ATM/IP Solution-level Performance Monitoring

What's new in this release

ATTENTION
This document addresses all Nortel Networks Succession solutions. Some statements may not apply to your solution. The North American IAW solution is not included in the (I)SN07 release.

The terms Passport and PVG have been re-branded in conjunction with the new Nortel Network's brand simplified naming format. Passport is now referred to as the Nortel Networks Multiservice Switch, and PVG is now Media Gateway 7480/15000.

The table (I)SN07 features highlights the features introduced in this release. Refer to the OSS Advanced Feature Guide for more information about new features in this release.

(I)SN07 features (Sheet 1 of 13)

Feature descriptions

MG 9000 features

A00002280 -- MG9000 BITS interface on Supercore (UA-AAL1)

This feature introduces an interface to provide a redundant input to the Building Integrated Time Source (BITS). This signal is used to synchronize the MG9000 to the rest of the transmission network. The technology and functionality is ported from the Internet Telephony Extender design.

A00002607-- ABI XPM site and MG 9000 location support (UA-AAL1)

This feature provides physical location data to aid in the determination and resolution of ABI XPM out of service conditions and native MG 9000 line troubles on the Core.

Currently, these service-impacting failures can occur in many different points in the Succession networks. This feature will aid in identifying the failure points detectable by the Core by providing necessary and accurate location data.

A00003591 -- MG9000 channelized OC3 carriers (UA-AAL1, UA-IP)

This feature enables the user to view and modify the channelized carrier (OC3) configuration. Only the administrative and configuration status can be modified.

A00003531 -- MG9000 manager - Frame location enhancements (UA-AAL1, UA-IP)

This feature changes the following MG9000 GUIs:

- MG9K-EM Frame-view--Frames are displayed without a gap; the master frame is shown on the far left and all subtending frames to the right.

- MG9K-EM Provision a Virtual Media Gateway GUI--Internal frame number is hard-coded to zero in VMG name, while provisioning VMG

- MG9K-EM Alarm browser GUI--the Description field changes so that once Frame location information is provisioned, for new alarms, Frame location detail is appended to the data which is shown in this field in SN06.2. If Frame location information is not provisioned, default fillers are appended to the data which is shown in this field in SN06.2.

The performance management strategy for this feature is as follows:

The OM Collector (OMC) fetches performance data from MG9K through FTP, converts the performance data to CSV format and writes the converted data into an OMC CSV file. OSSs which are present towards the north bound interface of OMC, make use of these OMC CSV files.

(I)SN07 features (Sheet 2 of 13)

Feature descriptions
A00006639 -- MG 9000 Overload OM pegs (UA-IP, UA-AAL1) When a Media Gateway 9000 (MG 9000) begins to reach an overload threshold call connections request are denied. This condition can occur on an ITP, ABI or at the nodal level (DCC). A log is currently generated corresponding to the line or trunk which requested the connection. Overload condition occurs when the MG 9000 has reached a threshold where subsequent calls with the exception of calls marked 'essential or emergency' must be denied to prevent further catastrophic degradation of the MG 9000 node. With this feature, an Operational Measurement (OM) register will be incremented for every connection which is denied. A new OM group GWOVLOM will be defined and the register OVERLOAD will be incremented upon connection denial.
CS 2000 features
A00002766 -- Add extension registers for AMA OMS (All solutions)
This feature creates new OM group ATTAMA2 which provides overflow for registers for AMANS and AMUNANS from OM group ATTAMA. ATTAMA2 is enabled or disabled with SOC BAS000023. The ATTAMA OM group now has the maximum limit of 32 registers. Another group will be created to contain the extra extension registers. Only the extension registers for AMANS and AMUNANS will reside in the new ATTAMA2 OM group. The maximum register value for this group is now 32767 before it resets to 0. The extension register will allow capturing the number counter rollovers. The new extension functionality will be implemented under SOC control. This will allow for controlled customer implementation and also provide the ability to disable the new extension if required.
A00002739 -- Virtual Connections Admission Control (VCAC) (IAW, Int'l IAW) This feature introduces Virtual Call Admissions Control (VCAC). VCAC is 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.

(I)SN07 features (Sheet 3 of 13)

Feature descriptions

A00003506 -- H.248 PTS development (PT-IP)

This activity provides PTS trunking capabilities for the Succession Call Server 2000 (CS2K). This feature provides incoming, outgoing, and two-way interconnections from a North American End Office (EO), Access Tandem (AT), or InterExchange Carrier (IEC) to the Public Switch Telephone Network (PSTN).
The PSTN interconnection is provided using PTS trunk groups configured on a Gateway Controller (GWC) peripheral type where H.248 protocol is supported between the GWC and the Media Gateway (MG). The specific MG planned to provide this PTS functionality is the Passport Voice Gateway (PVG) and is planned to be available in the SN07.1 release timeframe.

This feature adds new restrictions for PTS trunk groups that are provisioned on a GWC, affecting the following levels of the MAP: TTP, MANUAL, MONITOR, and DATATTP.

This feature modifies these tables as follows:

- SERVINV adds four new exec line-ups. GWCABEX, GWCPXFX, GWCABFX, and GWCAB250 for GWC node types. The new exec line-ups are specific to Per-Trunk Signaling (PTS) trunk types that are configured on a GWC node type.

- TRKGRP adds new provisioning restrictions for PTS trunks groups configured on a GWC. The restrictions apply when the trunk group is assigned the GWCPTSTK option in table TRKOPTS and when a PTS group tuple is changed in table TRKGRP.

- TRKOPTS adds the new trunk group option, GWCPTSTK, that identifies PTS packet trunk groups that provide connectivity between the packet network and the PSTN.

- TRKMEM adds new provisioning restrictions for PTS trunks groups configured on a GWC.

**A00003662 -- Trimodal call server bridge maintenance
(PT-AAL1, PT-IP, UA-AAL1, UA-IP)**

This feature changes the office-wide, single bridge pool to support multiple bridge pools in a single CS 2000 Call Server. A bridge pool is created when it is datafilled in Table NETBRDGE and the first IW SPM node is defined in that bridge pool in Table MNNODE. Additional individual IW bridge nodes are added (still in the 4 groups of 504 endpoints each) as they are provisioned in Table MNNODE against the newly created bridge pool.

(I)SN07 features (Sheet 4 of 13)

Feature descriptions
A00003948 -- TRI MODAL server support on SESM & GWC EM (UA-AAL1, UA-IP) This feature introduces the following changes to the GWC manager to support multiple bearer networks: • Support the provisioning of multiple bearer network codec profiles. • Support the specification of a bearer network and a bearer network codec profile for each GWC. • Display the bearer network and network codec profile of each GWC on GWC-EM GUI. • Associate the bearer network and network codec profile with one GWC when adding GWC node from GWC-EM GUI. • Change the associated bearer network codec profile of one GWC node from GWC-EM GUI. • Support population of the selected bearer network in the CS 2000 Call Server table SERVRINV • Associate the bearer network and network codec profile with one GWC when adding GWC node from GWC-EM GUI.

(I)SN07 features (Sheet 5 of 13)

Feature descriptions
A00004036 -- AIN update message query, response enhancement (All solutions) This feature appends a Service Logic Identification Module (module code 039) to the current record as an AMAslpid is included in the corresponding update request. This feature creates seven new SOC options, as follows: - AIN00321 SVC MGR Basic handles all group 1 and 2 features except MWI, and Visual MWI. These features include ACB, AR, CWT, LDSA, CSMI, ACRJ and MSB in group 1. And PRN in group 2.   - AIN00322 SVC MGR List Editing handles all group 3 and 5 features. These features include DRCW and SCRJ in group 3. And SCA, SCF in group 5.   - AIN00323 SVC MGR Speed Call handles all group 9 features. These features include SCS, SC1/SC2/SC3, SCL and SCU.   - AIN00324 SVC MGR Call Forward handles all group 4 and group 6 features. These features include CFUIF/CFW, CFDA/CFD and CFBL/CFB in group 4. And CFDDVT in group 6.   - AIN00325 SVC MGR Privacy Control handles all group 7 features. These features include CNMB and CNNB.   - AIN00326 SVC MGR COT and CCW handles all group 8 features. These features include COT and CCW.   - AIN00327 SVC MGR SIMRING handles the SIMRING feature.   **A00004430 -- SVC failure OM group (UA-AAL1)** This feature introduces two new logs to replace ATM606. The XPKT301 log is generated for ATM external network connection failures that fail during initial call setup. The XPKT302 log is generated for ATM external network connection failures that occur for established connections. This feature also creates new OM group AL1SVCOM, used to provide OM registers for ATM switched virtual circuits (SVC) external network connection bearer path call origination attempts and call failures. The group has 16 registers and is associated with the XPKT301 log (for UNI Call Setup connection failures) or XPKT302 log (for UNI Mid-call connection failures) for SPM IW, DPT SPM, SMG4, and MG9K.

(I)SN07 features (Sheet 6 of 13)

Feature descriptions

MG 4000 features

A00003773 --OM for TRKQOS for MG4000 IP (PT-IP)

This feature adapts the existing office parameter PACKET_QOS_OM_THRESHOLDS in OFCVAR to support MG 4000. The same QOS OM threshold values defined in table OFCVAR will be applied to all MG4000-IP nodes datafilled on the Call Server.

This feature also adapts OM group, TRKQOSOM, to support MG4000 to record instances in which QOS threshold values have been exceeded for calls handled by MG4000-IP based TDM trunk group. The QOS statistics that are included in the OM for each MG4000-IP and GWC trunk group are packet loss, jitter, and delay (latency).

This feature extends trunk group based QoS OM support to MG4K-IP. The operational measurement values record instances in which QOS threshold values have been exceeded for calls handled by MG4K-IP based TDM trunk group.

CICM feature

A00003718 -- CICM OSMINE readiness - faults and alarms (Intl IAW)

This feature enhances the existing fault generation, logging, and performance management compatibility of the CICM system with the Integrated Element Manager System (Integrated EMS). Integrated EMS has been introduced to the Succession network and will manage the output used by external OSSs to monitor the network element.

Session Server feature

A00004271 -- SIP application server SOC (PT-IP, Intl PT-IP)

This feature implements a mechanism to control the maximum number of SIPT calls that utilize the Session Server platform when the far end is not a CS 2000. A usage SOC, CS2B0009, is implemented to limit these types of calls.

A00004414 -- SIP call server SOC (PT-IP, Intl PT-IP)

This feature implements a mechanism to control the maximum number of SIPT calls that utilize the Session Server platform when the far end is another CS 2000 (CS2CS). A usage SOC, CS2B0008, is implemented to limit these types of calls.

AIN feature

(I)SN07 features (Sheet 7 of 13)

Feature descriptions
A00004500 -- IN messages over IP (All solutions) This feature supports the AIN SS7 TCAP (Transaction Capability Application Part) messaging in Open Standards Protocol. This activity is provided on the DMS / CS2K - CORE. It is intended to transport the IN messages via the IP fabric - using the Simple Control Transport Protocol1 (SCTP). Control SOC INW0003 is used to control the IN Messaging over IP functionality. With the converging of PSTN and IP networks, the existing transfer protocols (e.g. TCP) have some major limitations. SCTP (Stream Control Transmission Protocol) is designed to overcome the limitations of TCP as well as supporting the extra requirements of PSTN signalling over IP networks. This feature supports AIN (IN) messages to / from the DMS / CS2K - CORE over SCTP / IP. This feature: • creates table IPAPPL to provide separation of various connections to the DMS/TDM. • modifies field SLHR to allow TCP, SCTP, and SS7 transports • modifies SOC optionality control (SOC) INW0003 to control the IN Messaging over IP functionality. The limit in SOC must be set to at least the number of tuples datafilled in the table IPAPPLTC. • creates new OM group AINTRAN for AIN transports. The group has 6 registers. **Media Server 2000 feature** **A00004873 -- MS2000 CLUI modifications (UA-AAL1, UA-IP, Intl IAW)** This feature enhances the existing MS2000 Series Node CLUI to handle configuration for the MS2020 ATM device. The following functionality will be added to the MS2000 CLUI: • ability to configure MS2020 device • force lock of a device • ability to change the SNMP community strings • ability to change the MS2000 web interface user name and password • ability to configure the NTP (Network Time Protocol) settings for the MS2000 device

(I)SN07 features (Sheet 8 of 13)

Feature descriptions
Traffic Office Position System (TOPS) features
A00005160 -- OSSAIN XA-CORE data messages capability enhancements (All solutions)
This feature enables OSSAIN data messaging to use XA-Core Ethernet interfaces such as the HIOP and the new HCMIC card. Prior to this activity, all OSSAIN messaging used the EIU (Ethernet Interface Unit).
A00003687 -- TOPS wireless intelligent network integration (All solutions)
This feature modifies TOPS131 by adding additional text reasons to the Reason field and by adding a new field, Wireless type, which indicates whether the log was generated on an IS-41 or GSM call. The feature creates two new tables. • Table Mobile Switching Center Identifier Mapping (MSCIDMAP) maps MSCIDs to TLDN pool identifiers from Table TOPSTLDN. This allows the customer to control TLDN allocation on a per-MSC basis. • Table TOPS Message Center Database (TOPSMCDB) provides datafill for a TOPS SMS SS7-based message center simulator. An operator position or automated node can send SMS messages using either IS-41 TCAP or GSM TCAP. When the simulator receives the SMS, it looks up the data stored against the SMS destination number to determine the disposition of the SMS. The simulator can successfully acknowledge the SMS, send back a failure message, or ignore the SMS so the TOPS SMS time-out code executes.
CS 2000 Call Server feature

(I)SN07 features (Sheet 9 of 13)

Feature descriptions
A00002012 -- HIOP-CMIC/RTIF development (all solutions) This feature modifies the OAM software for the High Performance Input Output Processor card (HIOP) with CMIC, RTIF, TOD, and ETHR functionality (CMIC/RTIF HIOP). The CMIC/RTIF HIOP card supports: • Core to Message Switch (MS) InterConnect (CMC), providing high-speed access to the DMS Message Switch via OC3 links • Reset Terminal InterFace (RTIF). The RTIF ports support XA-Core connectivity to Video Display Terminals (VDT) (EIA RS232 standard). The RTIF remote ports provide a connection to remote terminals via modem (EIA RS422 standard). • Time Of Day (TOD) support • Ethernet, providing high-speed access to the Succession network via 100 Mb/s full duplex Ethernet links The XA-Core CMIC/RTIF HIOP OAM software provides the maintenance interface to monitor and manipulate the HIOP common equipment, CMIC, RTIF, ETHR ports and links, and TOD. The software: • changes the existing CMIC MAP level and MAP commands in order to maintain the new CMIC ports • changes the existing RTIF MAP level and MAP commands in order to maintain the new RTIF links (local and remote) • changes the existing alarms, logs, and operational measurements that report on the maintenance status of the CMIC and RTIF ports and links

(I)SN07 features (Sheet 10 of 13)

Feature descriptions

A00003487 -- Trimodal provisioning, logs and OMs (UA-AAL1, UA-IP)

This feature starts work in the CS 2000 Call Server to support multiple bearer networks. These bearer networks include both the legacy ENET bearer network and up to seven additional packet bearer networks. In the (I)SN07 release, a bearer network framework is implemented but full integration of all possible supported configurations will not be supported in this release. In (I)SN07, the focus will be on supporting three bearer networks:

- ENET
- AAL1 packet network
- IP packet network

The main focus in (I)SN07 is to support a UA-AAL1 and a UA-IP configuration with a single CS 2000 Call Server. In addition, there are requirements to support some limited Carrier Hosted Services (CHS) functionality as well (i.e. H.323 and Media Call Server 5200 (MCS 5200).

Interworking between the UA-AAL1 and UA-IP configurations in a multibearer network configuration is supported in (I)SN07. However, interworking with the CHS agents is limited in (I)SN07. In (I)SN07, there is no support for interworking between the H.323 gateway (using a Media Portal) and the IP IW SPM. For this reason, a loop around trunk, hosted by a PVG on the CHS bearer network and hosted by a PVG in the UA IP bearer network or an MG 4000 in the UA AAL1 bearer network or an SPM/DTC in the ENET network, must be used to provide connectivity between the H.323 GW and all other agents on the CS 2000 Call Server.

A00001930 -- Last and Total Call Meter Inquiry services (All solutions)

This feature provides Last and Total Call Meter Inquiry (CMI) services.

- Last Call Meter Inquiry (LCMI) allows the subscriber to enquire about the meter count for the last call made by dialing a predefined number. When the number is dialed, the meter count of the last call and the feature meter count of the last call is announced in English. Note that only answered calls and feature calls (that is, subscriber activation, deactivation, interrogation calls, and feature usage) are taken into consideration for the announcement provided to the LCMI service.

- Total Call Meter Inquiry (TCMI) allows the subscriber to enquire about the total meter count by dialing a predefined number. When the number is dialed, the total of all assigned meters of the subscriber is announced in English.

A00002510 -- LANCOMM IP over IRM (All solutions)

(I)SN07 features (Sheet 11 of 13)

Feature descriptions
This feature will provide LANCOMM IP over the IRM on XA-CORE. The purpose of this feature is to provide LANCOMM TCP and UDP availability when communicating over the XACORE Ethernet messaging system. This feature does not address LANCOMM issues of performance or robustness. At present the IRM IP is used to transmit and receive packets to and from the XACORE IO hardware. The IRM implementation of IP is very minimal with some of the features such as ARP routing being performed by the firmware. The IRM IP implementation does not support TCP or features like IP fragmentation and extra options. The LANCOMM version of IP supports IP more completely. This feature will use the IRM IP to receive packets from the IO cards, however the IRM will then will use callback routines that will be registered with the IRM for packets intended for LANCOMM to pass the packets to LANCOMM UDP or TCP. The LANCOMM IP will be used to process the packets. A TCP or UDP packet coming from the LANCOMM intended for the IRM will be injected into the IRM IP after it has passed through the LANCOMM IP to be transmitted to Ethernet. The specific purpose of this feature is to support the Next generation Supernode Data Manager (nSDM) that is being developed on a Solaris platform to replace the existing SDM FX which uses a DS512 to connect to the CORE. The nSDM will not have a DS512. It will connect to the CORE via Ethernet. This feature will also support FTP or TELNET over IRM from another source other than the SDM like for instance an workstation. This will not be a EIU replacement but will exist in the same load as EIU. This feature will support the following SDM applications with LANCOMM IP over IRM. • RPC (UDP) • Network time protocol (UDP) • FTP (TCP) • Telnet (TCP) • SBA Billing (RFC TCP) **A00003947 -- Trimodal logs and OMs (PT-AAL1, PT-IP, UA-AAL1, UA-IP)**

(I)SN07 features (Sheet 12 of 13)

Feature descriptions

This feature addresses the OMs, logs, traver and translations components of the Trimodal Call Server. This feature introduces the following:

- new office parameter (MULTINET_DISPLAY_ACTIVE)
- OM enhancements
  — enhancement to DPTNODE
  — new OM groups - IWBMNODE, TRK2NET1, TRK2NET2, OFZ2NET1, OFZ2NET2, DPTOFCP
- log enhancements
  — IWBM 800 series log enhancements to display the bridge pool
  — new XNET600 series logs for external packet bearer network connectivity problems
- translations enhancements
  — conditional PKT selector renamed to FABRIC and enhanced to support ATM and IP fabrics
  — new BEARNET conditional selector to support criteria checking based on network name
- traver enhancements
  — new traver option BEARNET to input the network name of the incoming trunk agent to support FABRIC and BEARNET conditional selector routing
  — the traver TRKMEM option is enhanced to derive the originating trunk bearer network/fabric. The bearer network/fabric is used to support FABRIC and BEARNET conditional selector routing

CS 2000 Management Tools feature

A00003691 -- Integrated EMS SNMP OM polling from GWC and SC (UA-AAL1)

This feature allows the SNMP poller application to read MIB data for the SAM21 Shelf Controller (SC) and the Gateway Controller (GWC) from a location other than the CS 2000 Management Tools server. A new subnet configuration capability is added to the CS 2000 SAM21 Manager client to provision or modify the IP address where the SNMP poller application resides.

A00001919 -- CEPT services password enhancement (All solutions)

(I)SN07 features (Sheet 13 of 13)

Feature descriptions

This feature provides password enhancements for CEPT features and remote access to the CEPT feature. The two main functionalities are:
 	
• CEPT features password (CEPTPW). This feature introduces a new line option to provide a unique password for the subscriber. This password is valid for the features which are ILR (International Line Restriction) for IBN lines, OCB (Outgoing Call Barring) for BRI lines.
 	
• CEPT features remote access (CEPTRA). This feature introduces a new framework to control some CEPT feature functionalities of IBN lines from remote agents Currently, only CFRA is supported to control CEPT Call Forwarding flavors remotely. This feature replaces this CFRA functionality and CEPTRA controls following CEPT features.
 	
   — International Line Restriction (ILR)
 	
   — International Wake-Up (IWUC)
 	
   — Call forwarding (CFU, CFB, CFDA)
 	
   — CEPT features password (CEPTPW)
 	
CEPTRA allows activation/programming, deactivation or interrogation of CEPT features on an end user's telephone from a remote location. You can use CEPTRA from a telephone resident on the same switch as the end user's set or from a set outside the end user's switch using a Direct Inward System Access (DISA) number.

Overview

> **ATTENTION**
> This document addresses all Nortel Networks Succession solutions. Some statements may not apply to your solution.

This document describes performance management for the following solutions.

Solution	
International IP solutions	Integrated Access Wireline (IAW) (page 26)
	Integrated Access-Cable Media (IAC) (page 26)
	Packet Transit-IP (PT-IP) (page 26)
	Universal Access-IP (UA-IP) (page 26)
International ATM solutions	Packet Transit-AAL2 (PT-AAL2) See page 27.
North American IP solutions	Packet Trunking-IP (PT-IP) (page 26) or Packet Trunking-AAL2 (PT-AAL2) (page 27)
	Integrated Access-Cable Media (IAC) (page 26)
	Universal Access-IP (UA-IP) (page 26)
North American ATM solutions (see Note)	Universal Packet Access (UA-AAL1) (page 23)

Solution
• Packet Trunking AAL1 (PT-AAL1)   There are three distinct architectures supported within the PT-AAL1 solution: — Packet Trunking AAL1 (PT-AAL1) (page 22)   — Packet Trunking - SN70 (PT-SN70) (page 24)   — Packet Trunking - XA Core (PT-XA Core) (page 24)
Note: Collectively, these two Succession solutions are referred to as ATM solutions.

Performance strategy

There are three types (or streams) of performance data generated:

- operational measurements (OMs)

- performance measurements (PMs)

- performance data sent to an Engineering and Administration Data Acquisition System (EADAS) data collection system

Operational measurements

The operational measurements (OM) information is a switch administration and maintenance tool. The user uses OMs for the following specified switch administration activities:

- Traffic provisioning: The OMs collect information on how to load equipment. The OMs allow the calculation of the load process for each unit. A unit is a main station or a trunk. This data forecasts future equipment loading and determines future equipment requirements.

- Service monitoring: The OMs can indicate switch service levels. If reduction in service occurs, the analysis of additional data helps to determine the corrective action. Corrective action can include equipment repair, balance again, or support. Corrective action can occur in near-real time. Network management activities are an example of corrective action that occurs in near-real time. Corrective action can occur over a long period of time.

- Division of revenue: Operational measurements help operating company personnel decide how to separate traffic. The division of

traffic volumes to different switch components allows the best division of revenues to occur.

- Feature activation: Specified measurements provide information on how often features are active in the switch. Operating companies or subscribers can use this information to determine the requirement for additional equipment or capabilities.

- Subscriber line usage studies: The user can perform studies on the use of each line to assess the requirement for additional subscriber equipment.

- Problem identification: The OMs display the results of machine diagnostic and testing activity. This information identifies possible problem areas in the switch.

OMs are performance data and are collected from the following components:

- CS 2000 (or CS 2000-Compact, or SN70EM, or XA-Core)
- IW SPM
- CICM
- CS 2000 GWC
- MG 9000
- MG 4000
- DPT SPM
- Media Application Server (MAS)
- Media Gateway 7480
- Media Gateway 15000
- MS 2000 series
- RTP Media Portal
- Universal Audio Server (UAS)
- Universal Signaling Point (USP)

The OMs are delivered downstream to an operations support system (OSS) by means of several delivery mechanisms:

- the Operational Measurement Delivery (OMD) application on the CS 2000 Core Manager (or SDM) delivers OM performance data from the following components:

  — CS 2000 (or CS 2000-Compact)

  — IW SPM

  — DPT SPM

  — CS 2000 GWC

  — MG 9000

  — MG 4000

  For more information on the OM performance data from these components, see Operational measurements (CS 2000 architecture) and Operational measurements (CS 2000-Compact architecture) in this document.

  For more information on the OMD application, see The Operational Measurement Delivery application in this document.

- EADAS operational measurements are available to a downstream OSS as a live feed of data consisting of specific OM groups. There are two methods for obtaining the EADAS live feed of data:

  — through the MPC card on the input/output controller (IOC)

  — using the GR740 Pass Through application on the CS 2000 Core Manager (or SDM)

  For more information on EADAS, see EADAS Data Collection in this document.

  Note: EADAS is not widely used outside North America, but the CS 2000 is capable of supporting EADAS interfaces if required.

- The File Transfer Protocol (FTP) pulls USP OMs directly to an OSS USP OMs are not merged with CS 2000 or CS 2000-Compact OMs and are not routed to the CS 2000 Core Manager

    Note: The USP exports operation measurement in the Semicolon Separated Value (SSV) format.

- The CS 2000 GWC pulls quality of service (QoS) OMs for the following components.

    — Media Gateway 7480

    — Media Gateway 15000

    — Universal Audio Server (UAS)

    — Multimedia Terminal Adapter (MTA)

    The CS 2000 GWC forwards these OMs to the QoS Collector Application where they can be viewed or forwarded to the OSS.

    Note: Media Gateway 7480/15000 does not support QoS OM or QCA in the PT-AAL2 solution.

    For more information, see Operational measurements (CS 2000 architecture) and Quality of Service Collector Application.

Performance measurements

PMs are performance data and are collected from the following components:

- CS 2000 GWC
- CICM
- CICM Manager
- Media Gateway 7480
- Media Gateway 15000
- Passport 8600
- Media Server 2000 (MS 2000)
- Session Server
- Universal Audio Server (UAS)
- Universal Signaling Point (USP)
- Multiservice Switch 15000

CS 2000 GWC PMs

CS 2000 GWC PMs are displayed as PM parameters on certain screens in the CS 2000 GWC Manager. In addition CS 2000 GWC PM data relating to GWC-DPT-SERVICES-PM-MIB are viewed in the PM Poller CSV files.

CICM and CICM Manager PMs

CICM and CICM Manager PMs are displayed in real-time on Integrated EMS. The CSV or XML-formatted files are exported to an OSS.

Media Gateway 7480 and Media Gateway 15000 PMs

The PMs for the Media Gateway 7480 and Media Gateway 15000 relate to ATM port statistics. These statistics are collected from the Media Gateway 7480 and Media Gateway 15000 asynchronous transfer mode (ATM) interfaces.

Passport 8600 PMs

Passport 8600 PMs can be viewed on the Device Manager.

Media Server 2000 Series PMs

Media Server 2000 PMs are pulled by the PM Poller and stored in CSV files. The CSV-formatted data can be exported to the OSS.

UAS PMs

UAS PMs can be viewed in real time on the UAS Manager, or they can be pulled in CSV format to the OSS.

USP PMs

Universal Signaling Point (USP) PMs can be viewed on the USP Manager in Semicolon Separated Value (SSV) format.

Multiservice Switch 15000 PMs

Performance data can be viewed in CSV format at the CS 2000 Core Manager, or this CSV-formatted data can be exported from the CS 2000 Core Manager to the OSS. Both 5 and 30 minute PMs are collected by the Preside MDM.

- For PT-AAL1, the standard procedure is to send Multiservice Switch 15000 PMs in CSV format to the OMD application on the CS 2000 Core Manager (or SDM). These Multiservice Switch 15000 PMs can then be accessed in the same way as the CSV files for the CS 2000 OMs.

- For UA-AAL1, the standard procedure is to write Multiservice Switch 15000 CSV files to local disks on the Preside MDM. The PM information is then spooled to the SuperNode Data Manager (SDM) from Preside MDM. The OSS can then collect these CSV files from the SDM.

EADAS operational measurements

Alternatively, the ATM/IP solutions support the export of performance measurements to an Engineering and Administration Data Acquisition System (EADAS) at the OSS.

Note: EADAS is not widely used outside North America, but the CS 2000 is capable of supporting EADAS interfaces if required.

For more information on EADAS, see EADAS Data Collection in this document.

Integrated Element Management System

The Integrated Element Management System (Integrated EMS) acts as a performance aggregation point for supported EMS modules and NEs. For more information on Integrated EMS, see Integrated Element Management System performance overview in this document.

Performance data collection systems

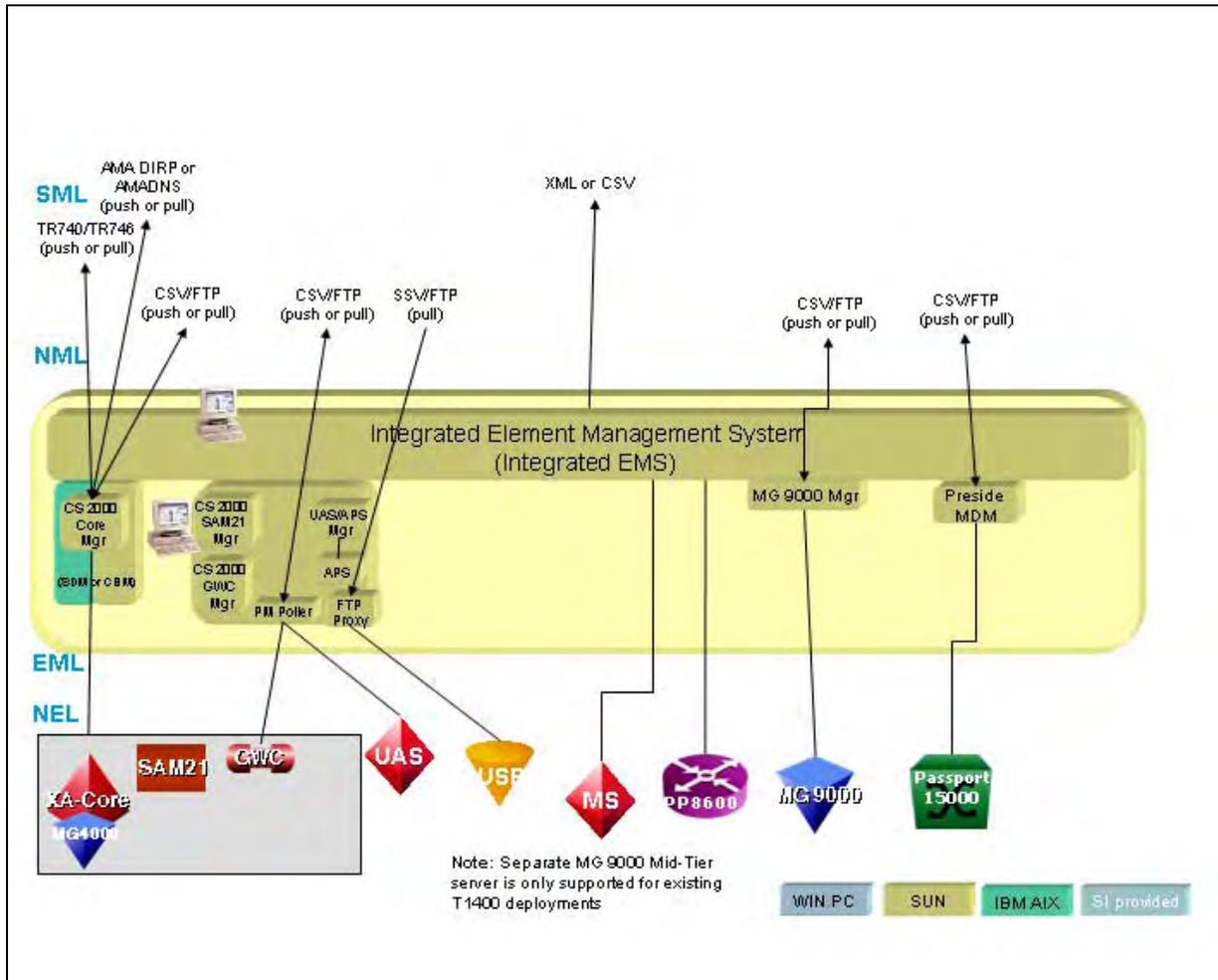The following figures show a high-level view of how performance data is collected from components in each solution.

- Packet Trunking AAL1 (PT-AAL1) performance data collection systems on page 22

- Universal Packet Access (UA-AAL1) performance data collection systems on page 23

- Packet Trunking -SN70 (PT-SN70) and Packet Trunking-XA Core (PT-XA Core) performance data collection system on page 24

- Performance data collection for IP solutions with the CS 2000 architecture on page 25

- Performance data collection for IP solutions with the CS 2000-Compact architecture on page 26

- Performance data collection for the PT-AAL2 solution on page 27

## Packet Trunking AAL1 (PT-AAL1) performance data collection systems
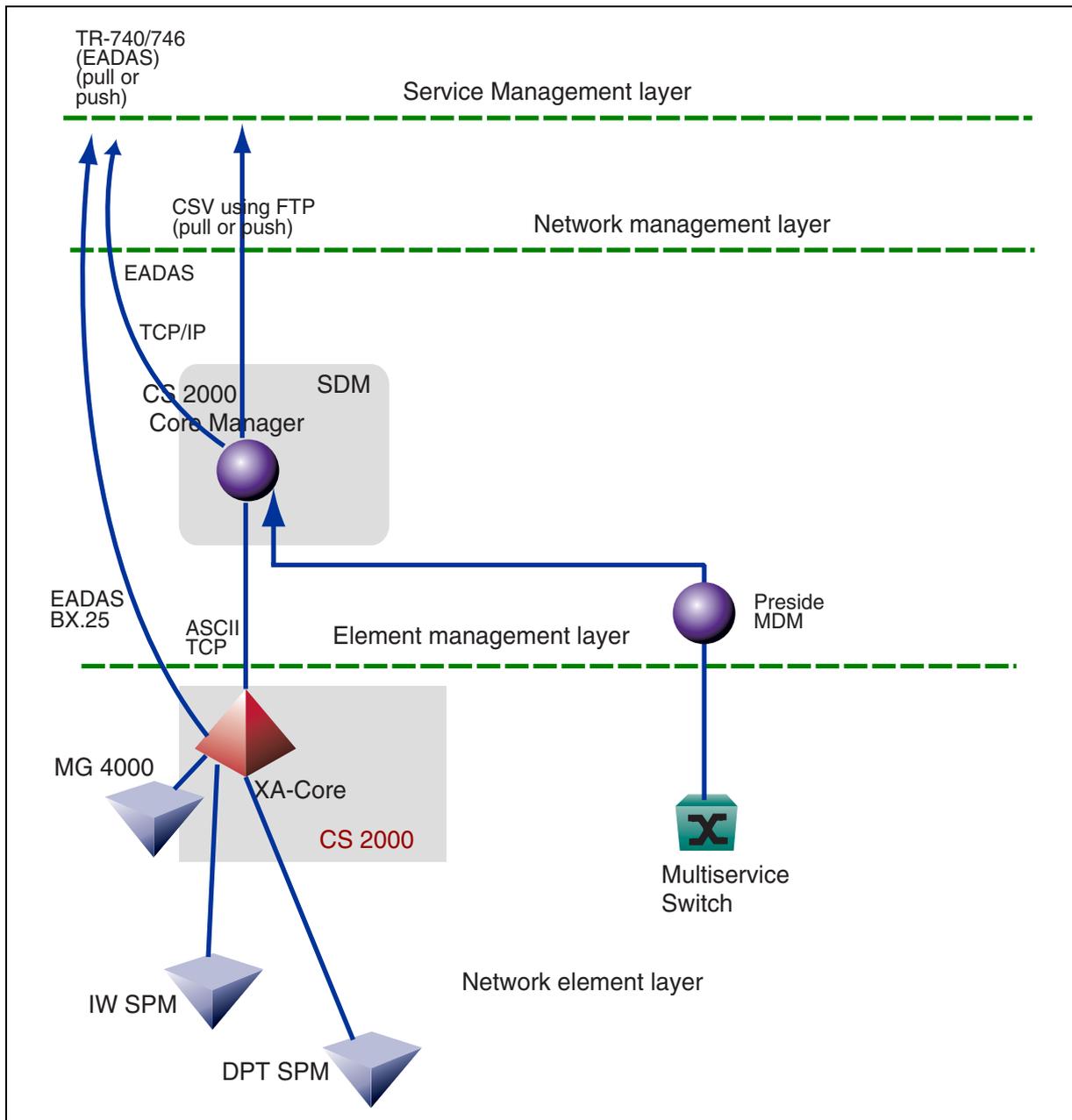
The figure Universal Packet Access (UA-AAL1) performance data collection systems shows a high-level view of how UA-AAL1 performance data is collected from components that make up the UA-AAL1 solution.

## Universal Packet Access (UA-AAL1) performance data collection systems

Note: Separate MG 9000 Mid-Tier server is only supported for existing T1400 deployments

The figure Packet Trunking -SN70 (PT-SN70) and Packet Trunking-XA Core (PT-XA Core) performance data collection system shows a high-level view of how PT-SN70 or PT-XA Core performance data is collected from components that make up the solutions.

**Packet Trunking -SN70 (PT-SN70) and Packet Trunking-XA Core (PT-XA Core) performance data collection system**
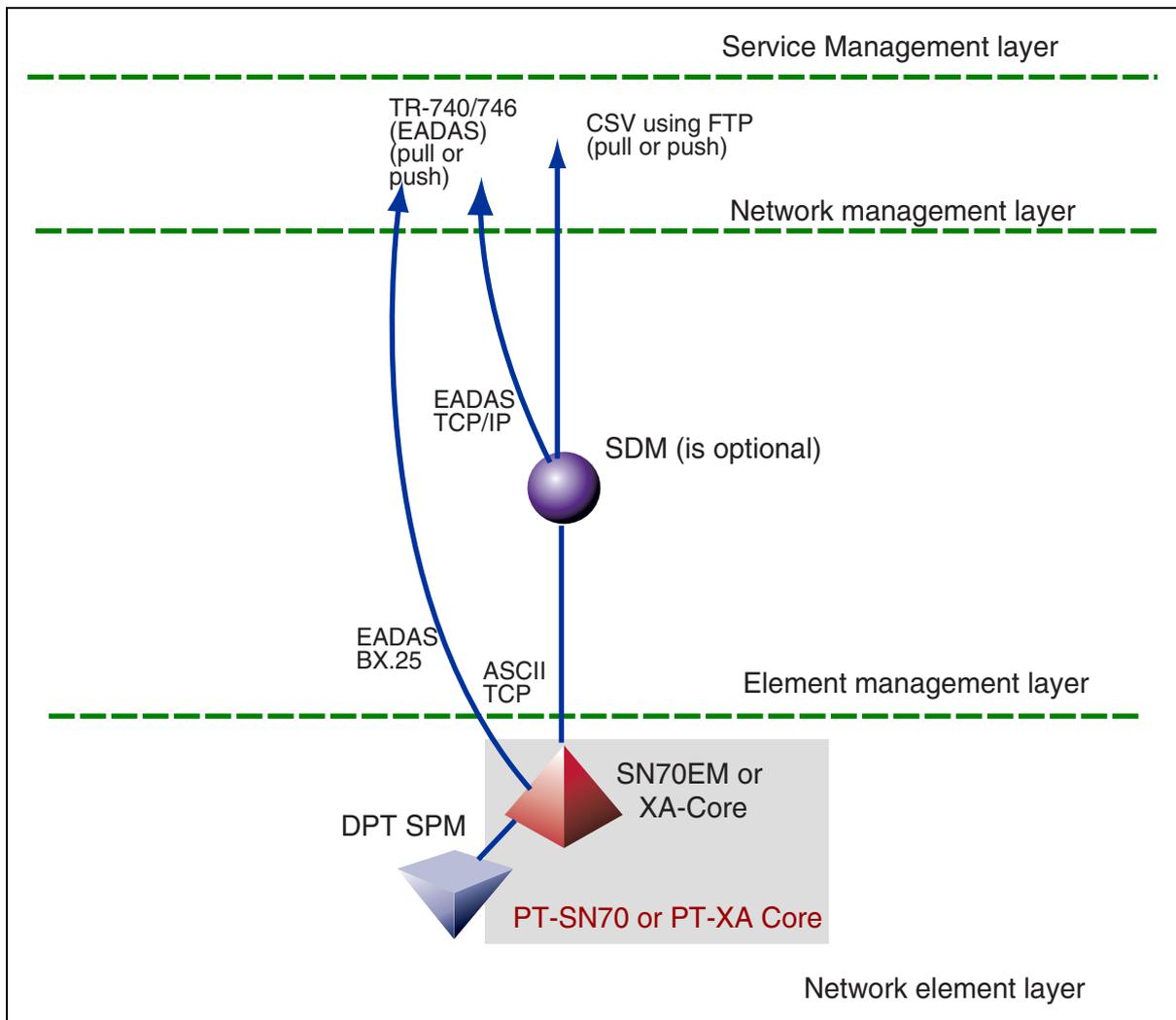
The figure Performance data collection for IP solutions with the CS 2000 architecture shows a high-level view of how performance data is collected from components in the various IP Solutions when the CS 2000 architecture is employed.

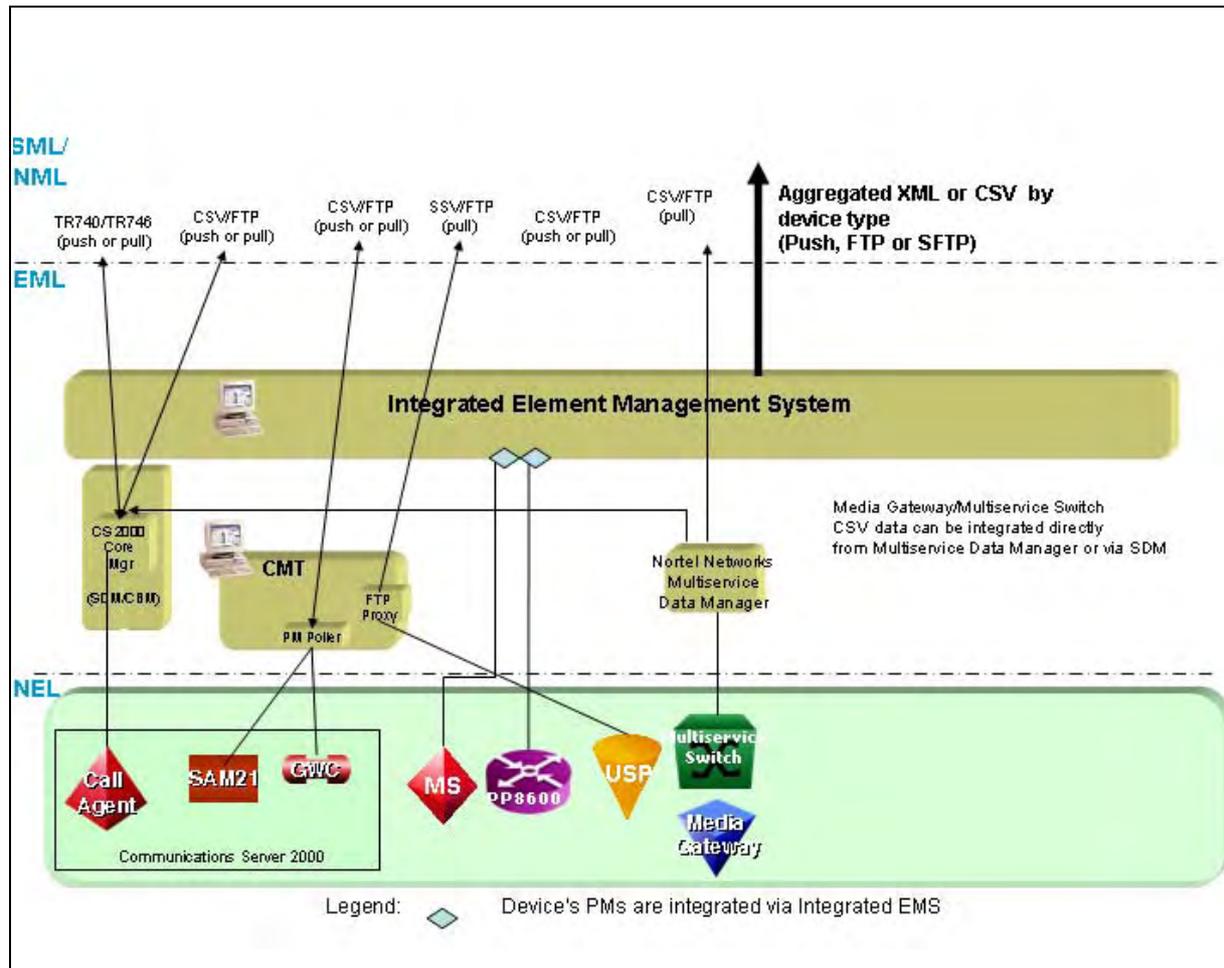## Performance data collection for IP solutions with the CS 2000 architecture
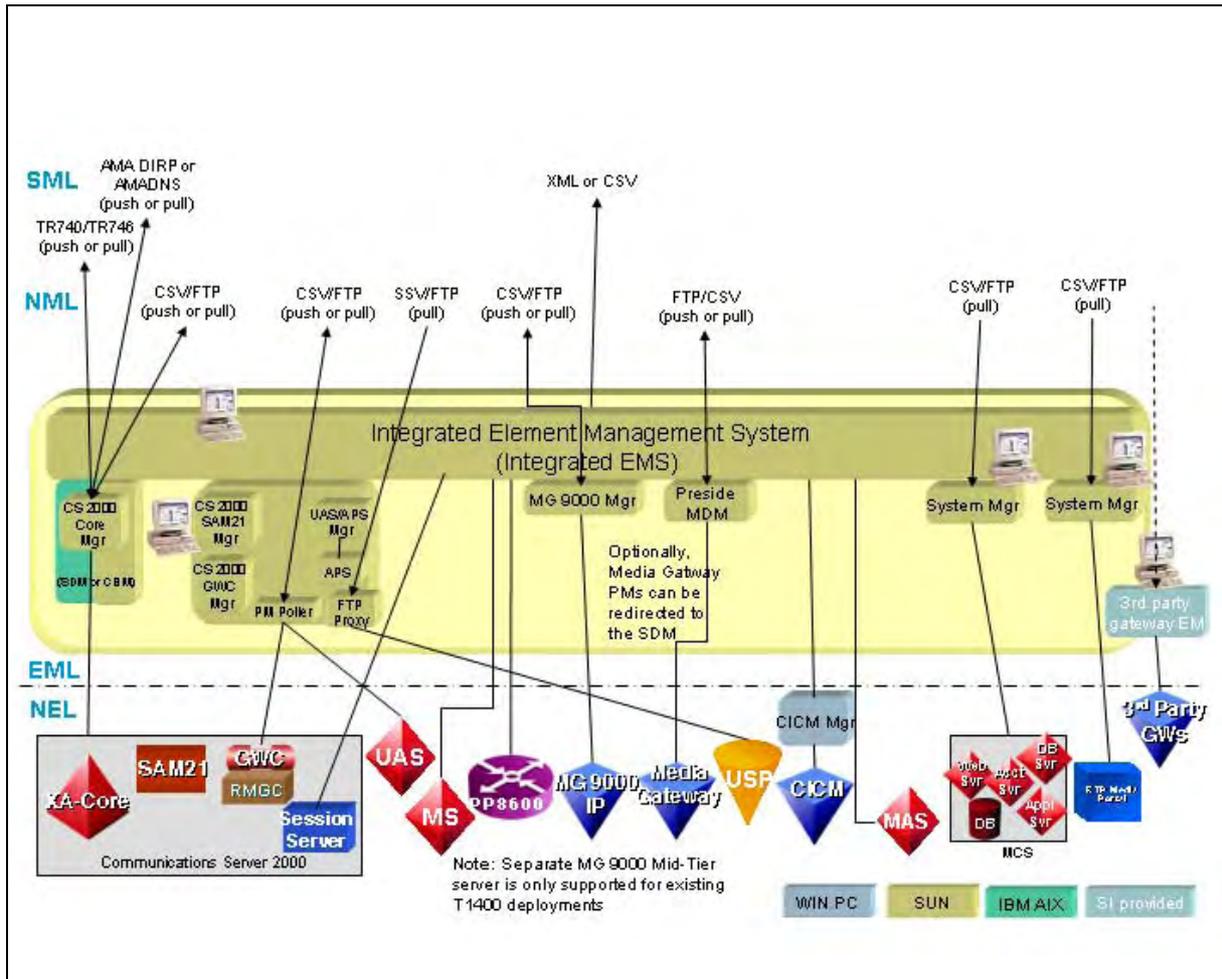
The figure Performance data collection for IP solutions with the CS 2000-Compact architecture shows a high-level view of how performance data is collected from components in the various IP Solutions when the CS 2000-Compact architecture is employed.

Performance data collection for IP solutions with the CS 2000-Compact architecture
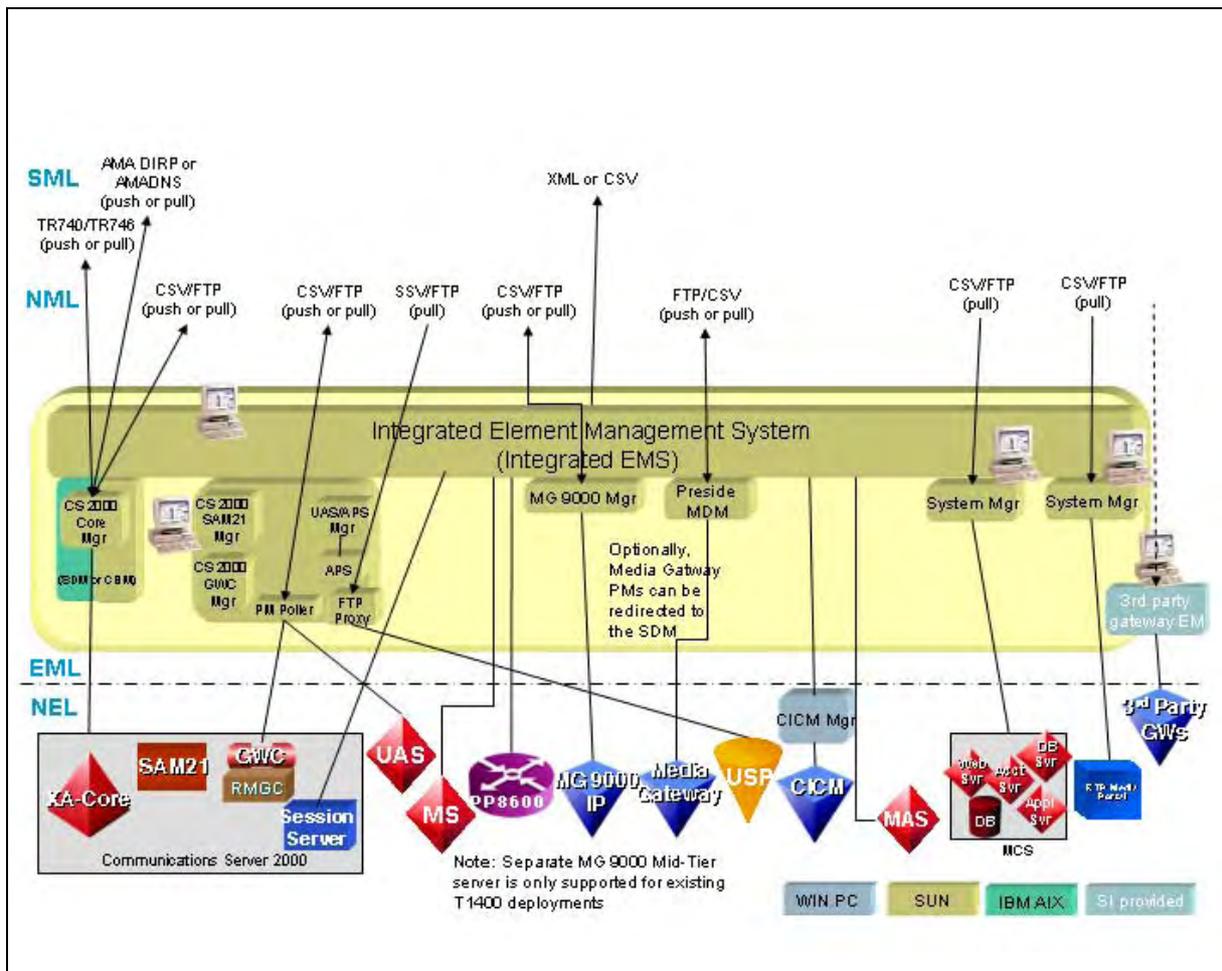
The figure Performance data collection for the PT-AAL2 solution shows a high-level view of how performance data is collected from components in the PT-AAL2 solution.

Performance data collection for the PT-AAL2 solution

The following tables provide a summary of how performance data is collected for each solution.

The table Performance data collection IP solutions with CS 2000 provides a summary of how performance data is collected for the PT-AAL1 solution. This table lists each component for the PT-AAL1 solution, tells whether the performance data feed is fetched or pushed from the OSS, indicates the type of feed, and identifies the reporting mechanism.

Performance data collection for PT-AAL1 (Sheet 1 of 2)

PT-AAL1 component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
CS 2000 (XA-Core)	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Push or pull	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
Multiservice Switch 15000	Pull or push	FTP	Data goes to Preside MDM (in CSE format) then is passed to CS 2000 Core Manager, then on to the OSS in CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
MG 4000 (available in North American solutions only)	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746

Performance data collection for PT-AAL1 (Sheet 2 of 2)

PT-AAL1 component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
	Push or pull	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
IW SPM ATM	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Push or pull	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
DPT SPM ATM	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Push or pull	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746

The table <u>Performance data collection with CS 2000-Compact</u> provides a summary of how performance data is collected for the UA-AAL1 solution. This table lists each component for the UA-AAL1 solution, tells whether the performance data feed is fetched or pushed from the OSS, indicates the type of feed, and identifies the reporting mechanism.

Performance data collection for UA-AAL1 (Sheet 1 of 3)

UA-AAL1 component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
CS 2000 (XA-Core)	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Pull or push	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
CS 2000 SAM21	Pull	FTP	PM Poller collects IPOA OMs from CS 2000 SAM21 Shelf Controller: CSV format
CS 2000 GWC	Pull	FTP	MAPCI using OMSHOW or the OMD application at the CS 2000 Core Manager, and PM Poller: CSV format
Passport 8600 (CS LAN)	Pull	SNMP	Device Manager
UAS	Pull	FTP	UAS Manager (real-time display), or PM Poller: CSV format
USP	Pull	FTP	USP Manager: SSV format

Performance data collection for UA-AAL1 (Sheet 2 of 3)

UA-AAL1 component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
Multiservice Switch 15000	Pull or push	Binary (FMIP), TCP/IP, FTP	Data is pushed to Preside MDM using binary (FMIP) at the end of the five minute period. From Preside MDM, the CSV format data is pushed to the CS 2000 Core Manager using TCP/IP, or pulled directly from Preside MDM using FTP.
MG 9000 (UA-AAL1, UA-IP, and Int'l UA-IP only)	Pull	FTP	MG 9000 Manager: CSV format
MG 4000	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Pull or push	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
IW SPM ATM	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746

Performance data collection for UA-AAL1 (Sheet 3 of 3)

UA-AAL1 component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
	Pull or push	BX.25 permanent virtual circuit (PVC)	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
MS 2000	Pull	SNMP	PM Poller: CSV format

The table Performance data collection for PT-SN70 or PT-XA Core provides a summary of how performance data is collected for the PT-SN70, or PT-XA Core solutions. This table lists each component for the PT-SN70, or PT-XA Core solutions, tells whether the performance data feed is fetched or pushed from the OSS, indicates the type of feed, and identifies the reporting mechanism.

Performance data collection for PT-SN70 or PT-XA Core

ATM component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
SN70EM or XA-Core	Pull or push	FTP	SDM or MAPCI: CSV format
	Pull or push	BX.25 PVC	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the SDM. File format TR-740/746
DPT SPM	Pull or push	FTP	SDM CSV format
	Pull or push	BX.25 PVC	EADAS OMs are available at the OSS using a live feed from the MPC card on the IOC. File format TR-740/746
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the SDM. File format TR-740/746
Note: For PT-SN70 and PT-XA Core, the SDM is optional.			

The table Performance data collection IP solutions with CS 2000 provides a summary of how performance data is collected for the IP solutions when a CS 2000 architecture is employed. This table lists each component for the IP solutions. This table indicates whether the performance data feed is fetched or pushed from the OSS, indicates the type of feed, and identifies the reporting mechanism.

Performance data collection IP solutions with CS 2000 (Sheet 1 of 3)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
CS 2000 (XA-Core)	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Pull or push	BX.25 permanent virtual circuit (PVC)	Third-party computer at the OSS connected to the XA-Core MPC card at the IAC. File format TR-740/746
CS 2000 SAM21	not applicable	not applicable	CS 2000 SAM21 does not provide performance management data
CS 2000 GWC	Pull	SNMP	Performance measurements from MIB-based counters are viewed at the CS 2000 GWC Manager (real time), and PM Poller: CSV format. In addition, some OM data relating to CS 2000 GWC capacity and overload conditions is sent to the CS 2000.
Passport 8600 (CS LAN)	Pull	SNMP	Device Manager

Performance data collection IP solutions with CS 2000 (Sheet 2 of 3)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
UAS	Pull	SNMP	UAS Manager (real-time display), or PM Poller: CSV format. **Note:** Data for UAS QoS OMs are pulled by the CS 2000 GWC and sent to the QoS Collector Application, then forwarded to the OSS as IPDRs (real-time streaming or in an IPDR file)
Media Gateway 7480/15000 (Media Gateway 7480 is part of Int'l solutions only)	Pull	Binary (FMIP) using FTP	Data is pushed to Preside MDM using binary (FMIP) at the end of the five minute period. Preside MDM: The OSS receives CSV files from the Preside MDM (FTP - pull only) CS 2000 Core Manager: The OSS receives CSV files (FTP - pull or push) from the CS 2000 Core Manager. **Note 1**: Data for Media Gateway 7480/15000 QoS OMs are pulled by the CS 2000 GWC and sent to the QoS Collector Application then forwarded to the OSS as IPDRs (real-time streaming or in an IPDR file). **Note 2**: Data for a single Media Gateway 7480/15000 QoS OM is pulled by CS 2000 GWC and sent to the CS 2000 where the data can be viewed on the MAPCI or written to CSV files and sent to the OSS by the CS 2000 Core Manager.

Performance data collection IP solutions with CS 2000 (Sheet 3 of 3)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
Multimedia Terminal Adapter (MTA) (IAC and Int'l IAC solution only)	Pull		MTA QoS OMs are pulled by the CS 2000 GWC and sent to the QoS Collector Application then forwarded to the OSS as IPDRs (real-time streaming or in an IPDR file)
USP	Pull	SNMP	USP Manager: SSV format
MG 9000 (UA-AAL1, UA-IP, and Int'l UA-IP only)	Pull	SNMP	MG 9000 Manager: CSV format
IW SPM IP (PT-IP, Int'l PT-IP, Int'l UA-IP and IAC only)	Pull or push	FTP	CS 2000 Core Manager: CSV format
MS 2000	Pull	SNMP	PM Poller: CSV format
CICM	Pull or push	FTP	XML or CSV
Session Server	Push	FTP	Integrated EMS integrated feed in XML or CSV format
Media Application Server MAS	Push	FTP	Integrated EMS integrated feed in XML or CSV format
RTP Media Server	Push	FTP	Integrated EMS integrated feed in XML or CSV format
Multimedia Communication Server (MCS)	Push	FTP	Integrated EMS integrated feed in XML or CSV format

The table Performance data collection with CS 2000-Compact provides a summary of how performance data is collected for the IP solutions when the CS 2000-Compact architecture is employed. This table lists each component for the IP solutions, tells whether the performance data feed is fetched or pushed from the OSS, indicates the type of feed, and identifies the reporting mechanism.

Performance data collection with CS 2000-Compact (Sheet 1 of 4)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
CS 2000 (XA-Core)	Pull or push	FTP	CS 2000 Core Manager: CSV format
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
	Pull or push	BX.25 permanent virtual circuit (PVC)	Third-party computer at the OSS connected to the XA-Core MPC card at the IAC. File format TR-740/746
CS 2000-Compact	Pull or push	FTP	CS 2000 Core Manager: call processing performance data in CSV format
	Not applicable	Not applicable	Call Agent Manager with tpcmtc application allows viewing of memory and processor usage for the Call Agent
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746

Performance data collection with CS 2000-Compact (Sheet 2 of 4)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
CS 2000 SAM21	not applicable	not applicable	CS 2000 SAM21 does not provide performance management data
CS 2000 GWC	Pull	SNMP	MAPCI using OMSHOW or the OMD application at the CS 2000 Core Manager, and PM Poller: CSV format. In addition, some OM data relating to CS 2000 GWC capacity and overload conditions is sent to the CS 2000.
Passport 8600 (CS LAN)	Pull	SNMP	Java Device Manager (JDM)
MS 2000	Pull	SNMP	PM Poller: CSV format
UAS	Pull	SNMP	UAS Manager (real-time display), or PM Poller: CSV format *Note:* Data for UAS QoS OMs are pulled by the CS 2000 GWC and sent to the QoS Collector Application, then forwarded to the OSS as IPDRs (real-time streaming or in an IPDR file).

Performance data collection with CS 2000-Compact (Sheet 3 of 4)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
Media Gateway 7480/15000 (Media Gateway 7480 is part of Int'l solutions only)	Pull	Binary (FMIP) using FTP	Data is pushed to Preside MDM using binary (FMIP) at the end of the five minute period Preside MDM: The OSS receives CSV files from the Preside MDM (FTP - pull only) CS 2000 Core Manager: The OSS receives CSV files (FTP - pull or push) from the CS 2000 Core Manager. *Note 1*: Data for Media Gateway 7480/15000 QoS OMs are pulled by the CS 2000 GWC and sent to the QoS Collector Application then forwarded to the OSS as IPDRs (real-time streaming or in an IPDR file). *Note 2*: Data for a single Media Gateway 7480/QoS OM is pulled by CS 2000 GWC and sent to the CS 2000 where the data can be viewed on the MAPCI or written to CSV files and sent to the OSS by the CS 2000 Core Manager.

Performance data collection with CS 2000-Compact (Sheet 4 of 4)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
Multimedia Terminal Adapter (MTA) (IAC and Int'l IAC solutions only)	Pull		MTA QoS OMs are pulled by the CS 2000 GWC and sent to the QoS Collector Application then forwarded to the OSS as IPDRs (real-time streaming or in an IPDR file)
USP	Pull	SNMP	USP Manager: SSV format
MG 9000 (UA-AAL UA-IP, and Int'l UA-IP only)	Pull	SNMP	MG 9000 Manager: CSV format
IW SPM IP (PT-IP, Int'l PT-IP, Int'l UA-IP and IAC only)	Pull or push	FTP	CS 2000 Core Manager: CSV format
CICM	Pull or push	FTP	XML or CSV
Session Server	Push	FTP	Integrated EMS integrated feed in XML or CSV format
Media Application Server (MAS)	Push	FTP	Integrated EMS integrated feed in XML or CSV format
RTP Media Server	Push	FTP	Integrated EMS integrated feed in XML or CSV format
STORM	Push	FTP	Integrated EMS integrated feed in XML or CSV format

The table Performance data collection for the PT-AAL2 solution provides a summary of how performance data is collected for the PT-AAL2 solution. This table lists each component for the PT-AAL2 solution, tells whether the performance data feed is fetched or pushed from the OSS, indicates the type of feed, and identifies the reporting mechanism.

Performance data collection for the PT-AAL2 solution (Sheet 1 of 3)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
CS 2000-Compact	Pull or push	FTP	CS 2000 Core Manager: call processing performance data in CSV format
	Not applicable	Not applicable	Call Agent Manager with tpcmtc application allows viewing of memory and processor usage for the Call Agent
	Pull or push	TCP/IP	EADAS OMs are available at the OSS using the GR740 Pass Through Application on the CS 2000 Core Manager. File format TR-740/746
CS 2000 SAM21	not applicable	not applicable	CS 2000 SAM21 does not provide performance management data
CS 2000 GWC	Pull	SNMP	MAPCI using OMSHOW or the OMD application at the CS 2000 Core Manager, and PM Poller: CSV format. In addition, some OM data relating to CS 2000 GWC capacity and overload conditions is sent to the CS 2000.

Performance data collection for the PT-AAL2 solution (Sheet 2 of 3)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
Passport 8600 (CS LAN)	Pull	SNMP	Java Device Manager (JDM)
MS 2000	Pull	SNMP	PM Poller: CSV format
USP	Pull	SNMP	USP Manager: SSV format
CICM	Pull or push	FTP	XML or CSV
Media Gateway 7480/15000 (Media Gateway 7480 is part of Int'l solutions only)	Pull	Binary (FMIP) using FTP	Data is pushed to Preside MDM using binary (FMIP) at the end of the five minute period Preside MDM: The OSS receives CSV files from the Preside MDM (FTP - pull only) CS 2000 Core Manager: The OSS receives CSV files (FTP - pull or push) from the CS 2000 Core Manager. *Note:* Media Gateway in the PT-AAL2 solution, does not support TRK QoS OM or QCA.

Performance data collection for the PT-AAL2 solution (Sheet 3 of 3)

Component (network element)	Pull or push	Type of feed	Reporting mechanism and file format of performance data
Multiservice Switch 15000	Pull or push	Binary (FMIP), TCP/IP, FTP	Data is pushed to Preside MDM using binary (FMIP) at the end of the five minute period. From Preside MDM, the data is pushed to the CS 2000 Core Manager using TCP/IP, or pulled directly from Preside MDM using FTP.

Integrated Element Management System performance overview

The Integrated Element Management System (Integrated EMS) performance module enables the user to create templates, collect data, generate reports, and transfer data and report files from the supported EMS modules and NEs to the OSS.

Integrated EMS offers a scheduler that allows data collection to take place at specified user-configured time intervals. Based on the time interval given, the scheduler schedules the data collection process. The scheduler can also schedule periodic reports to be generated. Based on the settings, the user can specify which report should be generated, when, and how often. The scheduler also allows the user to specify table cleanup and periodic table deletion.

Integrated EMS integrates performance feeds from multiple EMSs. Comma separated (CSV) and XML protocols are supported to enable integration with most performance systems.

Performance thresholds can be set to predefined performance levels. Performance reports can be customized. The system generates historical and current data. Reports can be customized according to data selection, how the data is grouped, and presentation of the data.

For more information on the Integrated EMS performance base, see *Integrated EMS Performance Management*, NN10327-711.

Performance management for CS 2000 components

This section provides a more detailed discussion of performance management for the ATM and IP solutions. The following topics are covered in this section:

Operational measurements (CS 2000 architecture)

Operational measurements (OMs) are measurements of the performance and traffic load of the CS 2000, CS 2000 GWC, IW SPM, MG 4000, DPT SPM, SN70EM or XA Core, MAS, and USP.

Note 1: Only QoS OMs are collected from the Media Gateway 7480, Media Gateway 15000, and the UAS. In addition, for the IP solutions, performance data for a single TDM trunk-based OM group (TRKQOSOM) is collected from the Media Gateway 7480 and Media Gateway 15000. TRKQOSOM can be viewed from the MAPCI and the CS 2000 Core Manager forwards the OM data in CSV format. All other Media Gateway 7480, Media Gateway 15000, and UAS performance data is in the form of PMs.

Note 2: The MG 9000 provides a limited amount of OM performance data that is collected by the CS 2000 GWC (DTSR and CES OMs) and is forwarded to the CS 2000. Most MG 9000 OMs are collected and viewed at the MG 9000 Manager and the OSS

Note 3: For the CS 2000 GWC, most performance data is MIB-based PMs that are viewed at the CS 2000 GWC Manager, or in the PM Poller CSV files. However, the CS 2000 GWC does provide a limited amount of performance data for a few OM groups that deal with overload conditions and CS 2000 GWC capacity. This CS 2000 GWC OM data is sent to the CS 2000 where it can be viewed at the MAPCI, or it is sent to the OSS by way of the CS 2000 Core Manager.

Note 4: USP OMs are pulled directly to an OSS by means of the File Transfer Protocol (FTP) and are not routed to the CS 2000 Core Manager. USP OMs are not merged with CS 2000 or CS 2000-Compact OMs. The USP exports operation measurement in the Semicolon Separated Value (SSV) format.

OMs are continually updated by the system in order to give a current view of the health and throughput of a switch. OMs collect two kinds of measurements from applications running on the switch:

- events

- states

Every time an event occurs, the system increases a peg count, and the event is said to be pegged. For example, when an Interworking Spectrum peripheral module (IW SPM) changes state from in-service to system busy, an OM register is incremented by one.

States are measured regularly by the system, and used to update usage counts. Periodic sampling of states is based on a 100-second cycle (slow), or a 10-second cycle (fast) scan.

Specific performance parameter counts are collected in registers and related registers are arranged together in an OM group. The collection interval period can be changed from between 5 to 30 minutes, through office parameter settings. One minute before the end of the collection interval, all active registers become holding registers and the active registers are cleared.

OMs for the CS 2000, IW SPM, CS 2000 GWC, Media Gateway 7480, Media Gateway 15000, MG 4000, and MG 9000 DPT SPM, MSN70EM, are collected at the network element level and transferred to the SN70EM or XA-Core for viewing from a MAP level. The OMs can be viewed on the MAP by typing OMSHOW at the CI level. When using

OMSHOW to view OM data, the active registers usually display zeros except for the last minute of the collection period.

These OMs can also be retrieved by the CS 2000 Core Manager OM Delivery application. The OMs are grouped into user-defined report elements, formatted into CSV format, and delivered to a customer OSS The OMD application writes the OMs to CSV files locally on disks at the CS 2000 Core Manager (or SDM). The CSV files can be transferred outbound (based on a set schedule) or left on the disks for collection by file transfer protocol (FTP) requests from the OSS.

The following table shows where the OMs for each component can be viewed.

Component	MAP	OSS	QoS Collector
CS 2000	X	X	
IW-SPM	X	X	
CS 2000 GWC	X	X	
Media Gateway 7480 (See Notes 3 and 4)	X	X	X
Media Gateway 15000 (See Notes 3 and 4)	X	X	X
Media Server 2000		X	
MG 4000	X	X	
MG 9000 (See Note 1)	X	X	
DPT SPM	X		
USP (See Note 2)		X	
SN70EM	X		

Component	M A P	O S S	QoS Collector
UAS (See Note 3)		X	X

Note 1: Only a subset of MG 9000 OMs are collected with CS 2000 (or CS 2000-Compact) OMs. Most MG 9000 OMs are collected and viewed at the MG 9000 Manager and the OSS.

Note 2: USP OMs are pulled directly to an OSS by means of the File Transfer Protocol (FTP) and are not routed to the CS 2000 Core Manager. USP OMs are not merged with CS 2000 or CS 2000-Compact OMs. The USP exports operation measurement in the Semicolon Separated Value (SSV) format.

Note 3: Media Gateway 7480/15000, and UAS provide QoS OMs that can be viewed at the QoS Collector Application or at the OSS.

Note 4: Media Gateway 7480/15000 using the PT-AAL2 solution, does not support QoS OM or QCA.

Note 5: OMs for the following can be viewed on Integrated EMS: Session Server, CICM, CICM Manager, Media Application Server (MAS), Multimedia Communication Server (MCS) Manager, Media Server 2000, and Passport 8600.

Note: For more information, refer to the *DMS-100 Family North American DMS-100/200 Operational Measurements Reference Manual*, 297-8021-814.

Impact of Packet Trunking-IP, Packet Transit-IP, UA-AAL1 or PT-AAL1 on the fixed loss plan

Echo in the end office is controlled by inserting an increasing amount of loss on the connections as the connection delay increases, up to the point where ECAN (echo cancellation) is required.

The Fixed Loss Plan provides guidelines for the amount of loss needed for each type of connection based on the length of the connection. The standard loss values are 0 dB, 3 dB, and 6 dB.

PT-IP and UA-AAL1 and PT-AAL1 affect the Fixed Loss Plan due to the larger delays incurred by packetization. A connection that traverses the

packet network has the equivalent delay of 1000 miles of cable even if the connection is physically confined to a single office.

Note: Loss is implemented at the end office, not at the tandem office (see the figure Loss is implemented at the end office).

Therefore any end office connection that traverses a packet network without ECAN should be provisioned with the maximum amount of additional loss (6 dB), consistent with the loss plan and regardless of physical distance.

Note: If you apply ECAN to a trunk or trunk group and a voice band modem call comes through, the echo canceller recognizes the answer tone from the answering modem. The answer tone is a 2100 Hz tone with period phase reversals. The echo canceler then goes clear channel analog, and therefore does not affect the modem or data rate.

Loss is implemented at the end office
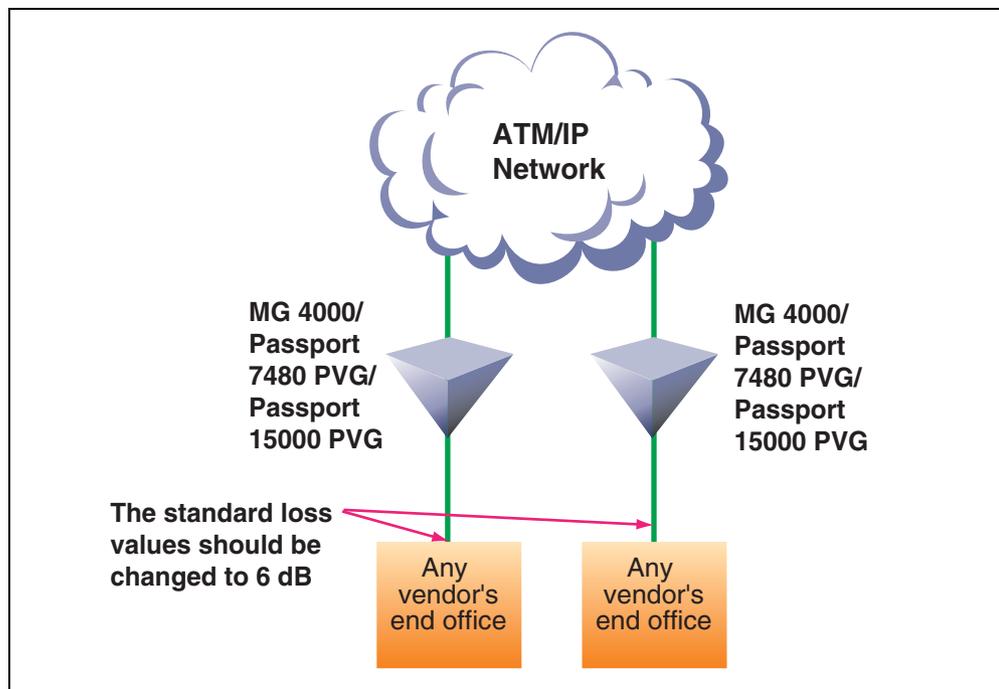
Performance management for Passport 8600 (IP solutions and UA-AAL1)

Passport 8600 performance is managed by the Device Manager. Device Manager allows you to perform the following performance management functions:

- configure performance data collection
- retrieve performance data collection
- view the performance data collection

For additional information on the Passport 8600, see *Managing the Passport 8000 Series Switch Using Device Manager*, 313195A, *Managing the Passport 8000 Series Switch Using the Command Line Interface Release 3.2, 313194*A, and *Networking Concepts for the Passport 8000 Series Switch*, 313196A.

Performance management for Multiservice Switch 15000 (ATM solutions)

Multiservice Switch 15000 performance is measured using the Preside Multiservice Data Manager (MDM). Each Multiservice Switch shelf collects its statistics every five minutes and sends them to each Preside MDM that collects PM statistics. Preside MDM then converts the Multiservice Switch node input into CSV format records and creates files for the five minute data. These five minute summaries are also merged into 30 minute records (in CSV format), by the Preside MDM, to provide the OSS with a historical view of the network. Five minute and 30 minute performance summaries (in CSV format) are sent from the Preside MDM to the CS 2000 Core Manager. From the CS 2000 Core Manager, this data is pushed or pulled to the OSS using FTP.

For more information on Multiservice Switch 15000 performance, refer to *Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Performance (PT-AAL1/UA-AAL1/UA-IP)*, NN10158-711.

Performance management for Media Gateway 7480/15000 (IP solutions)

Each Media Gateway collects its statistics every 5 minutes and sends them to each Preside MDM that collects PM statistics.

For the Media Gateway 7480/15000, PMs can be viewed at the Preside Multiservice Data Manager (Preside MDM) or can be pulled or pushed to the OSS.

On Preside MDM, the Performance Measurements Stream Processor (PMSP) server application manages performance. The PMSP server application converts the statistics into 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 PMs.

Preside MDM transfers the data records directly to the OSS applications or to the CS 2000 Core Manager depending on the Succession Network configuration.

For more information, refer to *Nortel Networks Multiservice Switch 15000, Media Gateway 150000 and Preside MDM Performance*, NN10158-711.

In addition to the PMs described above, there are also quality of service (QoS) statistics reported by the Media Gateway 7480/15000 at the end of each TDM trunk call. (This functionality applies only to Media Gateway 7480/15000 in IP solutions with hardware that supports H.248 or ASPEN VSP3.) The CS 2000 GWC associated with these trunk calls passes on the statistics to the CS 2000, or CS 2000-Compact. When the QoS thresholds for packet loss, jitter and delay are exceeded for Media Gateway 7480/15000 trunk calls, registers for OM group TRKQOSOM are incremented by the CS 2000, or CS 2000-Compact system software. The name TRKQOSOM refers to trunk quality of service operational measurements.

As CS 2000 GWC based trunk calls are released, the QoS data for that call are compared to the QoS OM threshold values. If call data exceeds the QoS OM thresholds value for that statistic, the OM value associated with the appropriate CS 2000 GWC based-trunk group is incremented. QoS reporting does not record every violation of the QoS OM threshold, but rather provides a general indication of the QoS for the whole trunk group. In order to minimize network traffic during heavy call loads, a minimum of only 16 QoS OM threshold violations (in a 15 minute period) for that trunk group are guaranteed to be reported by the system even if many more occurred.

The thresholds values for packet loss, jitter, and delay are datafilled as office parameters in table OFCVAR. You can disable QoS reporting on any given CS 2000 GWC by using the GWC Manager. Once this is done, all the Media Gateways associated with that CS 2000 GWC no longer report end of call QoS statistics. This action disables QoS OM pegging for the Media Gateway 7480 and Media Gateway 15000 based trunk members that are datafilled on the affected CS 2000 GWC.

OM group TRKQOSOM contains entries for each GWC based trunk group that is datafilled in the CS 2000 or CS 2000-Compact. In order for a trunk group to appear in OM group TRKQOSOM, you must datafill table TRKMEM so that at least one member of the trunk group resides on a GWC. Each entry in OM group TRKQOSOM contains a CLLI (common-language location identifier) as well as threshold crossing counters for packet loss, jitter, and delay (or latency).

For more information on OM TRKQOSOM, see *Communication Server 2000 Performance Management*, NN10149-711.

In addition, the QoS Collector Application receives QoS statistics from the Media Gateway 7480/15000, MTA, and UAS. The data from these gateways are collected by the CS 2000 GWC and forwarded on to the QoS Collector application (see the [Quality of Service Collector Application](#)). The QoS statistics consists of metrics for packets sent, packets received, packet loss, octets sent, octets received, inter-arrival latency, and jitter.

Performance management for Media Gateway 9000

OMs for the MG 9000 statistics are displayed at the MG 9000 Manager at the Performance Statistics Browser. OMs are also sent to the OSS through the performance collector and formatter (PCF).

Note: Some OMs that originate at the MG 9000 are transmitted to the associated GWC and from there, are forwarded on to the CS 2000. OM DSTR (dial-tone speed recording) is an example. For more information, see *MG 9000 Performance Management*, NN10140-711.

The OMs for the MG 9000 are presented through the Performance Browser and are accessed by selecting the statistics tab for each OM category. When a resource is selected in the Performance Statistics Browser, all the statistics that are accumulated for that node are presented in the various statistics tabs available for selection.

The CSV OM file collection application or PCF for the MG 9000 resides in the element management layer. This Java-based application will

interface with both the device layer and the network management layer. The scope of the OMs to be collected involve only those that are part of the MG 9000 network. Further, the delivered OMs are a small subset of the overall OMs, which are either collectable or collected at the MG 9000 element manager (EM).

The user interface and configuration of the PCF application are text-based. After initial configuration of the list of devices to collect from, very little user interaction occurs with the collection application. Files are retrieved by an network management layer OSS application for data processing and analysis.

Input for the PCF application consists of the configuration file, a text file that contains a list of MG9000 devices that OMs are to be collected for. Any relevant configuration or status information will be contained in this file.

The output consists of two files generated when the PCF runs:

- The CSV text file.
- The Log text file. This file contains process information and any logs necessary for debugging purposes. The log will be created using Syslog if possible. At the time of this writing the debug logs are created using System.out print statements.

The following QoS OMs are generated by the MG 9000 and can be viewed using the MG 9000 Manager browser:

- Jitter
- Latency
- numPktsSent (the total number of packets sent in a 15 minute interval)
- PktsLost (the percentage of packets lost)
- numCalls (the total number of calls in a 15 minute interval)
- numBadCalls (the number of bad calls that exceeded threshold values in a 15 minute interval)

The MG 9000 Manger also allows you to configure the QoS threshold parameters.

For more information on MG 9000 Performance, refer to the *MG 9000 Performance Management*, NN10140-711.

Performance management for CS 2000 SAM21 (UA-AAL1)

You have the option of configuring the PM Poller (which is one of the CS 2000 Management Tools applications) to collect Internet Protocol over ATM (IPOA) operational measurements (OMs) from the CS 2000 SAM21 asynchronous transfer mode (ATM) Shelf Controller. The performance data collected by the PM Poller is made available to the operations support system (OSS) for further processing. See PM Poller in this document for additional information. For information on configuring the PM Poller to collect these IPOA OMs, see *ATM/IP Solution-level Configuration Management*, NN10409-500.

Performance management for CS 2000 Gateway Controller (IP solutions and UA-AAL1)

You can view OM data for the CS 2000 GWC on the MAP by typing OMSHOW at the CI level. OMs can also be retrieved by the CS 2000 Core Manager OM Delivery application.

Additional CS 2000 GWC performance data is available through the PM Poller. Refer to the PM Poller section below for more information.

Performance related data for the Kerberos application running on the GWC card is obtained by manually executing scripts on the CS 2000 Management Tools server. For more information see, *Gateway Controller Performance Management,* NN10208-711.

Some OMs that originate on gateways such as the MG 9000 are collected by the CS 2000 GWC and forwarded on to the CS 2000. For example, dial-tone speed recording (DTSR) OM collection for MG 9000s is done by CS 2000 GWCs. The statistics are collected by the CS 2000 GWC and then sent to the XA-Core.

For more information, refer to *Gateway Controller Performance Management,* NN10208-711, the *DMS-100 Family North American DMS-100/200 Operational Measurements Reference Manual,* 297-8021-814, or the *SDMC OM Delivery Application User Guide*, 297-2667-321.

Performance management for Session Server (PT-IP and Intl PT-IP solutions)

The Session Server records operational measurements (OMs) for various performance related data items. These OMs are essential information sources for determining preventive and corrective maintenance actions, as well as identifying provisioning problems or

capacity limitations. The majority of OMs are directly related to the SIP Gateway application running on the Session Server.

OMs are viewed using an available command line interface (CLI) accessed through a secure shell (SSH) connection to the Session Server or through Integrated EMS. OM data recorded on one unit of a Session Server is completely independent of data recorded on its mate unit. Data is not transferred from one unit to another during synchronization activities.

Operational measurements, related to SIP-T DPT call capacity limits and collected on the core, collect information related to current equipment and software load capacities, showing the load process for each SIP-T DPT trunk group. This data forecasts future equipment loading and determines future equipment requirements.

Operational measurements can indicate service level degradation for the Session Server based on alarms indicating that resources are running low. This information helps to determine the corrective action which can include equipment repair.

For more information, refer to *Session Server Performance Management,* NN13342-711.

Performance management for Universal Audio Server (IP solutions and UA-AAL1)

Performance measurements are collected through audio server component MIB-based counters and gauges. Counters are set to zero at system initialization and are incremented over time. When the maximum value allowed for the counter is reached, 4,294,967,295, the counter returns to zero. Gauges are similar to counters, but can also be decremented. UAS performance measurement information is configured for reporting and is retrieved through the UAS Manager.

Additional UAS Performance data is available through the PM Poller. Refer to the PM Poller section in this document.

In addition, for the IP solutions, the QoS Collector Application receives QoS statistics from the Media Gateway 7480, Media Gateway 15000, the Multimedia Terminal Adapter (MTA), and UAS. The data from these gateway are collected by the CS 2000 GWC and forwarded on to the QoS Collector application (see the Quality of Service Collector Application). The QoS statistics consists of metrics for packets sent, packets received, packet loss, octets sent, octets received, inter-arrival latency, and jitter.

For more information on Universal Audio Server performance, refer to the *Universal Audio Server Performance Management,* NN10139-711.

Performance management for the Universal Signaling Point (IP solutions and UA-AAL1)

The Universal Signaling Point (USP) uses operational measurements (OMs) to track activity on the USP system. The USP also uses special study operational measurements (SSOMs). The user can configure a number of SSOMs to study and track USP system issues that are not covered by the Nortel Networks-programmed OMs.

You can view USP OMs and SSOMs directly from USP Manager graphical user interface (GUI) or from the OSS. The USP Manager is an OAM&P application running on a Window 2000 or Window 95 PC. An Ethernet connection on the USP Manager allows you to export to the OSS, both the OMs and SSOMs, through an OM FTP Server. You can export OMs in 5 or 30 minute intervals.

For more information on the USP, see *USP Performance Management,* NN10137-711.

Performance management for SSPFS (IP solutions and UA-AAL1)

Overview

The Succession Server Platform Foundation Software (SSPFS) uses Management Information Base (MIB) performance measurements (PMs) to collect statistics. SSPFS-based performance measurements are defined in the sun-mib file.

The PMs in the sun-mib file are polled by the SNMP (simple network management protocol) PM poller. For more information on the PM poller, refer to the document from the list below that applies to your solution:

- *ATM Solutions Basics*, NN10320-100 (North America)

- *IP Solutions Basics* NN10300-100 (North America)

- *Packet Transit - AAL2 Solution-level Basics*, NN10049-100 (International)

- *Packet Transit - IP Solution-level Basics*, NN10050-100 (International)

Performance measurements

Performance measurements (PMs) are statistics collected about the system using MIB-based peg counters.

Refer to section , for a list of the SSPFS PMs collected by the PM poller.

Note 1: SNMP PM poller data comma separated value (CSV) output files are located in the "/data/oms" directory on the system.

Note 2: For procedures to add, configure or delete the SNMP PM poller, refer to *ATM/IP Solution-level Configuration Management*, NN10409-500.

SSPFS performance measurements
The following table contains the SSPFS performance measurements defined in the sun-mib file and collected by the PM poller.

Note: To view a description of each of the SSPFS performance measurements defined in the sun-mib file, refer to procedure Viewing sun-mib SNMP attribute definitions on an SSPFS-based server on page 77 in this document.

SSPFS performance measurements

MIB Objects	Attributes
IP group	
ipForwarding	ipOutDiscards
ipDefaultTTL	ipOutNoRoutes
ipInReceives	ipReasmTimeout
ipInHdrErrors	ipReasmReqds
ipInAddrErrors	ipReasmOKs
ipForwDatagrams	ipReasmFails
ipInUnknownProtos	ipFragOKs
ipInDiscards	ipFragFails
ipInDelivers	ipFramCreates
ipOutRequests	ipRoutingDiscards
IP Address Table	
ipAdEntAddr	ipAdEntBcastAddr
ipAdEntIfIndex	ipAdEntReasmMaxSize
ipAdEntNetMask	
Sun Host Performance group	
rsUserProcessTime	rsVPagesOut
rsNiceModeTime	rsVSwapIn
rsSystemProcessTime	rsVSwapOut
rsIdleModeTime	rsVIntr
rsDiskXfer1	rsIfInPackets
rsDiskXfer2	rsIfOutPackets
rsDiskXfer3	rsIfInErrors
rsDiskXfer4	rsIfOutErrors
rsVPagesIn	rsIfCollisions

Performance management for CS 2000-Compact components

This section provides a more detailed discussion of performance management for the IP solutions when used with the CS 2000-Compact architecture.

Performance management for the following CS 2000 Compact components is the same as for the CS 2000 architecture. For more information on the following CS 2000-Compact architecture components, see Performance management for CS 2000 components.

- Impact to PT-IP on the fixed loss plan (CS 2000-Compact architecture). For more information, see Impact of Packet Trunking-IP, Packet Transit-IP, UA-AAL1 or PT-AAL1 on the fixed loss plan.

- Passport 8600 (CS 2000-Compact architecture). For more information, see Performance management for Passport 8600 (IP solutions and UA-AAL1).

- Media Gateway 9000 (CS 2000-Compact architecture). For more information, see Performance management for Media Gateway 9000.

- CS 2000 Gateway Controller (CS 2000-Compact architecture). For more information, see Performance management for CS 2000 Gateway Controller (IP solutions and UA-AAL1)

- Universal Audio Server (CS 2000-Compact architecture). For more information, see Performance management for Universal Audio Server (IP solutions and UA-AAL1).

Operational measurements (CS 2000-Compact architecture)

The CS 2000 Compact consists of the Call Agent, STORage Management (STORM) card, CS 2000 GWC, Session Server, and the CS 2000 SAM21.

The MAPCI is the tool you use for monitoring the performance of the call processing functions of the Call Agent. Operational Measurements and MAP levels (such as Capacity MAP level) provide you with call processing performance data. The Capacity CI and Capacity MAPCI levels of the MAP contain call processing performance metrics that were introduced in (I)SN05.

Note: This section discusses the use of OMs for the CS 2000-Compact hardware and software. For information on the OM data generated by other components used with the

CS 2000-Compact see <u>Operational measurements (CS 2000 architecture)</u>.

OM data can be viewed on the MAP by typing OMSHOW at the CI level. When using OMSHOW to view OM data, the active registers usually display zeros except for the last minute of the collection period.

OMs (for the CS 2000-Compact and CS 2000 GWC) are collected at the network element level and transferred to the Call Agent for viewing from a MAP level. OMs can also be retrieved by the CS 2000 Core Manager OM Delivery application. 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).

Note: For more information, refer to the *DMS-100 Family North American DMS-100/200 Operational Measurements Reference Manual* 297-8021-814.

To monitor the performance of the CS 2000-Compact hardware and software platform, you use the Call Agent Manager. The tpcmtc application, of the Call Agent Manager, allows you to monitor statistics relating to the memory and processor usage of the Call Agent hardware and software platform.

For more information on the Capacity performance management (Capacity CI and Capacity MAPCI levels of the MAP), see *Call Agent Performance Management*, NN10153-711, and *Communication Server 2000 Performance Management,* NN10149-711. For information on using the call processing application operational measurements, see *DMS-100 Operational Measurements Reference Manual*, 297-8001-814.

The STORM System panel allows you to perform the following performance-related tasks for the STORM card:

- View alarm threshold information
- Modify thresholds for the STORM CPU usage
- Modify thresholds for the STORM zombie processes
- Modify thresholds for the STORM memory usage

For more information on using the STORM system panel, see *STORM Performance Management*, NN10154-711.

Performance management for the Universal Signaling point-Compact (CS 2000-Compact architecture)

The Universal Signaling Point-Compact (USP-Compact) resides on two identical blades in a CS 2000- Compact shelf. The USP-Compact uses operational measurements (OMs) to track activity on the USP system.

You can view USP OMs directly from USP Manager graphical user interface (GUI) or from the OSS. The USP Manager is an OAM&P application running on a Microsoft Windows 2000 or Microsoft Windows 95 PC. An Ethernet connection on the USP Manager allows you to export to the OSS, both the OMs and SSOMs, through an OM FTP Server. You can export OMs in 5 or 30 minute intervals.

For more information on the USP, see *USP-Compact Performance Management,* NN10138-711.

Tools and utilities

This section discusses tools and utilities for the solutions.

Each component within the solutions includes tools and utilities that you use for performance management. This section does not provide a comprehensive discussion of all the performance management tools available; however a brief discussion is given for the following tools:

- The Operational Measurement Delivery application
- EADAS Data Collection
- Performance monitoring statistics
- Carrier performance monitoring archival (PMA)
- PM Poller
- OMPUSH application
- Quality of Service Collector Application
- Log reports

For detailed information about performance tools and utilities for a specific component see the references found in the table ATM and IP solutions performance management documents, at the end of this document.

The Operational Measurement Delivery application

For the PT-SN70 or PT-XA Core architectures, the SDM is optional. If your switch does not include an SDM, then you use the MAPCI and the OMSHOW command to display OMs. You do not use the Operational Measurement Delivery (OMD) application. Therefore this topic does not apply to your switch.

The Operational Measurement Delivery (OMD) application, (one of the CS 2000 Core Manager applications (SDM)), delivers customer selected Operational Measurement data in Comma Separated Values (CSV). The OMD application allows you to:

- group related OMs together into report elements so they can be easily monitored and analyzed

- add registers to the specified OM group in the report element

- delete registers from the specified OM group in the report element

- select a subset of the registers in an OM group

- set the report interval to five minutes or to the office transfer period (15 or 30 minutes) for each report element

- display the existing OM groups for the specified report element while modifying the report element

- display the existing OM registers of the specified OM group while modifying the OM group

- select all of the registers of the specified OM group

- specify when to collect the OM data using data collection schedules

- specify when to rotate the report files using file rotation schedules

- specify when to send report files to a downstream processor and which remote directory to put them in using file transfer schedules

- link report elements, file rotation schedules, data collection schedules, and file rotation schedules together using report registrations

- store OM data to disk files which are available for transfer via Secure File Transfer (SFT) or file transfer protocol (FTP)

- configure the CS 2000 Core Manager to automatically recover previously entered report element configurations without any manual intervention in the event of a shutdown

- include the OM tuple number in the CSV file along with other OM information

The OMD application lets you collect OM data from the CS 2000 (or CS 2000-Compact), CS 2000 GWC, IW SPM, MG 9000, MG 4000, Media Gateway 7480, and Media Gateway 15000, SN70EM or XA-Core, and save the OM data to OM report files on the CS 2000 Core Manager. OM report files can be transferred from the CS 2000 Core Manager to the Operations Support System (OSS) automatically, by OMD, or manually using Secure File Transfer (SFT) or file transfer protocol (FTP).

> *Note 1:* For more information about SFT, refer to *CS 2000 Core Manager Performance Management, NN10148-711*, and refer to the *SDM Secure File Transfer User Guide*, 297-5051-913, and the *SuperNode Data Manager OM Delivery Application User Guide*, 297-5051-321.

> *Note 2:* You have the option of configuring the OMD application so that the tuple number, that is part of the OM group information, appears in the CSV file. The inclusion of the tuple number is an optional capability that you can activate or disable at any time by configuring the OMD application at the SDMmtc/Admin/SWIM/Config menu. For information on configuring OMD, see *CS 2000 Core Manager Configuration Management*, NN10104-511. For additional background information on the OMD application, see the *CS 2000 Core Manager Basics*, NN10018-111.

EADAS Data Collection

The Engineering and Administrative Data Acquisition System (EADAS) is an operational support system that provides near real-time data collection and surveillance. EADAS is a third-party alternative to Nortel Networks MAPCI and is based on Telecordia standard TR-746/740. The EADAS package has two components: EADAS Data Collection and EADAS Network Management.

Note: EADAS is not supported in the North American PT-AAL2 solution.

EADAS Data Collection (EADAS DC) software sends operational measurements (OM) data from the Succession office to an EADAS computer for processing and reporting. EADAS Data Collection collects data in three classes: 30-minute class; 60-minute class; and 24-hour class. Each class is divided into logical groups of measurements called sections. The maximum number of sections for the 60-minute class, and the 24-hour class is 255 (0 to 254). The maximum number of sections for the 30-minute class is either 255 or 999 (0 to 998).

For the CS 2000 architecture there are two methods for obtaining the EADAS live feed of data:

- through the Multiprotocol controller (MPC) card on the input/output controller (IOC)
- using the GR740 Pass Through application on the CS 2000 Core Manager

Note: For the CS 2000-Compact architecture, EADAS is only available by means of the GR740 Pass Through application on the CS 2000 Core Manager.

The feature titled: EADAS section ID extension for TDM and Succession, 59040445 gives you the option of expanding the number of sections for the 30-minute class to 999. Activation of this functionality is controlled by Software Optionality Control (SOC) OAM00013.

For additional information on this feature, see Nortel Networks functional description titled: EADAS section ID extension for TDM and Succession, 59040445.

Series Completion OM data for EADAS

Series Completion (SCMP) is a line option feature that directs calls from a busy directory number (DN) to another specified DN on the same switch. An SCMP OM group provides operational measurement

information for SCMP lines in the Succession switch. This OM group records the operational data for each SCMP line in a separate tuple using three OM registers: SCMP overflow (SCMPOVFL); SCMP attempt (SCMPATT); and SCMP usage (SCMPANSR).

All existing SCMP OMs are automatically added to the Engineering and Administrative Data Acquisition System (EADAS) once you issue the EADSECTS command. However, the office parameter EADAS_POPULATE_SCMP_ SECTIONS in table OFCVAR controls whether the system adds new SCMP tuples to EADAS. If the office parameter is set to the default value "Y" (yes), then the new SCMP records or tuples are added to EADAS OM class section 221. If the office parameter is set to "N" (no), then no new SCMMP records or tuples are added to EADAS. OM registers SCMPTRF, and SCMPMNT collect usage data for the SCMP lines.

For information on provisioning office parameters in table OFCVAR, see *Communication Server 2000 Configuration Management*, NN10193-511.

EADAS Data Collection for PT-SN70 and PT-XA Core

For EADAS data collection in the PT-SN70 (and PT-XA Core) architectures, the SDM is optional. If your PT-SN70 (and PT-XA Core) architecture does not include an SDM, then EADAS collects the performance data by way of a BX.25 data link. The data link has a single dedicated synchronous 24000 baud rate with three BX.25 permanent virtual circuits (PVC). The Multiprotocol controller car (MPC) in the I0C servers as the PT-SN70 (or PT-XA Core) hardware interface card.

Performance monitoring statistics

For SONET configurations, the STS-1 resource module (RM) generates performance statistics for the STS-1 line layer, STS-1 section layer, STS-1 path layer, VT1.5 path layer, and DS-1 path layer. The STS-1 RM gathers these performance monitoring parameters on a 15-minute daily interval for each in-service STS-1 carrier. The PerfMon MAP level and the sublevel commands PPQuery and SilML provide performance monitoring information on STS-1 carriers relating to STS-1 section and line.

Performance monitoring statistics for ATM connections on the DPT SPM for PT-SN70 and PT-XA Core

Performance monitoring information relating to the ATM interface and connections for the DPT SPM is read from various hardware components on the ATM (asynchronous transfer mode) RM (resource module) card. These are PM statistics and are gathered from the AAL1 layer, or the AAL5 layer, or the ATM layer and are reported on an aggregate basis or on a virtual circuit basis.

You can access ATM performance information using the following tools:

- the DMS Operational Measurement (OM) system

- MAP commands that report performance monitoring statistics for the current 15 minute period with options for aggregate counts and counts based on individual virtual circuits (VC).

ATMConn MAP commands for performance monitoring

The ATMConn MAP level and sublevels provide commands that allow you to obtain performance monitoring statistics for the ATM (asynchronous transfer mode) connections on the DPT SPM. You can query performance monitoring statistics at the ATM, AAL1, and AAL5 layers from the ATMConn MAP level and sublevels. For more information, see *DPT SPM ATM Performance Management*, NN10146-711.

Carrier performance monitoring archival (PMA)

Carrier performance monitoring information is collected for MG 4000 carriers and is stored on the core. The data is stored in formatted text files which can be easily printed directly to the terminal or uploaded to a PC or workstation for viewing with a text editor.

Multiple intervals may be stored in the same file, separated by the header information. The header consists of the version, date/time, and fields information. The following is the format for the files.

```
Version: 1.0
Date/Time: 7/28/2002 13:15:00.000
Fields: spm number, carrier number, carrier type,
performance parameter, value, (performance parameter
and value repeat until all performance parameters are
shown)
15,110,OC3S,LBC,150,OPT,90,OPR,92,SEFS,0,CV,0,ES,0,
SES,0
15,111,STS3L,CV,0,ES,0,SES,0,UAS,0
15,115,STS3CP,CV,0,ES,0,SES,0,UAS,0,CVFE,0,ESFE,0,S
ESFE,0,UASFE,0
16,40,VT15P,CV,0,ES,0,SES,0,UAS,0
```

Refer to *MG 4000 Performance Management,* NN10142-711 for more detailed information on Carrier PMA.

PM Poller

The PM poller collects performance attributes from several Succession based network elements (for example, UAS and CS 2000 GWC). The PM Poller is delivered as a sub-package with the CS 2000 Management Tools server software.

The PM Poller Server is the main poller process. It is responsible for launching (and stopping) the device SNMP pollers. The device pollers act as SNMP managers collecting performance data from the polled network devices at a configured polling interval. The data collected, devices the data is collected from, and the interval within which the data is collected, is based upon the profile configuration data. The Poller Server reads this configuration data during start-up of the poller. Upon collecting the pre-configured MIB data attributes from the polled devices, the data is stored in Comma Separated Value (CSV) format in files on the CS 2000 Management Tools server. These files can be viewed locally on the SSPFS server or can be retrieved from the CS 2000 Management Tools server for further review using standard File Transfer Protocol (FTP).

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 contain 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 will occur 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 (that is, files in directory 6 are moved to directory 7, 5 to 6, and so on).

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.<ReportName>.Year.Mon.Dat
e_HR.MN_<TZ>.csv
```

>   where

>   **NodeType**
>   is the node type (GWC, UAS, etc.)

>   **NodeName**
>   is a unique node name

>   **ReportName**
>   correlates to the associated profile name

>   **TZ**
>   is the timezone

An example file name is provided below:

```
GWC.GWC-10_UNIT_1.OMs.GWC.2002.05.02_10.52_EDT.csv
```

The CSV files can be viewed locally on the CS 2000 Management Tools server by using a standard text editor. Alternately the CS 2000 Management Tools server is configured with an snmp-poller ftp userid. You can utilize the FTP to retrieve the CSV output data files for further analysis. When the snmp-poller ftp userid is used to ftp into the CS 2000 Management Tools server, the home directory for this account is the file oms output directory. For security reasons the snmp-poller ftp user only has access the output directory and its sub-directories.

For more information on the PM Poller in international solutions, refer to *Packet Transit - AAL2 Solution-level Basics,* NN10049-100, and *Packet Transit - IP Solution-level Basics,* NN10050-100.

For more information on the PM Poller in North American solutions, refer to the *ATM Solutions Basics*, NN10320-100 and *IP Solutions Basics*, NN10300-100.

OMPUSH application

> **ATTENTION**
> The OMPUSH application is applicable to the PT-AAL2, Int'l PT-AAL2 and UA-AAL1 solutions.

The OMPUSH application is used to transfer OM files to predefined remote servers by FTP or SFTP. There are two types of OM files pushed by OMPUSH:

• MG 9000 OM files generated by the MG 9000 OM Collector

• SSPFS, GWC, UAS, and SAM21 SC OM files collected by the PM Poller application

Note: All OM files need to reside on the same machine for the OMPUSH application.

The OMPUSH application supports a maximum of six file push sessions. Each session is responsible for sending OM files to one destination periodically. The application has its own destination server, destination directory, login user, password, push interval, source of OM files, and file transfer mode.

Quality of Service Collector Application

The Quality of Service (QoS) Collector Application is available for all IP solutions.

Note: This tool is not supported for the PT-AAL2 solution.

The QoS Collector Application is one of the software tools included in the CS 2000 Management Tools suite, and is part of the CS2M (CS 2000 Management Components) non-CM load (NCL) software package. The QoS Collector Application can run on the same Sun Netra t14000 on which the Succession Element and Sub-Network Manager (SESM) software is running, and is contained in an operations, administration, and maintenance equipment (OAME) frame.

The QoS Collector Application receives QoS statistics from the Media Gateway 7480, Media Gateway 15000, the Multimedia Terminal Adapter (MTA), and Universal Audio Server (UAS). The data from these gateway are collected by the CS 2000 GWC and forwarded on to the QoS Collector application (see the figure QoS reporting for IP Solutions). The QoS statistics consists of metrics for packets sent, packets received, packet loss, octets sent, octets received, inter-arrival latency, and jitter.

QoS reporting for IP Solutions
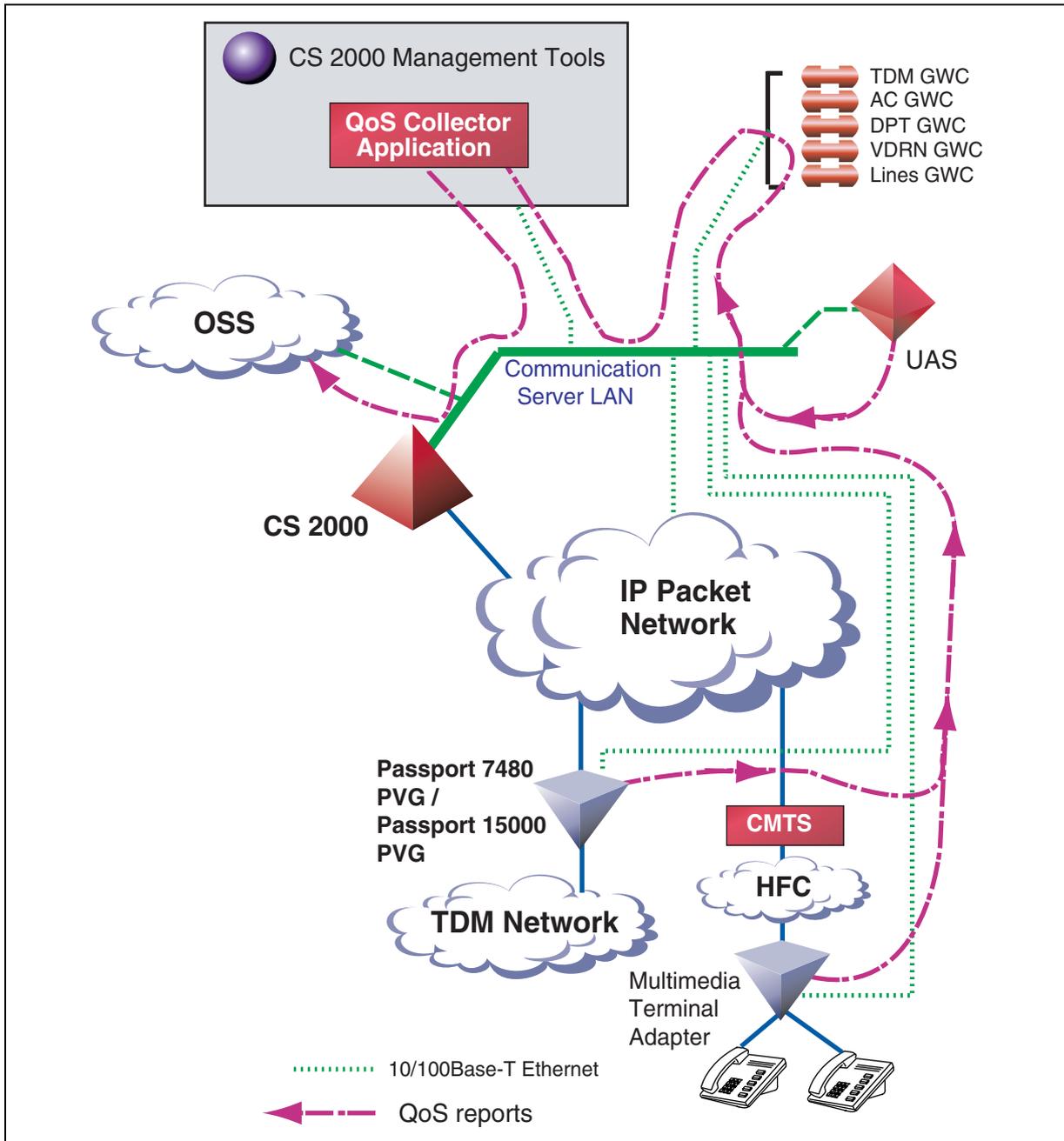
At the end of every call, the QoS Collector Application receives binary QoS records from the GWCs and validates the records, ensuring the record sequence number, version, and length are correct. The QoS Collector Application then converts these records to Internet Protocol Detail Records (IPDR). The IPDRs are then written to a file. All IPDRs are stored on the Qos Collector Application host (a Sun Netra t1400).

The IPDRs can be forwarded to the OSS for processing. The output format of the QoS Collector Application data is a single stream (file) of IPDR Version 3.1-A.0.2 compliant records.

The maximum size of a QCA IPDR record is 840 characters, which is equal to 840 bytes (using UTF-8 encoding).

All gateways (GW) that have a QoS capability that is enabled report QoS statistics. The GWs that are supported are listed below:

- UAS (H.248)

- Motorola CG4500 (NCS)

- Media Gateway (Aspen/VSP2)

- Media Gateway (Aspen/VSP3)

- Media Gateway (VSP3-o)

- Media Gateway (H.248)

- Arris PacketPort (MGCP)

- Askey

- CICM

> *Note:* QoS statistics are only collected on a point-to-point basis between these gateways in a network. The QoS statistics are not collected from all networks that the call passes through. For significant enterprise networks, it is possible to install call//fax/modem transponders to ensure that the enterprise network has adequate internal QoS.

Not all QoS statistics are provided by all media gateways. For example, the UAS does not support the jitter and latency statistics. Therefore, if the binary QoS records, from the UAS, do not contain valid values for any of the QoS statistics, then the values (for example, jitter, or latency) are not included in the output IPDR record.

Real-time streaming of the IPDR stream to the OSS is provided by means of the stream QoS utility. Also, a software tool (displayQoS) is provided with the QoS Collector application to display IPDRs in an

output QoS Collector Application file. You can choose from three options for outputting IPDR data to this file:

- display all the IPDRs in the file

- display all the IPDRs for a particular subscriber ID

- display all the IPDRs for a particular media gateway controller

When the QoS reporting software is started on a client (CS 2000 GWC) the software connects to the QoS Collector Application IP address and port based on configuration details established by the CS 2000 GWC Manager. Once the connection is established, the QoS Collector Application waits to receive data from the client CS 2000 GWC. To ensure the connection is not automatically closed after two hours (if there is no data received) the client sends a "heart beat" message after two hours of inactivity.

For more information on the QoS Collector Application in North American solutions, see *IP Solutions Basics*, NN10300-100 and *ATM/IP Solution-level Configuration Management*, NN10409-500.

For more information on the QoS Collector Application in international solutions, refer to *Packet Transit - IP Solution-level Basics,* NN10050-100 and *ATM/IP Solution-level Configuration Management*, NN10409-500.

Log reports

A log report is a message about an important event in the communication server or network component. Log reports include the following information:

- state and activity reports

- changes in state

- reports on hardware or software errors

- test results

- other events or conditions that affect performance

Examples of logs or OMs that can be useful for the following activities are listed below:

- Call processing activity - ACT100

- Trunk group activity - E911, KTRK100

- System activity - PM188, QMSACT, syslog

- Link activity and occupancy - many logs report on link activity and occupancy.

  For example KTRK100 collects information on trunks in the following categories:

  — Killer trunk - a trunk that the system seizes repeatedly and then drops. This can be due to the subscriber dropping the line due to a perceived fault.

  — Slow trunk release - a trunk with a low attempt rate and high use. This can be due to the test equipment.

  — Always busy trunk - a trunk that was busy throughout the report period. This can be due to under-engineering, normal high use, or equipment problems.

  — Always idle trunk - a trunk with zero attempts. This can be due to over-engineering, incorrect network management, or malfunctioning equipment.

Viewing sun-mib SNMP attribute definitions on an SSPFS-based server

Application

Use this procedure to view the SNMPattribute definitions in the sun-mib file on a Succession Server Platform Foundation Software (SSPFS)-based server.

Prerequisites

You need root user privileges.

Action

Perform the following steps to complete this procedure.

At your workstation

1 Telnet to the server by typing

> `> telnet <IP address>`

and pressing the Enter key.

where

IP address
  is the IP address of the SSPFS-based 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 user ID and password.

5 Access the directory where the sun-mib file resides by tying

> `# cd /opt/nortel/snmp-poller/config/profiles/SSPFS/mibs`

and pressing the Enter key.

6 Display the contents of the sun-mib file by typing

> `$ more sun-mib`

and pressing the Enter key.

7   Search for a particular attribute by typing

`/ <attribute>`

and pressing the Enter key.

> **attribute**
>   is the attribute you want to search for

Note: The search is case sensitive.

> **Example**
> `/ ipForwarding`

Example response

```
ipForwarding OBJECT-TYPE
 SYNTAX INTEGER
    forwarding (1), --acting as a gateway
    not-forwarding (2) -- NOT acting as a gateway

ACCESS read-write
STATUS mandatory
DESCRIPTION
  "The indication of whether this entity is
acting as an IP gateway in respect to the
forwarding of datagrams received by, but not
addressed to, this entity. IP gateways forward
datagrams. IP hosts do not (except those
source-routed via the host).
...
```

8   Repeat step [7] for each SNMP attribute you want to search for.

9   Exit the file display by typing

`--More-- ` **`q`**

and pressing the Enter key.

10   You have completed this procedure.

Task flows

The table ATM and IP solutions performance management documents lists the various components as well as the documents where you can find specific performance management information (including task flows).

ATM and IP solutions performance management documents

Component	Document
CS 2000	*Communication Server 2000 Performance Management*, NN10149-711
CS 2000-Compact	*Call Agent Performance Management*, NN10153-711
CS 2000 Core Manager	*CS 2000 Core Manager Performance Management*, NN10148-711
Succession GWC	*Gateway Controller Performance Management*, NN10208-711
USP	*USP Performance Management*, NN10137-711
USP-Compact	*USPc (compact) Performance Management*, NN10138-711
IW SPM-ATM	*IW SPM-ATM Performance Management*, NN10143-711 *DPT SPM ATM Performance Management*, NN10146-711
IW SPM-IP	*IW SPM-IP Performance Management*, NN10144-711
MG 4000	*MG 4000 Performance Management*, NN10142-711
MG 9000	*MG 9000 Performance Management*, NN10140-711
UAS	*Universal Audio Server Performance Management,* NN10139-711

ATM and IP solutions performance management documents

Component	Document
CS 2000 Management Tools (North American solutions)	*ATM Solutions Basics*, NN10320-100 *IP Solutions Basics*, NN10300-100
CS 2000 Management Tools (international solutions)	*Packet Transit - AAL2 Solution-level Basics*, NN10049-100 *Packet Transit - IP Solution-level Basics*, NN10050-100
Multiservice Switch 7480/15000	*Nortel Networks Multiservice Switch 7400/15000/20000 Data Management*, NN10600-561
Passport 8600	*Managing the Passport 8000 Series Switch Using Device Manager*, 313195A *Managing the Passport 8000 Series Switch Using the Command Line Interface Release 3.2*, 313194A *Networking Concepts for the Passport 8000 Series Switch*, 313196A
Multiservice Switch 15000/Media Gateway 15000	*Nortel Networks Multiservice Switch 15000, Media Gateway 15000 and Preside MDM in Succession Networks Performance PT-AAL1/UA-AAL1/UA-IP*, NN10158-711
Multiservice Switch 15000	*Preside MDM Management Data Provider User Guide*, 241-6001-309
CICM	*CICM Performance Management*, NN10248-711
Session Server	*Session Server Performance Management*, NN10342-711
Integrated EMS	*Integrated EMS Performance Management*, NN10327-711

Task flows for PT-SN70 and PT-XA Core

For information on performance measurements for DMS and SPM related equipment on the PT-XA Core, or PT-SN70 architectures, see *Communication Server 2000 Performance Management,*

NN10149-711, and *DPT SPM ATM Performance Management,* NN10146-711.