delimiters of IEMS are not provisionable in SN07 or SN08.
- IEMS was first generally available (GA) to customers in SN07. There was an SN06.2 beta where the delimiters for IEMS may have been different from those stated above.
- SDM Log delimiters may have been different in SN06 and previous releases. An OSS should consider the potential requirement of needing to support multiple Nortel software releases concurrently.

Table 3 - NE/EM Comparision

| <b>NE/EM, SCC2 Transparency</b>                             | <b>Difference or Notes</b>                                                                                                                                                                                                                                                                                                                                                                        | <b>OSS Impacting</b> |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| <b>CS2000, &amp; Peripherals, IW-SPM, MG4000, SDM, CBM,</b> | <b>Differences:</b><br><br><b>a) IEMS mandatory indent rule</b> - IEMS has a mandatory indent rule where if it comes across a log from the CS2K/SDM that is not indented appropriately in its view, it will add 8 spaces to the beginning of the line. Very few logs (such as BOOT201 below) are believed to be affected by this issue. With well written OSS templates and the fix in place, the | <b>a) No Impact</b>  |

| cCS2000 –<br><br>Transparent with the following Notes                                                                                                                                                                | affected logs should not be adversely affected when it comes to OSS parsing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                   |                                                                                                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                      | <table><tr><th>SDM SCC2 Samples:</th><th>IEMS SCC2 Sample:</th></tr><tr><td>* 08 BOOT201 INFO Bootp log report<br/>Mac Address : 0001af0bc772<br/>MAC addr to node_id lookup failure : 11<br/>INM permisssion to boot failure : 0<br/>Core IP address lookup failure : 0<br/>SEND_UDP_MSG failure : 0</td><td>* 08 BOOT201 INFO Bootp log report<br/>Mac Address : 0001af0bc772<br/>MAC addr to node_id lookup failure : 11<br/>INM permisssion to boot failure : 0<br/>Core IP address lookup failure : 0<br/>SEND_UDP_MSG failure : 0</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SDM SCC2 Samples: | IEMS SCC2 Sample: | * 08 BOOT201 INFO Bootp log report<br>Mac Address : 0001af0bc772<br>MAC addr to node_id lookup failure : 11<br>INM permisssion to boot failure : 0<br>Core IP address lookup failure : 0<br>SEND_UDP_MSG failure : 0 | * 08 BOOT201 INFO Bootp log report<br>Mac Address : 0001af0bc772<br>MAC addr to node_id lookup failure : 11<br>INM permisssion to boot failure : 0<br>Core IP address lookup failure : 0<br>SEND_UDP_MSG failure : 0 |                                                                                             |
| SDM SCC2 Samples:                                                                                                                                                                                                    | IEMS SCC2 Sample:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                   |                                                                                                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                             |
| * 08 BOOT201 INFO Bootp log report<br>Mac Address : 0001af0bc772<br>MAC addr to node_id lookup failure : 11<br>INM permisssion to boot failure : 0<br>Core IP address lookup failure : 0<br>SEND_UDP_MSG failure : 0 | * 08 BOOT201 INFO Bootp log report<br>Mac Address : 0001af0bc772<br>MAC addr to node_id lookup failure : 11<br>INM permisssion to boot failure : 0<br>Core IP address lookup failure : 0<br>SEND_UDP_MSG failure : 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                   |                                                                                                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                             |
|                                                                                                                                                                                                                      | <p><b>Notes:</b></p> <p><b>a)</b> Certain logs generated by the CS2K such as OMAU, OMGA, and the protologs (SWER, TRAP, INIT and so on) have no log number, just blank spaces. This is how they look on the CS2K and SDM/CBM. In an SN07 office where the SDM is feeding CS2K logs to IEMS, IEMS adds 000 for a log number. Eg. SWER000. In SN08, a resolution was implemented in IEMS whereby the 000 log number was no longer added to these SDM/CBM logs and the 3 spaces are maintained as it is received. <b>Resolved in SN08 via CR Q00980472.</b></p> <p><b>b)</b> When IEMS receives logs from managed components, it implements an 80 character per line rule for log bodies. If 80 characters is exceeded, an End of Line String is inserted at the 80<sup>th</sup> character and the remainder of the line is put onto the next line. In the case of logs from the SDM/CBM, where rows often exceed 80 characters, this wrap rule could result in visual or transparency differences between what the log looks like on SDM/CBM and IEMS. In some cases, trailing whitespace in a row could potentially be wrapped resulting in a blank line being created. In order to maintain transparency and avoid parsing issues with blank lines and so on, the 80 character wrap rule has been removed from the incoming feed to IEMS from SDM/CBM. <b>Resolved in SN07 via patch IEM0507D</b></p> <p><b>c)</b> Certain CS2K logs such as CARR and PM support an optional field called Equipment Identifier that shows up at the end of the log header after the Event Label. The CS2K has a "newline" rule (which the SDM/CBM implements as well) where the Equipment Identifier is removed from the header line in that it has its own line immediately following the header. The SDM/CBM's Log Delivery Service at SN07 final compile in its implementation of the 65 character newline rule incorrectly took into consideration the 9 characters for the optional ECOPE_FORMAT field. (Even when ECOPE is set to OFF in the SDM/CBM log device in logroute). This results in the Equipment Identifier field being "newlined" when the CS2K normally would not. (A transparency difference between what the log looks like on the CS2K and on the SDM/CBM). The end result of all this is that templates parsing CARR and PM logs (and any other Equipment Identifier-supporting logs) may no longer be able to parse these logs properly prior to implementation of the patch for this CR. <b>Resolved in SN07 via patches SDM_BASE.logs-20.82.7.10.tape, SDM_BASE.gdd-20.82.7.3.tape for SDM and NTLOGS208208-15.patch, NTGDD208208-03.patch for CBM.</b></p> <p><b>d)</b> SDM / CBM transparency issue. In the SN07 CBM product, some applications had started to communicate their failure events via an alarmd process. The resultant log looks different than the original (as seen on SDM). For failure events common to both SDM and CBM platforms, this created 2 versions of the log. 1 for SDM and 1 for CBM. Known logs affected were SDM327/SDM627. This second CBM version was undone in that . <b>Resolved in SN07 CBM patch CR Q01001000-01</b></p> |                   |                   |                                                                                                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                             |
| STORM<br>Partially<br>Transparent                                                                                                                                                                                    | <p><b>Differences:</b></p> <p><b>a)</b> Log name/numbers are retained but log formats are different. Believed to affect approx. 8 logs. See example below.</p> <table><tr><th>SDM SCC2 Samples:</th><th>IEMS SCC2 Sample:</th></tr><tr><td></td><td></td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | SDM SCC2 Samples: | IEMS SCC2 Sample: |                                                                                                                                                                                                                      |                                                                                                                                                                                                                      | <p><b>a)</b> No Impact if no existing OSS support for STM logs. Otherwise, the template</p> |
| SDM SCC2 Samples:                                                                                                                                                                                                    | IEMS SCC2 Sample:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                   |                                                                                                                                                                                                                      |                                                                                                                                                                                                                      |                                                                                             |
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|  | * 59 STM 803 5090 THR Threshold exceeded<br>Status: Alarm raised. Number of zombie(s) is 1.<br>Minor alarm threshold value is 1. | * 40 STM 803 0088 FLT STM Fault<br>Location: 172.18.17.6<br>Notification Id: 56<br>State: Raised<br>Category: qualityOfService<br>Cause: thresholdCrossed<br>Time: Sep 07 09:40:17 2004<br>Component Id: STORMIA=storm0<br>Specific Problem:<br>Description: Status: Alarm raised. Number<br>of zombie(s) is 1. Minor alarm<br>threshold value is 1. |  | would have to<br>change. |
|--|----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------|

| NE/EM &<br>SCC2<br>Transparency                          | Difference or Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                           | OSS Impacting                                                                                                             |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>GWC and<br/>GWC EM</b><br><br>Partial<br>Transparency | <b>Differences:</b><br><b>a)</b> GWC3XX set logs. (Approx. 17 logs). The syntax of the Category and Cause fields in the log body are different (spaces and Upper case characters).<br><b>b)</b> GWC399 (the clear log for the GWC3XX set logs) is not transparent. IEMS version of the log has 2 extra lines. (mainly for human interpretation).<br><br>Note: The Component Id structure difference in the example below is tracked by CR Q00976754 and resolved in SN07 patch ZOD41O7D. It is not an SDM / IEMS transparency issue. |                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>a)</b> No Impact.<br><b>b)</b> No Impact. A single OSS template should be able to handle both versions these GWC logs. |
|                                                          | <b>SDM SCC2 Samples:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>IEMS SCC2 Sample:</b>                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                           |
|                                                          | **16 GWC 301 5129 TBL GWC Fault<br>Location: GWC-1-UNIT-1<br>NotificationID: 1<br>State: Raise<br>Category: Quality of Service<br>Cause: Underlying resource unavailable<br>Time: Sep 01 13:16:11 2004<br>Component Id: GWC-1-UNIT-1<br>Specific Problem: Unit Out of Service: Unit is system disabled; Service is not available<br>Description: Standby unit disabled.                                                                                                                                                              | **28 GWC 301 0036 TBL GWC Fault<br>Location: GWC-0-UNIT-1<br>NotificationID: 1<br>State: Raise<br>Category: qualityOfService<br>Cause: underlyingResourceUnavailable<br>Time: Aug 27 13:28:43 2004<br>Component Id: GWC=GWC-?-UNIT-?<br>;Version=GN070CB;Unit=unit_1;Software=NODE MTC<br>Specific Problem: Unit Out of Service: Unit is system disabled; Service is not available<br>Description: Standby unit disabled. |                                                                                                                           |
|                                                          | 16 GWC 399 5155 INFO GWC Fault<br>Location: GWC-1-UNIT-1<br>NotificationID: 1<br>State: Clear<br>Time: Sep 01 13:16:21 2004                                                                                                                                                                                                                                                                                                                                                                                                          | 30 GWC 399 0050 INFO GWC Fault<br>Location: GWC-0-UNIT-1<br>NotificationID: 1<br>State: Clear<br>Time: Aug 27 13:30:45 2004<br>Component Id: GWC=GWC-?-UNIT-?<br>;Version=GN070CB;Unit=unit_1;Software=NODE MTC                                                                                                                                                                                                           |                                                                                                                           |

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|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|                                                               | Description: Standby unit disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |
| <b>MG9K ATM/IP &amp; MG9000 EM</b><br>Partial<br>Transparency | <b>Differences:</b><br>a) For all MG9000 logs having a format which includes the Category and State fields (generally alarm logs - approx. 200 in SN07, and 40 more in SN08), you will find that the syntax of the field value between SDM and IEMS can be slightly different. This is due to the MG9K EM outputting syslog to SDM and Corba to IEMS.<br>Example for SDM:<br>State: cleared<br>Category: Equipment Alarm<br>Example for IEMS:<br>State: Cleared<br>Category: equipment<br><br><b>Notes:</b><br>a) In SN07, the MG9000 Element Manager in an IEMS implementation was duplicating alarm logs sent to IEMS by including them in the syslog feed in addition to the Corba feed to IEMS. Application of the MG9000 EM patch will de-activate sending alarm logs to syslog remove the duplication. <b>Resolved in SN07 via patch IEM0807D for IEMS and 9K EM patch ZOD50</b> | a) No Impact |
| <b>SAM21</b><br>Transparent                                   | <b>Differences:</b><br>a) Some SAM21 logs (worst case 19 SCU logs) indent the event label 1 character (space). When IEMS processes this, the leading space in the Event Label is removed. SDM maintains the leading space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | a) No Impact |

| NE/EM & SCC2 Transparency                                                                                            | Difference or Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | OSS Impacting                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                      |                        |                                                                                                                                                                                                                     |                                                                                                                                                                                                                      |
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| Passport 8600<br>Not transparent                                                                                     | <b>Differences: (SN07)</b><br><b>a)</b> The logs reporting Passport 8600 SNMP trap events are completely different between SDM/CBM and IEMS. In SN07, the SDM uses the PPES300-307 log name/number set and obtains the data for these logs from MDM. IEMS listens to SNMP traps directly from the Passport 8600 and implements the PP398 log for the sets and PP399 for the clears.                                                                                                                                                                                  | <b>SN07:</b><br><b>a)</b> <b>No impact</b> – OSS coding support challenges may be present with extracting data from the Specific Problem and Description fields and being able to correlate the sets with the clears.<br><b>b)</b> <b>Impact Major</b> - A customer is either other going to ignore all IEMS602s or mark all critical – either way, it is going to be problem in SN07.<br><b>c)</b> <b>Impact Major</b> - There is insufficient information (only an IP address) to determine what is causing the fault and what needs to be corrected.<br><br><b>SN08:</b><br><b>a)</b> <b>No impact</b> – The above SN07 issues are resolved in SN08 and as with any new logs in a release, new templates will have to be written to support them. With the current |                                                                                                                                                                                                                      |                        |                                                                                                                                                                                                                     |                                                                                                                                                                                                                      |
|                                                                                                                      | <table><tr><th>SN07 SDM SCC2 Samples:</th><th>SN07 IEMS SCC2 Sample:</th></tr><tr><td>**20 PPES300 1486 TBL<br/>time: 2003 11 14 12 17 03<br/>event: set<br/>compId: PP8600 BATMAN IF 72<br/>severity: major<br/>faultCode: C0000002<br/>alarmType: communications<br/>commentData: Link down trap interface: 72</td><td>** PP398 SEP08 21:37:57 9992 TBL PP Fault<br/>Location: 10.102.15.130<br/>State: Raise<br/>Specific Problem: Generic Link Status<br/>Description: Link Down: ifIndex = 167<br/>( AdminStatus = up OpeationStatus = down )</td></tr></table> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SN07 SDM SCC2 Samples:                                                                                                                                                                                               | SN07 IEMS SCC2 Sample: | **20 PPES300 1486 TBL<br>time: 2003 11 14 12 17 03<br>event: set<br>compId: PP8600 BATMAN IF 72<br>severity: major<br>faultCode: C0000002<br>alarmType: communications<br>commentData: Link down trap interface: 72 | ** PP398 SEP08 21:37:57 9992 TBL PP Fault<br>Location: 10.102.15.130<br>State: Raise<br>Specific Problem: Generic Link Status<br>Description: Link Down: ifIndex = 167<br>( AdminStatus = up OpeationStatus = down ) |
|                                                                                                                      | SN07 SDM SCC2 Samples:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | SN07 IEMS SCC2 Sample:                                                                                                                                                                                               |                        |                                                                                                                                                                                                                     |                                                                                                                                                                                                                      |
|                                                                                                                      | **20 PPES300 1486 TBL<br>time: 2003 11 14 12 17 03<br>event: set<br>compId: PP8600 BATMAN IF 72<br>severity: major<br>faultCode: C0000002<br>alarmType: communications<br>commentData: Link down trap interface: 72                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ** PP398 SEP08 21:37:57 9992 TBL PP Fault<br>Location: 10.102.15.130<br>State: Raise<br>Specific Problem: Generic Link Status<br>Description: Link Down: ifIndex = 167<br>( AdminStatus = up OpeationStatus = down ) |                        |                                                                                                                                                                                                                     |                                                                                                                                                                                                                      |
| 20 PPES307 1487 TBL<br>time: 2003 11 14 12 17 06<br>event: clear<br>compId: PP8600 BATMAN IF 72<br>severity: cleared | 38 PP399 SEP08 21:38:00 9994 INFO PP Fault<br>Location: 10.102.15.130<br>State: Clear<br>Specific Problem: Generic Link Status<br>Description: Link Up: ifIndex = 167                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                      |                        |                                                                                                                                                                                                                     |                                                                                                                                                                                                                      |

|                       | faultCode: C0000002<br>alarmType:<br>commentData: Explicated CLEAR Alarm generated by GMDR.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | ( AdminStatus = up OpeationStatus = up ) | flexibility of the IEMS aging policy and that of an OSS, a working fault management system should be possible between the two of them. |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------|----------------|-----|-----------|-----------------------|-------|-----------|--------------------------|-------|-----------|-----------------------|-------|-----------|--------------------------|-------|----------|-----------------------|-------|--------|-----------------------|-------|-----------------------|---------------------------|-------|---------------------|----------------------------|-------|---------------|---------------------------|-------|-------------|----------------------------|-------|--------------|----------------------------|-------|------------|----------------------------|-------|--------------|----------------------------|-------|----------------|
|                       | 20 PPES300 1488 TBL<br>time: 2003 11 14 12 17 06<br>event: clear<br>compId: PP8600 BATMAN IF 72<br>severity: cleared<br>faultCode: C0000002<br>alarmType: communications<br>commentData: Link up trap interface: 72                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                          |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
|                       | b) IEMS only supported a limited set of Passport 8600 traps in SN07. (The ones listed below).<br>The unsupported Passport 8600 SNMP traps are treated by IEMS as unknown and reported northbound to the OSS as IEMS602 (Unknown Trap from Known Device).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                          |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
|                       | <table><tr><th>Alarm Name</th><th>Trap OID (v2c)</th><th>Log</th></tr><tr><td>coldStart</td><td>1.3.6.1.6.3.1.1.5.1.0</td><td>PP399</td></tr><tr><td>coldStart</td><td>1.3.6.1.4.1.2272.0.99001</td><td>PP398</td></tr><tr><td>warmStart</td><td>1.3.6.1.6.3.1.1.5.2.0</td><td>PP399</td></tr><tr><td>warmStart</td><td>1.3.6.1.4.1.2272.0.99002</td><td>PP398</td></tr><tr><td>linkDown</td><td>1.3.6.1.6.3.1.1.5.3.0</td><td>PP398</td></tr><tr><td>linkUp</td><td>1.3.6.1.6.3.1.1.5.4.0</td><td>PP399</td></tr><tr><td>rcChasPowerSupplyDown</td><td>1.3.6.1.4.1.2272.1.21.6.0</td><td>PP398</td></tr><tr><td>rcChasPowerSupplyUp</td><td>1.3.6.1.4.1.2272.1.21.14.0</td><td>PP399</td></tr><tr><td>rcChasFanDown</td><td>1.3.6.1.4.1.2272.1.21.7.0</td><td>PP398</td></tr><tr><td>rcChasFanUp</td><td>1.3.6.1.4.1.2272.1.21.21.0</td><td>PP399</td></tr><tr><td>rc2kCardDown</td><td>1.3.6.1.4.1.2272.1.21.11.0</td><td>PP398</td></tr><tr><td>rc2kCardUp</td><td>1.3.6.1.4.1.2272.1.21.12.0</td><td>PP399</td></tr><tr><td>rcSmltLinkUp</td><td>1.3.6.1.4.1.2272.1.21.19.0</td><td>PP399</td></tr><tr><td>rcSmltLinkDown</td><td>1.3.6.1.4.1.2272.1.21.20.0</td><td>PP398</td></tr></table> |                                          |                                                                                                                                        | Alarm Name | Trap OID (v2c) | Log | coldStart | 1.3.6.1.6.3.1.1.5.1.0 | PP399 | coldStart | 1.3.6.1.4.1.2272.0.99001 | PP398 | warmStart | 1.3.6.1.6.3.1.1.5.2.0 | PP399 | warmStart | 1.3.6.1.4.1.2272.0.99002 | PP398 | linkDown | 1.3.6.1.6.3.1.1.5.3.0 | PP398 | linkUp | 1.3.6.1.6.3.1.1.5.4.0 | PP399 | rcChasPowerSupplyDown | 1.3.6.1.4.1.2272.1.21.6.0 | PP398 | rcChasPowerSupplyUp | 1.3.6.1.4.1.2272.1.21.14.0 | PP399 | rcChasFanDown | 1.3.6.1.4.1.2272.1.21.7.0 | PP398 | rcChasFanUp | 1.3.6.1.4.1.2272.1.21.21.0 | PP399 | rc2kCardDown | 1.3.6.1.4.1.2272.1.21.11.0 | PP398 | rc2kCardUp | 1.3.6.1.4.1.2272.1.21.12.0 | PP399 | rcSmltLinkUp | 1.3.6.1.4.1.2272.1.21.19.0 | PP399 | rcSmltLinkDown |
| Alarm Name            | Trap OID (v2c)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Log                                      |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| coldStart             | 1.3.6.1.6.3.1.1.5.1.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| coldStart             | 1.3.6.1.4.1.2272.0.99001                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| warmStart             | 1.3.6.1.6.3.1.1.5.2.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| warmStart             | 1.3.6.1.4.1.2272.0.99002                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| linkDown              | 1.3.6.1.6.3.1.1.5.3.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| linkUp                | 1.3.6.1.6.3.1.1.5.4.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rcChasPowerSupplyDown | 1.3.6.1.4.1.2272.1.21.6.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rcChasPowerSupplyUp   | 1.3.6.1.4.1.2272.1.21.14.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rcChasFanDown         | 1.3.6.1.4.1.2272.1.21.7.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rcChasFanUp           | 1.3.6.1.4.1.2272.1.21.21.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rc2kCardDown          | 1.3.6.1.4.1.2272.1.21.11.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rc2kCardUp            | 1.3.6.1.4.1.2272.1.21.12.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rcSmltLinkUp          | 1.3.6.1.4.1.2272.1.21.19.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PP399                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
| rcSmltLinkDown        | 1.3.6.1.4.1.2272.1.21.20.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | PP398                                    |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
|                       | 59 IEMS602 7505 INFO<br>Location: 10.102.15.131<br>Event: .1.3.6.1.4.1.2272.1.21.8.0<br>Varbind0: .1.3.6.1.2.1.1.3.0: 203 days, 23 hours, 11 minutes, 22 seconds<br>.<br>Varbind1: .1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.4.1.2272.1.21.8.0<br>Varbind2: .1.3.6.1.4.1.2272.1.4.10.1.1.0: 267                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
|                       | c) IEMS Location Field has only an IP address.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |
|                       | Notes: (SN08)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |                                                                                                                                        |            |                |     |           |                       |       |           |                          |       |           |                       |       |           |                          |       |          |                       |       |        |                       |       |                       |                           |       |                     |                            |       |               |                           |       |             |                            |       |              |                            |       |            |                            |       |              |                            |       |                |

a) SN08 feature A00007343 was created to help address the above issues in 8600 fault management via IEMS. With the feature, a new set of logs (PP310 -> PP392) was created to addresses log format/content issues [a) and c)] and PP398/399 is no longer used. Full SNMP trap support as of SN08 was implemented as well [b)] and hence no IEMS602 logs would be seen for unsupported 8600 SNMP traps. This feature does not result in transparency between SDM and IEMS but it does clean up the IEMS log situation. See the SN08 IEMS log samples below for Passport 8600. PP317 is cleared by PP318 when the Component ID matches. At the time of writing, two SN08 IEMS logs for Passport 8600 (PP368 and PP369) have been patched back to SN07.

**IEMS PP317 SN08 SCC2 Sample:**

```

**01 PP 317 0119 TBL PP Fault
  Location: PP8600A;10.102.15.130
  State: Raised
  Category: communications
  Cause: loss of communication
  Time: Feb 10 16:01:46 2005
  Component ID: PP8600=10.102.15.130; ifIndex=72
  Specific Problem: Generic Link Status
  Description: Link Down: ifIndex = 72( AdminStatus = up OperationStatus =
down)
.1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.3.0
.1.3.6.1.2.1.1.3.0: 73 days, 5 hours, 35 minutes, 4 seconds.

```

**IEMS PP318 SN08 SCC2 Sample:**

```

01 PP 318 0120 INFO PP Fault
  Location: PP8600A;10.102.15.130
  State: Cleared
  Category: communications
  Cause: communication regained
  Time: Feb 10 16:01:48 2005
  Component ID: PP8600=10.102.15.130; ifIndex=72
  Specific Problem: Generic Link Status
  Description: Link Up: ifIndex = 72( AdminStatus = up OperationStatus = u
p)
.1.3.6.1.6.3.1.1.4.1.0: .1.3.6.1.6.3.1.1.5.4.0
.1.3.6.1.2.1.1.3.0: 73 days, 5 hours, 35 minutes, 6 seconds.

```

**Differences: (SN08)**

a) One noted difference between SN08 IEMS 8600 trap/log fault management and that of SDM/CBM via MDM is that MDM has implemented a per alarm aging mechanism where a trap is not part of a set/clear pair. (There are a lot of 8600 SNMP traps like this.) After a certain period of time, one of these autonomous logs (that has severity) will be cleared automatically. IEMS as of SN08 does not have a per alarm aging mechanism. In order to prevent a situation in IEMS where these autonomous logs are being raised but never cleared, an 8600 device alarm clearing policy has been implemented by default in the SN08 load. If any 8600 alarm has been present in IEMS for 7 days, it will automatically

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | be cleared by this policy. The clear notification will be an IEMS608 log which will contain information required in order to clear the previous set log for the alarm. While clearing 8600 alarms related to hardware such as fan or link down after 7 days is undesirable it was felt better than having no clear for the multitude of 8600 autonomous traps. Note: An OSS does not have to take action on aging clears if it does not want to. Or it can take action on only a subset of them. The 8600 aging policy in IEMS can also be disabled or modified to be something other than 7 days. |  |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|



| NE/EM, SCC2 Transparency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Difference or Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | OSS Impacting                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MSS15000, MG15000, MDM<br>Partial Transparency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Notes:</b><br>Between IEMS and SDM/CBM, MSS15000/MG15000/MDM log names are the same and appears to use the same mapping scheme. (Where the log prefix is determined by what the first 4 digits of the fault code is). Names are PPEM, MDM and CA. Log Body tags all the same.                                                                                                                                                                                                                                                                                                                                                     | <b>a) Minor impact</b> - Log numbers of 000 are usually invalid. Customers who have written templates for CA/MDM/PPEM3XX would have to add an additional line for PPEM000. The template logic would read something like; if you get an alarm raised with a PPEM3xx look for a PPEM3xx or PPEM307 or PPEM000 with the same compId and faultCode.<br><br><b>b)</b> No Impact<br><b>c)</b> No Impact |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Differences: (SN07 and SN08)</b><br><b>a)</b> Log numbers are maintained except that it would appear IEMS doesn't use PPEM/CA/MDM307 for explicit clears and instead uses a 000 number. OSS templates for PPEM000/CA000/MDM000 should be identical to PPEM307/CA307/MDM307 (explicit clear varieties). Inappropriate use of the 000 log number for explicit clears from MDM was discontinued in SN08. <b>Resolved in SN08 via CR Q00980484.</b>                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <table><tr><th>SN07 SDM/CBM Explicit Clear Sample:</th><th>SN07 IEMS Explicitly Clear Sample:</th></tr><tr><td>08 <b>PPEM307</b> 9380 TBL<br/>time: 2004 09 09 12 09 11<br/>event: clear<br/>compId: EM P15KE LP 12 SONET 1 STS 0<br/>severity: cleared<br/>faultCode: 70115261<br/>alarmType:<br/>commentData: Explicated CLEAR Alarm generated by GMDR.</td><td>46 <b>PPEM000</b> 8088 TBL<br/>time: 2004 09 09 12 46 42<br/>event: clear<br/>compId: EM P15KE LP 12 SONET 1 STS 0<br/>severity: cleared<br/>faultcode: 70115261<br/>alarmType: other<br/>commentData: Explicated CLEAR Alarm generated by GMDR.</td></tr></table> |                                                                                                                                                                                                                                                                                                                                                                                                   | SN07 SDM/CBM Explicit Clear Sample:                                                                                                                                                                                                                                                                     | SN07 IEMS Explicitly Clear Sample:                                                                                                                                                                                                                                                                     | 08 <b>PPEM307</b> 9380 TBL<br>time: 2004 09 09 12 09 11<br>event: clear<br>compId: EM P15KE LP 12 SONET 1 STS 0<br>severity: cleared<br>faultCode: 70115261<br>alarmType:<br>commentData: Explicated CLEAR Alarm generated by GMDR. | 46 <b>PPEM000</b> 8088 TBL<br>time: 2004 09 09 12 46 42<br>event: clear<br>compId: EM P15KE LP 12 SONET 1 STS 0<br>severity: cleared<br>faultcode: 70115261<br>alarmType: other<br>commentData: Explicated CLEAR Alarm generated by GMDR. |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SN07 SDM/CBM Explicit Clear Sample:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                   | SN07 IEMS Explicitly Clear Sample:                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 08 <b>PPEM307</b> 9380 TBL<br>time: 2004 09 09 12 09 11<br>event: clear<br>compId: EM P15KE LP 12 SONET 1 STS 0<br>severity: cleared<br>faultCode: 70115261<br>alarmType:<br>commentData: Explicated CLEAR Alarm generated by GMDR.                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                   | 46 <b>PPEM000</b> 8088 TBL<br>time: 2004 09 09 12 46 42<br>event: clear<br>compId: EM P15KE LP 12 SONET 1 STS 0<br>severity: cleared<br>faultcode: 70115261<br>alarmType: other<br>commentData: Explicated CLEAR Alarm generated by GMDR.                                                               |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
| <b>b)</b> IEMS has changed the field values of alarmType in some cases so that it aligns with a standard list of X.733 alarm categories. Where there was no equivalent alarm type in X.733, IEMS uses "other". (See table below). When logs come out of SDM/CBM, the original alarmtype as provided by MDM is maintained.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
| <table><tr><th>SN07/08 SDM/CBM alarmtype SCC2 Sample:</th><th>SN07/SN08 IEMS alarmtype SCC2 Sample:</th></tr><tr><td>**13 PPEM305 7877 TBL<br/>time: 2005 03 08 16 13 14<br/>event: message<br/>compId: EM P15KL NMIS \$ FMIP \$<br/>SESSION 9<br/>severity: major<br/>faultCode: 70060006<br/><b>alarmType: security</b><br/>commentData: 9 contiguous FMIP login attempts failed, last failure from 10.102.4.4 to<br/>userid: DEBUG</td><td>**41 PPEM305 8756 TBL<br/>time: 2005 03 08 14 40 41<br/>event: message<br/>compId: EM P15KL NMIS \$ FMIP \$<br/>SESSION 9<br/>severity: major<br/>faultcode: 70060006<br/><b>alarmType: other</b><br/>commentData: 9 contiguous FMIP login attempts failed, last failure from 10.102.13.16 to<br/>userid: DEBUG</td></tr></table> | SN07/08 SDM/CBM alarmtype SCC2 Sample:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | SN07/SN08 IEMS alarmtype SCC2 Sample:                                                                                                                                                                                                                                                                                                                                                             | **13 PPEM305 7877 TBL<br>time: 2005 03 08 16 13 14<br>event: message<br>compId: EM P15KL NMIS \$ FMIP \$<br>SESSION 9<br>severity: major<br>faultCode: 70060006<br><b>alarmType: security</b><br>commentData: 9 contiguous FMIP login attempts failed, last failure from 10.102.4.4 to<br>userid: DEBUG | **41 PPEM305 8756 TBL<br>time: 2005 03 08 14 40 41<br>event: message<br>compId: EM P15KL NMIS \$ FMIP \$<br>SESSION 9<br>severity: major<br>faultcode: 70060006<br><b>alarmType: other</b><br>commentData: 9 contiguous FMIP login attempts failed, last failure from 10.102.13.16 to<br>userid: DEBUG |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
| SN07/08 SDM/CBM alarmtype SCC2 Sample:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | SN07/SN08 IEMS alarmtype SCC2 Sample:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
| **13 PPEM305 7877 TBL<br>time: 2005 03 08 16 13 14<br>event: message<br>compId: EM P15KL NMIS \$ FMIP \$<br>SESSION 9<br>severity: major<br>faultCode: 70060006<br><b>alarmType: security</b><br>commentData: 9 contiguous FMIP login attempts failed, last failure from 10.102.4.4 to<br>userid: DEBUG                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | **41 PPEM305 8756 TBL<br>time: 2005 03 08 14 40 41<br>event: message<br>compId: EM P15KL NMIS \$ FMIP \$<br>SESSION 9<br>severity: major<br>faultcode: 70060006<br><b>alarmType: other</b><br>commentData: 9 contiguous FMIP login attempts failed, last failure from 10.102.13.16 to<br>userid: DEBUG                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |
| <b>c)</b> In SN07, when the alarmType value is qualityOfService, SDM reports the log number as 301                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                           |

longer the case. **Resolved in SN08 via unknown CR.**

|                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SN07 SDM/CBM SCC2 Sample:</b>                                                                                                                                                                                                                                                               | <b>SN07 IEMS SCC2 Sample:</b>                                                                                                                                                                                                                  |
| 04 <b>PPEM301</b> 5272 TBL<br>time: 2004 08 23 11 04 25<br>event: clear<br>compId: EM P15KL COL DEBUG AG 1<br>severity: cleared<br>faultCode: 70030001<br>alarmType: qualityOfService<br>commentData: currentQueueSize fell back to 500f maximum.<br>48 records discarded since the Set alarm. | **36 <b>PPEM307</b> 3736 TBL<br>time: 2004 09 23 10 36 17<br>event: set<br>compId: EM P15KH COL DEBUG AG 0<br>severity: major<br>faultcode: 70030001<br>alarmType: qualityOfService<br>commentData: currentQueueSize exceeded 75% of maximum.  |
| <b>SN08 SDM/CBM SCC2 Sample:</b>                                                                                                                                                                                                                                                               | <b>SN08 IEMS SCC2 Sample:</b>                                                                                                                                                                                                                  |
| **12 <b>PPEM301</b> 8786 TBL<br>time: 2005 02 23 14 47 02<br>event: set<br>compId: EM P15KE LP 2 ENG \$ AALIST \$<br>severity: major<br>faultCode: 70030007<br>alarmType: qualityOfService<br>commentData: current list size exceeded 750f maximum                                             | **49 <b>PPEM301</b> 5863 TBL<br>time: 2005 02 11 13 49 03<br>event: set<br>compId: EM P15KL COL DEBUG AG 15<br>severity: major<br>faultcode: 70030001<br>alarmType: qualityOfService<br>commentData: currentQueueSize exceeded 75% of maximum. |

**Summary of Transparency Differences Between SDM & IEMS (bold text):**

|                  |                |                        |                                |
|------------------|----------------|------------------------|--------------------------------|
| SDM alarmType    | SDM log number | IEMS alarmType         | IEMS log number                |
| communications   | 300            | communications         | 300                            |
| qualityOfService | 301            | qualityOfService       | <b>307 (SN07)</b> / 301 (SN08) |
| processing       | 302            | <b>other (SN07/08)</b> | 303                            |
| equipment        | 303            | equipment              | 303                            |
| environmental    | 304            | environmental          | 304                            |
| security         | 305            | <b>other (SN07/08)</b> | 305                            |
| debug            | 600            | (unknown)              | (unknown)                      |
| operator         | 306            | <b>other (SN07/08)</b> | 306                            |
| unknown          | 307 (set log)  | <b>other (SN07/08)</b> | 307                            |

|  |         |                      |                        |                                |  |  |
|--|---------|----------------------|------------------------|--------------------------------|--|--|
|  | (blank) | 307 (explicit clear) | <b>other (SN07/08)</b> | <b>000 (SN07) / 307 (SN08)</b> |  |  |
|--|---------|----------------------|------------------------|--------------------------------|--|--|

| NE/EM & SCC2 Transparency                                                                                                                                                                                                                                                                                                                                                                                        | Difference or Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | OSS Impacting                                                                                                                                             |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                |
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| CMT- SESM<br>Partial<br>Transparency                                                                                                                                                                                                                                                                                                                                                                             | <b>Differences:</b><br><b>a)</b> CMT399 is not transparent. IEMS version of this log has 2 extra lines.<br><b>b)</b> Partial transparency amongst all CMT3XX set logs (approx. 4 logs): Syntax of Category, and Cause fields are different. (See samples below).<br><b>c)</b> In CMT302 failure scenarios, it appears that IEMS uses an inconsistent Location field value between the set and clear. In SDM, SNMP_NE_Poller is consistently used. Resolution involves making the IEMS clear have SNMP_NE_Poller. <b>Resolved in SN08 via CR Q01078502 and CR Q01078502-02. Plans to patch back to SN07.</b>                                                                                                                                                                                                                                                                                                                                               | <b>a)</b> No Impact.<br><b>b)</b> No Impact.<br><b>c)</b> <b>Impact Major</b> – Customer may be unable to clear the alarm until the CR issue is resolved. |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                                                                                                                  | <table><tr><th>SDM SCC2 Samples:</th><th>IEMS SCC2 Sample:</th></tr><tr><td><b>**14 CMT 302 9000 TBL CMT Fault</b><br/>Location: SNMP_NE_Poller<br/>NotificationID: 1<br/>State: Raise<br/>Category: Communications<br/>Cause: Communications subsystem failure<br/>Time: Aug 31 13:34:14 2004<br/>Component Id: SESM=SNMP Device<br/>Poller;Device=GWC-6-UNIT-1;DeviceID=0x00000063000000a10a660f43<br/>Specific Problem: SNMP Timeout<br/>Description: CMT Unable to communicate with managed device</td><td><b>**29 CMT 302 5875 TBL GWC Fault</b><br/>Location: SNMP_NE_Poller<br/>NotificationID: 4<br/>State: Raise<br/>Category: communications<br/>Cause: communicationsSubsystemFailure<br/>Time: Sep 27 13:29:37 2004<br/>Component Id: SESM=SNMP Device<br/>Poller;Device=GWC-5-UNIT-0;DeviceID=0x00000063000000a10a660f3e<br/>Specific Problem: SNMP Timeout<br/>Description: CMT Unable to communicate with managed device</td></tr></table> |                                                                                                                                                           | SDM SCC2 Samples: | IEMS SCC2 Sample: | <b>**14 CMT 302 9000 TBL CMT Fault</b><br>Location: SNMP_NE_Poller<br>NotificationID: 1<br>State: Raise<br>Category: Communications<br>Cause: Communications subsystem failure<br>Time: Aug 31 13:34:14 2004<br>Component Id: SESM=SNMP Device<br>Poller;Device=GWC-6-UNIT-1;DeviceID=0x00000063000000a10a660f43<br>Specific Problem: SNMP Timeout<br>Description: CMT Unable to communicate with managed device | <b>**29 CMT 302 5875 TBL GWC Fault</b><br>Location: SNMP_NE_Poller<br>NotificationID: 4<br>State: Raise<br>Category: communications<br>Cause: communicationsSubsystemFailure<br>Time: Sep 27 13:29:37 2004<br>Component Id: SESM=SNMP Device<br>Poller;Device=GWC-5-UNIT-0;DeviceID=0x00000063000000a10a660f3e<br>Specific Problem: SNMP Timeout<br>Description: CMT Unable to communicate with managed device |
|                                                                                                                                                                                                                                                                                                                                                                                                                  | SDM SCC2 Samples:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                           | IEMS SCC2 Sample: |                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>**14 CMT 302 9000 TBL CMT Fault</b><br>Location: SNMP_NE_Poller<br>NotificationID: 1<br>State: Raise<br>Category: Communications<br>Cause: Communications subsystem failure<br>Time: Aug 31 13:34:14 2004<br>Component Id: SESM=SNMP Device<br>Poller;Device=GWC-6-UNIT-1;DeviceID=0x00000063000000a10a660f43<br>Specific Problem: SNMP Timeout<br>Description: CMT Unable to communicate with managed device | <b>**29 CMT 302 5875 TBL GWC Fault</b><br>Location: SNMP_NE_Poller<br>NotificationID: 4<br>State: Raise<br>Category: communications<br>Cause: communicationsSubsystemFailure<br>Time: Sep 27 13:29:37 2004<br>Component Id: SESM=SNMP Device<br>Poller;Device=GWC-5-UNIT-0;DeviceID=0x00000063000000a10a660f3e<br>Specific Problem: SNMP Timeout<br>Description: CMT Unable to communicate with managed device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                           |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>15 CMT 399 9946 INFO CMT Fault</b><br>Location: SNMP_NE_Poller<br>NotificationID: 1<br>State: Clear<br>Time: Aug 31 13:28:15 2004                                                                                                                                                                                                                                                                             | <b>38 CMT 399 6002 INFO GWC Fault</b><br>Location: GWC-5-UNIT-0<br>NotificationID: 4<br>State: Clear<br>Time: Sep 27 13:38:22 2004<br>Component Id: SESM=SNMP Device<br>Poller;Device=GWC-5-UNIT-0;DeviceID=0x00000063000000a10a660f3e<br>Description: CMT Reestablished communications with managed device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                           |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                |
| CMT-QCA<br>Partial<br>Transparency                                                                                                                                                                                                                                                                                                                                                                               | <b>Differences:</b><br><b>a)</b> IEMS implements an 80 character log body line length for all managed components except the logs from SDM/CBM. Some of the QCA logs as output to /var/log/customerlog on the CMT have a Description field value that exceeds 80 characters. IEMS puts the excess onto a new line whereas SDM/CBM does not when it receives it from syslog.<br><br><b>Notes:</b><br>SN08 introduced feature A00008338 to address certain general log supportability concerns for the                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <b>a)</b> No Impact                                                                                                                                       |                   |                   |                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                |

|                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                          |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                  | OSS. This corrective content feature will be patched back to SN07.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                          |
| <b>CMT-NPM</b><br>Transparent                                    | <b>Differences:</b><br><b>a)</b> Some NPM logs (11 logs worst case) indent the event label 1 character (space). When IEMS processes this, the leading space in the Event Label is removed. SDM/CBM maintains the leading space.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>a)</b> No Impact                                                                                                                      |
| <b>CMT-IEMS</b><br>(general northbound feed comparison with SDM) | <b>Differences:</b><br><b>a)</b> For NT STD and SCC2 log formats, the characters contained within the “Start of Log” and “End of Log” string delimiters are different. See Table 1 at the beginning of this Appendix.<br><b>b)</b> When IEMS re-syncs its alarm list with devices that support re-sync, IEMS creates clear logs for when discrepancies are found. ie Alarms it thought were there but went away. These clear logs used the original log name/number for the alarm in the database and the content of the “re-sync clear” was not necessarily the same. Resolution of this CR has resulted in the creation of a new IEMS log for re-sync raises/clears. (IEMS607). SDM/CBM has no such re-sync capability.<br><b>Resolved in SN07 via IEM1007D patch</b><br><br><b>Notes:</b><br>SN07 CR Q01001051 tracked the fact that the “end of log string” for SDM differs depending on whether ECORE_FORMAT is on or off in the device. This is not an SDM/IEMS transparency but an SDM/SDM one. (ECORE_FORMAT is not supported in Succession.) This issue has been resolved through the SN07 SDM/CBM patches. The End of Log string is now the same whether ECORE format is ON or OFF. (ECORE format is not supported in Succession and should be turned off for the SDM/CBM log device for IEMS fault communication). | <b>a)</b> No Impact.<br><b>b)</b> No Impact. A new template would have to be created for the IEMS607 log as is the case for any new log. |

| NE/EM & SCC2 Transparency                                                                                                                                                                                                                                                                                                                                                     | Difference or Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | OSS Impacting                                                     |                   |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |
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| CMT-UAS<br>Partial<br>Transparency                                                                                                                                                                                                                                                                                                                                            | <b>Differences:</b><br><b>a)</b> Minor difference in the syntax of the Cause field values. Eg. "outOfMemory" in IEMS vs "Out of memory" in SDM as per the example below.<br><b>b)</b> Minor difference in the syntax of the Category field values. Eg. "processingError" in IEMS vs "Processing Error" in SDM as per the example below.<br><b>c)</b> UAS399 not transparent. (Similar in fashion to GWC399 and CMT399). UAS399 is the clear log for all UAS3xx and 8xx raises. The IEMS version has 2 extra rows of information in the clear. See example below.                                                                                                                                                                                                                                                                                                           | <b>a)</b> No Impact<br><b>b)</b> No Impact<br><b>c)</b> No Impact |                   |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                               | <table><tr><th>SDM SCC2 Samples:</th><th>IEMS SCC2 Sample:</th></tr><tr><td><b>**19 UAS 353 1227 TBL UAS Fault</b><br/>Location: msh10uas-a<br/>NotificationID: 81924<br/>State: Raise<br/>Category: Processing Error<br/>Cause: Out of memory<br/>Time: May 22 11:19:13 2003<br/>Component Id:<br/>UAS;UASUnit=msh10uas-a;Software=LocalResourceManager_0<br/>Specific Problem: 81924<br/>Description: [mem_usage_high_major] Memory usage high. (803554284552sed)</td><td><b>**10 UAS 353 9836 TBL UAS Fault</b><br/>Location: cablabuas<br/>NotificationID: 81924<br/>State: Raise<br/>Category: processingError<br/>Cause: outOfMemory<br/>Time: Aug 30 15:10:48 2004<br/>Component Id:<br/>UAS;UASUnit=cablabuas;Software=LocalResourceManager_0<br/>Specific Problem: 81924<br/>Description: [mem_usage_high_major] Memory usage high. (91% used)"</td></tr></table> |                                                                   | SDM SCC2 Samples: | IEMS SCC2 Sample: | <b>**19 UAS 353 1227 TBL UAS Fault</b><br>Location: msh10uas-a<br>NotificationID: 81924<br>State: Raise<br>Category: Processing Error<br>Cause: Out of memory<br>Time: May 22 11:19:13 2003<br>Component Id:<br>UAS;UASUnit=msh10uas-a;Software=LocalResourceManager_0<br>Specific Problem: 81924<br>Description: [mem_usage_high_major] Memory usage high. (803554284552sed) | <b>**10 UAS 353 9836 TBL UAS Fault</b><br>Location: cablabuas<br>NotificationID: 81924<br>State: Raise<br>Category: processingError<br>Cause: outOfMemory<br>Time: Aug 30 15:10:48 2004<br>Component Id:<br>UAS;UASUnit=cablabuas;Software=LocalResourceManager_0<br>Specific Problem: 81924<br>Description: [mem_usage_high_major] Memory usage high. (91% used)" |
|                                                                                                                                                                                                                                                                                                                                                                               | SDM SCC2 Samples:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                   | IEMS SCC2 Sample: |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |
| <b>**19 UAS 353 1227 TBL UAS Fault</b><br>Location: msh10uas-a<br>NotificationID: 81924<br>State: Raise<br>Category: Processing Error<br>Cause: Out of memory<br>Time: May 22 11:19:13 2003<br>Component Id:<br>UAS;UASUnit=msh10uas-a;Software=LocalResourceManager_0<br>Specific Problem: 81924<br>Description: [mem_usage_high_major] Memory usage high. (803554284552sed) | <b>**10 UAS 353 9836 TBL UAS Fault</b><br>Location: cablabuas<br>NotificationID: 81924<br>State: Raise<br>Category: processingError<br>Cause: outOfMemory<br>Time: Aug 30 15:10:48 2004<br>Component Id:<br>UAS;UASUnit=cablabuas;Software=LocalResourceManager_0<br>Specific Problem: 81924<br>Description: [mem_usage_high_major] Memory usage high. (91% used)"                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                   |                   |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |
| <b>19 UAS 399 1228 INFO UAS Fault</b><br>Location: msh10uas-a<br>NotificationID: 81924<br>State: Clear<br>Time: May 22 11:19:14 2003                                                                                                                                                                                                                                          | <b>53 UAS 399 0642 INFO UAS Fault</b><br>Location: UAS_RTPU_TST<br>NotificationID: 49154<br>State: Clear<br>Time: May 11 10:53:37 2004<br>Component Id:<br>Description:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                   |                   |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |
| CMT –APS                                                                                                                                                                                                                                                                                                                                                                      | At this time there are no known methods for an APS set log to be transmitted northbound to the OSS.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No Impact                                                         |                   |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |
| CICM, MCS5200, USP, USPc, RTP Portal, Session Server, MS20x0, SPC<br><br>Not supported via SDM                                                                                                                                                                                                                                                                                | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | No Impact                                                         |                   |                   |                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                    |



# SN08 OSS Guide (IP)

## Advance Feature Guide

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