Carrier VoIP

Gateway Controller Performance Management

NN10208-711

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Gateway Controller Performance Management

New in this release

The following sections detail what's new in *Gateway Controller Performance Management* (NN10208-711) for (I)SN09U.

Features

Release (I)SN09U contains no feature updates.

Other changes

See the following sections for information about changes that are not feature-related:

References to the Core

Throughout this NTP, all generic references to the Core apply to both implementations of Core functionality:

- XA-Core, in a CS 2000 configuration environment
- Compact Call Agent (CCA), in a CS 2000 - Compact configuration environment

Information related to NORTEL-PERF-REF-MIB

Information related to NORTEL-PERF-REF-MIB added in section "NORTEL-PERF-REF-MIB" (page 21).

APG-related OMs

Removed all references to operational measurements (OM) associated with the Anchor Packet Gateway (APG) product - obsolete in (I)SN07

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Performance management strategy

CS 2000 captures performance metrics through operational measurement (OM) registers. The OMs collect operational statistics that are successfully reported to the Core and stored in the Core for future retrieval. Performance is measured and reported by event peg counts and state usage counts.

Some OMs originate from the gateways and are reported to the GWC, which then forwards the OMs to the CS 2000. To retrieve these OM statistics about gateways, see *Communication Server 2000 Performance Management* (NN10149-711). Examples would be the DTSR or CES OMs generated by the MG 9000 gateway. For more information about these OMs see *MG 9000 Performance Management* (NN10140-711).

In addition to OMs, the GWC also uses Management Information Base (MIB) performance measurements (PM) to collect statistics. Go to section "Performance measurements" (page 16) for the description of each GWC MIB.

Data collection methods

Performance data from devices, including the GWC, is collected using one of the following applications:

- Integrated Element Management System (IEMS)
  From (I)SN08 onwards, this is the recommended method.
- SNMP PM Poller
  This application is available, but is no longer supported.

IEMS

Performance data collected from devices is monitored and displayed in the Configured Collection node of IEMS. The screen lists the agents of the various devices from which the Object Identifiers (OID) are collected. The OIDs are collected by the Data Collection Job of the IEMS Performance Management module.

The OIDs to be collected for any given device are defined by SNMP templates; these templates are XML files. Users can set up different collection templates for different devices. OID reports can be generated using the Report Job options. Collected data or reports can be transferred to the OSS.

For information about how to create and use SNMP templates with data collection jobs, see *IEMS Performance Management* (NN10327-711).

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Many FCAPS activities can now be performed using IEMS, including access to the CS 2000 GWC Manager and the CS 2000 SAM21 Manager. To launch the CS 2000 GWC Manager or the CS 2000 SAM21 Manager, see the following procedures in *IEMS Overview* (NN10329-111):

- "Launch GWC Manager"
- "Launch SAM21 Manager"

SNMP PM Poller

Some PMs in each of the MIB database files are polled by the (simple network management protocol (SNMP) PM Poller, a utility found on the CS 2000 Management Tools server. PM Poller collects performance attributes from several Carrier Voice over IP (VoIP) network components. Some PMs in the GWC-UNIT-STATUS-MIB are also displayed on the CS 2000 GWC Manager.

Tools and utilities

OMs are accessed using the Core MAP display commands such as OMSHOW.

PMs can be viewed using the following:

- IEMS data collection job (the recommended method)
- CS 2000 GWC Manager GUI
- SNMP PM Poller data collection output files

For each option, a subset of all PMs listed in the GWC MIB files is available. For more information, see section "Performance measurements" (page 16).

The comma separated value (CSV) PM Poller output files can be loaded into a customer supplied text viewer or into spreadsheet software to browse or manipulate the raw data.

The CSV file format is not intended to be a user-friendly format for viewing the output using a standard text editor.

Nortel recommends that you use an OSS tool to view the CSV output files. If you require a product to analyze and view performance data, contact your Nortel account prime to allow Nortel staff to review and recommend a commercial solution.

Prior to data collection, you must to configure access to the GWC and Shelf Controller MIB data using the CS 2000 SAM21 Manager.

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Operational measurements

The following OMs impact GWC performance management:

- XPMOVLD
- XPMOCC
- DTSRPM

XPMOVLD OM

The XPMOVLD OM has traditionally been used to collect statistics on DMS-system based XPM overload conditions. In Carrier VoIP networks, this OM collects statistics on the number of delayed originations, number of delayed terminations, and the number of lost originations or terminations due to different reasons. This OM is used as part of the System Overload Controls feature, a set of software functionality that are distributed throughout the Core architecture and used to mitigate resource consumption during periods of peak usage that would exceed normal engineered office limits.

The XPMOVLD OM is an unsolicited OM. Once it is turned on by the Core, statistics are continually collected and reported by the GWC. No further messaging is required by the Core until the OM is turned off. The XPMOVLD OM is off by default.

The status of the OM can be checked at any time in table OFCVAR. Once in TABLE OFCVAR, position on XPMOVLD_OM_CONTROL. This parameter is used for Legacy OM control. If this variable is set to Y, then the OM is on, if it is set to N, then the OM is off. Simply change the variable to toggle the OM off and on. For simplex GWCs (GWC cards not configured to operate with a duplex backup unit) it is necessary to busy and return to service the GWC card for the OM to start. For information about how to busy and return to service individual GWC cards, see *Gateway Controller Security and Administration* (NN10213-611). The following flow chart shows the XPMOVLD OM register flow.

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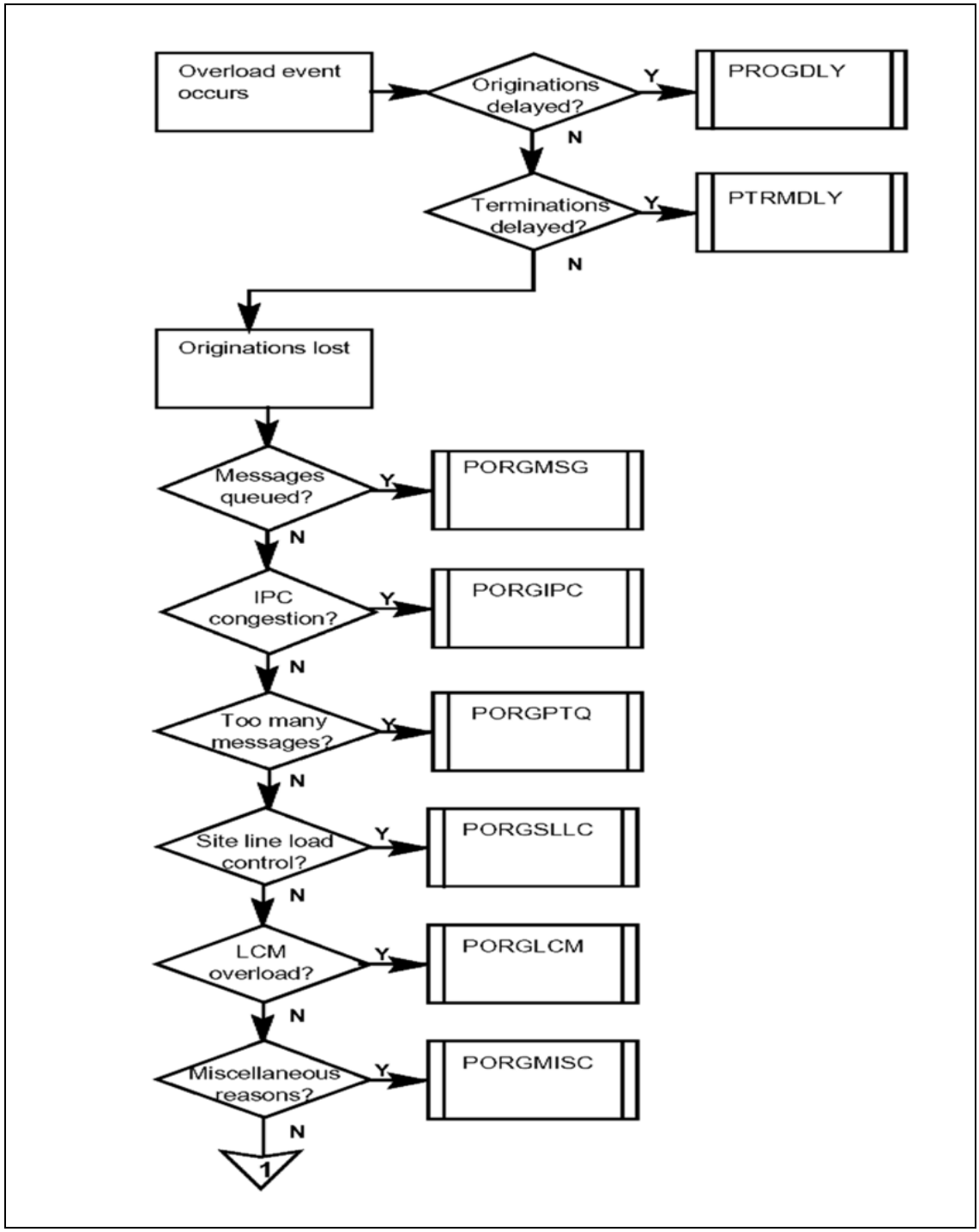
OM Group XPMOVLD Registers Flow



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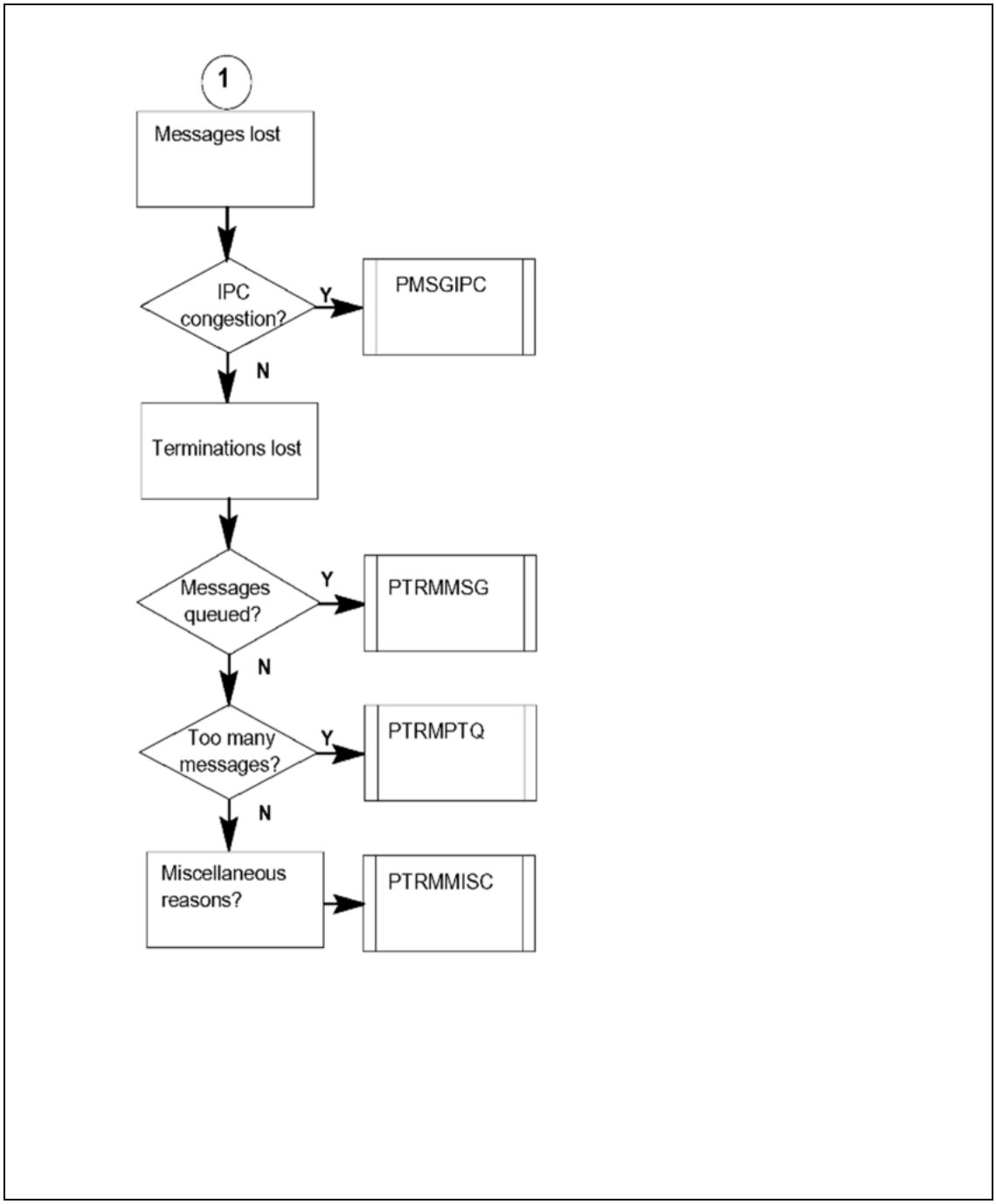

XPMOVLD OM registers

OM name	OM register	Purpose
XPMOVLD		collects statistics on DMS-system based XPM overload conditions

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OM name	OM register	Purpose
	PROGDLY	counts the number of originations delayed.
	PTRMDLY	counts the number of terminations delayed.
	PORGMSG	counts the number of originations lost because too many messages are present in the flow control system.
	PORGIPC	stands for PM originations interprocess communication (IPC) buffer congestion. Counts the number of originations lost as a result of IPC buffer congestion.
	PORGPTQ	counts the number of originations lost because of the limit on the number of messages allowed per terminal in the flow control system.
	PORGSLLC	counts the number of originations lost as a result of site line load control.
	PORGLCM	counts the number of originations lost as a result of line concentrating module overload.
	PORGMISC	counts the number of originations lost for miscellaneous reasons. An IPC buffer index that is not correct is an example of a miscellaneous reason.
	PMSGIPC	stands for PM messages IPC buffer congestion (PMSGIPC). Counts the number of messages lost as a result of IPC buffer congestion. The messages that this register counts include messages other than originations.
	PTRMMSG	counts the number of terminations lost because there are too many messages in the flow control system.
	PTRMPTQ	counts the number of terminations lost because of the limit on the number of messages allowed per terminal in the flow control system.
	PTRMMISC	counts the number of terminations for miscellaneous reasons. An IPC buffer index that is not correct is an example of a miscellaneous reason.

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XPMOCC OM

The XPMOCC OM is used to collect statistics on CPU occupancy in the GWC. Statistics are collected in the GWC in the same manner as they were in the XPM. Statistics collected correlate with the amount of time the GWC is at a specific occupancy level. Like XPMOVLD the OM is used as part of the System Overload Controls feature.

The XPMOCC OM is an unsolicited OM. Once it is turned on by the Core, statistics are continually collected and reported by the GWC. No further messaging is required by the Core until the OM is turned off.

The XPMOCC OM is off by default. The status of the OM can be checked at any time in TABLE OFCVAR. Once in TABLE OFCVAR, position on XPMOCC_OM_CONTROL. This parameter is an existing parameter used for Legacy OM control. If this variable is set to Y, then the OM is on, if it is set to N, then the OM is off. Simply change the variable to toggle the OM off and on. For simplex GWCs (GWC cards not configured to operate with a duplex backup unit) it is necessary to busy and return to service the GWC card for the OM to start. For information about how to busy and return to service individual GWC cards, see *Gateway Controller Security and Administration* (NN10213-611). The following flow chart shows the XPMOVLD OM register flow.

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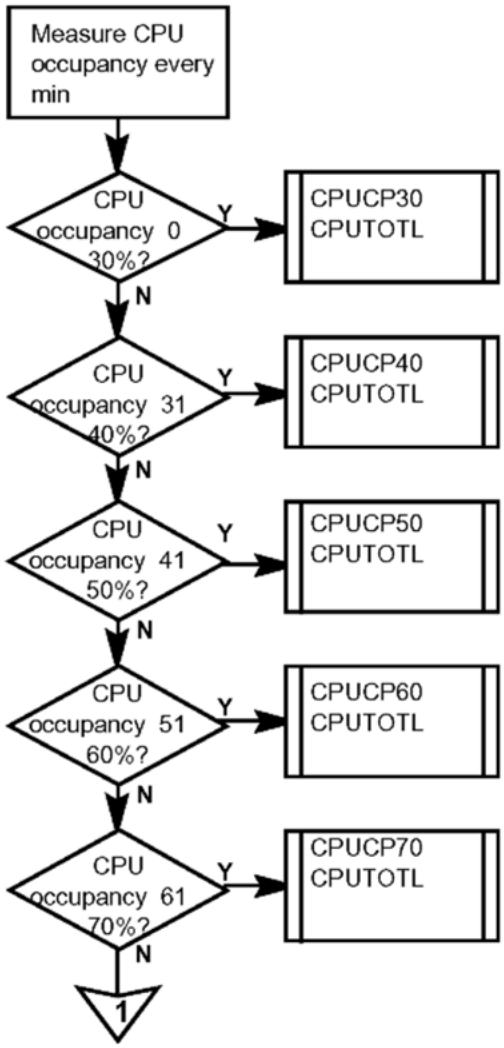
OM Group XPMOCC Registers Flow



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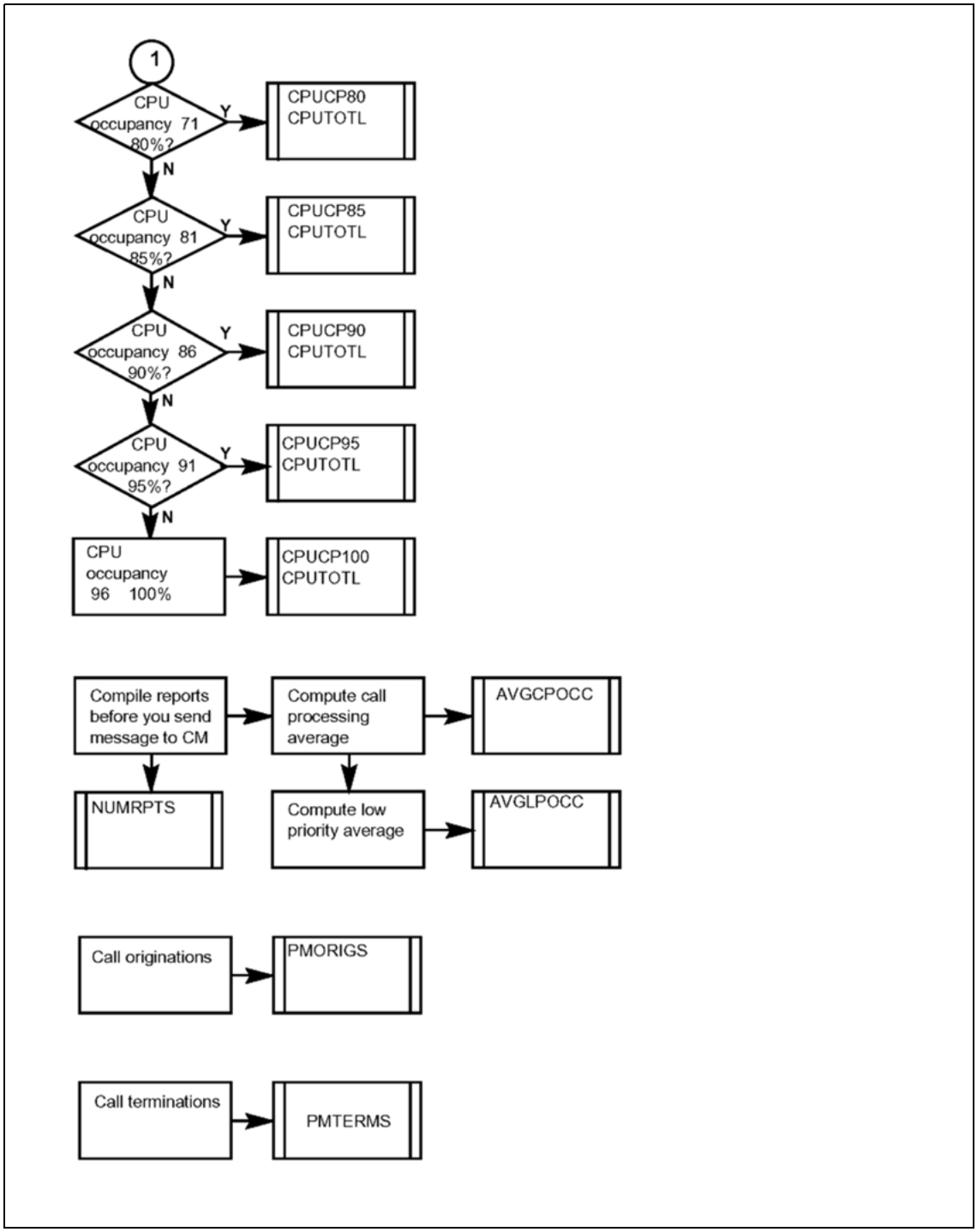

XPMOCC OM registers

OM name	OM register	Purpose
XPMOCC		collects statistics on CPU occupancy in the GWC

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OM name	OM register	Purpose
	AVGCPOCC	a usage register that measures average call processing occupancy
	AVGLPOCC	a usage register for unified processors. It measures average low priority occupancy. Enhanced ISDN signaling processors (EISN) have a zero in this register.
	CPUCP100	counts the number of times call processing occupancy is in the 96 to 100% range
	CPUCP30	counts the number of times call processing occupancy is in the 0 to 30% range
	CPUCP40	counts the number of times call processing occupancy is in the 31 to 40% range
	CPUCP50	counts the number of times call processing occupancy is in the 41 to 50% range
	CPUCP60	counts the number of times call processing occupancy is in the 51 to 60% range
	CPUCP70	counts the number of times call processing occupancy is in the 61 to 70% range
	CPUCP80	counts the number of times call processing occupancy is in the 71 to 80% range
	CPUCP85	counts the number of times call processing occupancy is in the 81 to 85% range
	CPUCP90	counts the number of times call processing occupancy is in the 86 to 90% range
	CPUCP95	counts the number of times call processing occupancy is in the 91 to 96% range
	CPUTOTL	accumulates the totals in registers CPUCP30, CPUCP40, CPUCP50, CPUCP60, CPUCP70, CPUCP80, CPUCP85, CPUCP90, CPUCP95, and CPUCP100.
	NUMRPTS	counts the number of 15 min. reports added to accumulation registers to normalize registers AVGCPOCC and AVGLPOCC.
	PMORIGS	counts the total call origination attempts. Register PMORIGS reports on an XPM by XPM basis. This register contains a value only for tuples that associate with the unified processor. Register PMTERMS always contains a zero for enhanced ISDN signaling processor (EISP) tuples.
	PMTERMS	counts total call termination attempts. Register PMORIGS reports on an XPM by XPM basis. This register contains a value only for tuples that associate with the unified processor. Register PMTERMS always contains a zero for EISP tuples.

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DTSRPM

The DTSRPM registers collect performance statistics related to off-hook activity emanating over a line gateway then reports them to the Core. Because not all gateways support dial tone speed recording (DTSR), all DTSR-related statistic collection is done by the GWC itself.

The GWC takes a time stamp when an off hook signal is received. It then takes a second timestamp when the acknowledgement for the apply dial tone message is received. It compares the two timestamps and reports dial tone delay based on the difference. The time delay represents how long it takes for an off hook to travel to the core, be processed, and the resulting dial tone to come back to the line.

All the statistics are stored in the applicable registers shown in the following table and reported to the Core. The GWC keeps track of the statistics by internal node number.

DTSRPM OM registers

OM name	OM register	Purpose
Dial tone speed recording peripheral module (DTSRPM)	DTMF originations	Pegged when a DTMF line goes off hook
	DTMF delays	Pegged when dial tone is applied more than 3 seconds after the off hook
	DP originations	Not supported
	DP delays	Not supported
	Keyset originations	Pegged when a P-phone line goes off hook
	Keyset delays	Pegged when dial tone is applied more than 3 seconds after the off hook

Performance measurements

PMs are statistics about the system, collected using MIB-based peg counters. The GWC PMs are defined in the following files:

- "GWC-UNIT-STATUS-MIB" (page 17)
- "NORTEL-PERF-REF-MIB" (page 21)
- "MIB II (RFC1213-MIB and Host-Resources-MIB)" (page 25)

Tables in the following sections describe the MIB attributes for all GWC MIB objects in these files. To determine whether a MIB object is polled using the default configuration, see field “Polled by default”.

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SNMP PM Poller CSV output files are located in the /data/oms directory on the CS 2000 Management Tools server.

There are a number of GWC MIB objects that are used but not polled using the SNMP PM Poller's default configuration. For procedures to add, configure or delete the PM Poller, see the CS 2000 Management Tools information in *Nortel ATM/IP Solution-level Configuration* (NN10409-500).

GWC-UNIT-STATUS-MIB

This MIB is located in the following directory on the SPFS-based server that is hosting the CS 2000 Management Tools: /opt/nortel/snmp-poller/config/profiles/GWC/mibs.

Most objects in the GWC-UNIT-STATUS-MIB are displayed as PM parameters on certain screen elements in the CS 2000 GWC Manager GUI (see the fields, "EM Screen Name" and "EM PM Name" in the following table)

The following table contains the objects and attributes of the GWC-UNIT-STATUS-MIB.

GWC-UNIT-STATUS-MIB objects

MIB Objects	Attributes
norUnitAdminStatus	Object type: Scalar
	Syntax: NorNodeIsoAdminState
	OID: gwcUnitStatus 1
	EM Screen Name: Maintenance panel
	EM PM Name: Administrative state
	Description: The desired state of the Card (Manager set)...ISO AdminState.
	Polled by default: Yes
norUnitOperStatus	Object type: Scalar
	Syntax: NorNodeIsoOperState
	OID: gwcUnitStatus 2
	EM Screen Name: Maintenance panel
	EM PM Name: Operational state
	Description: The operational state of the Card...ISO OperState
	Polled by default: Yes

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MIB Objects	Attributes
norUnitUsageStatus	Object type: Scalar
	Syntax: NorNodeIsoUsageState
	OID: gwcUnitStatus 3
	EM Screen Name: Maintenance panel
	EM PM Name: Usage state
	Description: The usage state of the Card...ISO UsageState.
	Polled by default: No
norUnitAlarmStatus	Object type: Scalar
	Syntax: NorNodeIsoAlarmStatus
	OID: gwcUnitStatus 4
	EM Screen Name: Maintenance panel
	EM PM Name: Alarm state
	Description: The alarmStatus of the Card...ISO AlarmStatus.
	Polled by default: No
norUnitAvailStatus	Object type: Scalar
	Syntax: NorNodeIsoAvailStatus
	OID: gwcUnitStatus 5
	EM Screen Name: Maintenance panel
	EM PM Name: Available state
	Description: The availabilityStatus of the Card...ISO AvailabilityStatus
	Polled by default: No
norUnitStandbyStatus	Object type: Scalar
	Syntax: NorNodeIsoStandbyStatus
	OID: gwcUnitStatus 6
	EM Screen Name: Maintenance panel
	EM PM Name: Stand by state
	Description: The standbyStatus of the Card...ISO StandbyStatus
	Polled by default: No

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MIB Objects	Attributes
norUnitUnknownStatus	Object type: Scalar
	Syntax: NorNodeIsoUnknownStatus
	OID: gwcUnitStatus 7
	EM Screen Name: Not applicable
	EM PM Name: Not applicable
	Description: The unknownStatus of the Card...ISO UnknownStatus
	Polled by default: No
norUnitFaultStatus	Object type: Scalar
	Syntax: NorNodeFaultStatus
	OID: gwcUnitStatus 8
	EM Screen Name: Maintenance panel
	EM PM Name: Fault state
	Description: The Current FaultStatus of the Card. A bitMap, with each bit representing the possible faults on a card.
	Polled by default: No
norUnitActivity	Object type: Scalar
	Syntax: NorNodeActivity
	OID: gwcUnitStatus 9
	EM Screen Name: Maintenance panel
	EM PM Name: Activity state
	Description: The Activity of the Card. This is read-only; to force a SwAct the Manager should use the norUnitSwActStatus object.
	Polled by default: Yes
norUnitIsolation	Object type: Scalar
	Syntax: NorNodeIsolation
	OID: gwcUnitStatus 10
	EM Screen Name: Maintenance panel
	EM PM Name: Isolation state
	Description: The Isolation Status of the Card.
	Polled by default: No

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MIB Objects	Attributes
norUnitAdminStatusOverride	Object type: Scalar
	Syntax: NorNodeAdminStatusOverride
	OID: gwcUnitStatus 11
	EM Screen Name: Not applicable
	EM PM Name: Not applicable
	Description: By setting this field in addition to setting the adminStatus of the Unit, the Manager can override restrictions on the set.
	Polled by default: No
norUnitSwActStatus	Object type: Scalar
	Syntax: NorNodeSwActStatus
	OID: gwcUnitStatus 12
	EM Screen Name: Maintenance panel
	EM PM Name: Swact state
	Description: The type of SwAct to execute. Setting this field acts as a trigger to the Agent to initiate a SwAct on the Unit. In the event of a device SwAct (nonDirected), the manager can read this field to find out why.
	Polled by default: No
norUnitReset	Object type: Scalar
	Syntax: NorNodeReset
	OID: gwcUnitStatus 13
	EM Screen Name: Not applicable
	EM PM Name: Not applicable
	Description: This is a command to perform a processor reset of the Unit. This may not be reliable if any of the software running on the Unit is not sane.
	Polled by default: No

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MIB Objects	Attributes
operStatusLastChange	Object type: Scalar
	Syntax: TimeStamp
	OID: gwcUnitStatusChanges 2
	EM Screen Name: Not applicable
	EM PM Name: Not applicable
	Description: The last change time of the norUnitOperStatus.
	Polled by default: No
activityLastChange	Object type: Scalar
	Syntax: TimeStamp
	OID: gwcUnitStatusChanges 9
	EM Screen Name: Not applicable
	EM PM Name: Not applicable
	Description: The last change time of the norUnitActivity.
	Polled by default: No

NORTEL-PERF-REF-MIB

The NORTEL-PERF-REF-MIB is located in the following directory on the SPFS-based server that is hosting the IEMS, which can be either on a standalone SPFS-based server or on the same SPFS-based server as the CS 2000 Management Tools:
/opt/nortel/iems/current/mibs/cicm/NORTEL-PERF-REF.mib.v9.txt

The following performance statistics are reported through the NORTEL-PERF-REF-MIB:

- "Media proxy OMs" (page 21)
- "External interface PMs" (page 24)

Media proxy OMs

The media proxy OMs are collected by IEMS polling (see IEMS) and reported using the GWC generic performance reference MIB. Only the active GWCs report the OMs; inactive GWCs are ignored.

The media proxy OMs are not polled by default. To switch the OMs on, the user must include the following commands in the SNMP template for the IEMS data collection job.

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The XML commands in the SNMP template provide a default list of the GWC OIDs collected by IEMS. The list is configurable at run time to add or delete metrics from the template. Users can set up different collection templates for different GWCs.

SNMP template

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<!DOCTYPE CONFIG_SCHEMA SYSTEM "commontemplate.dtd">
<CONFIG_SCHEMA VERSION="8.0"  READ-ONLY="true" >
<TABLE
name=".iso.org.dod.internet.private.enterprises.nortel.nortelGenericMIBs.n
ortelPerfRefMIB.nnPerfMetricReferenceTable.nn
PerfMetricReferenceEntry" MIB="NORTEL-PERF-REF-MIB" FILE="/mibs/cicm/
NORTEL-PERF-REF.mib.v9.txt">
<COLUMN>nnPerfMetricGroup</COLUMN>
<COLUMN>nnPerfMetricName</COLUMN>
<COLUMN>nnPerfMetricDataType</COLUMN>
<COLUMN>nnPerfMetricValue</COLUMN>
<COLUMN>nnPerfMetricRefIndex</COLUMN>
<COLUMN>nnPerfMetricSources</COLUMN>
</TABLE>
</CONFIG_SCHEMA>
```

If a call fails to set up on a media proxy attempted by the GWC, it may still succeed on another media proxy. In this case, a failure is still logged against the failing media proxy, but the call itself is counted as successful for the GWC. If there are no media proxies in service when one is required, a fail is counted against the whole GWC, but not against any individual media proxy. For these two reasons, the total number of failed calls for the GWC is not always equal to the sum of the failed calls on all its media proxies.

If a media proxy is de-provisioned, its OMs for the current 5-minute and 30-minute periods are lost.

The following table lists the attributes of the 5-minute and 30-minute OMs for calls involving media proxies. The 5-minute polling periods align with the hour (that is, they start at hh:00:00, hh:05:00 and so on).

Media proxy 5-minute and 30-minute OMs

Name	Description	Behavior
Number of provisioned media proxies	The number of currently provisioned media proxies on the GWC.	This OM counts the number of media proxies currently provisioned on the GWC in each 5-minute period. This OM complements the "media proxies in disabled state" alarm (alarm ID GWC315).

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Name	Description	Behavior
Media proxy 5-minute successful calls	The number of calls that were successfully set up using this media proxy on this GWC in the last 5-minute OM period.	Each time a successful call is set up involving a given media proxy, the count for that media proxy is incremented. At every 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.
Media proxy 30-minute successful calls	The number of calls that were successfully set up using this media proxy on this GWC in the last 30-minute period.	Each time a successful call is set up involving a given media proxy, the count for that media proxy is incremented. At every sixth 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.
Media proxy 5-minute failed calls	The number of failed attempts to set up a call using this media proxy on this GWC in the last 5-minute OM period.	Each time an attempt to set up a call on a given media proxy fails, the count for that media proxy is incremented. At every 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.
Media proxy 30-minute failed calls	The number of failed attempts to set up a call using this media proxy on this GWC in the last 30-minute period.	Each time an attempt to set up a call on a given media proxy fails, the count for that media proxy is incremented. At every sixth 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.
GWC 5-minute successful calls	The number of calls that were successfully set up using any available media proxy on this GWC in the last 5-minute OM period.	Each time a successful call is set up involving any media proxy, the count for the whole GWC incremented. At every 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.
GWC 30-minute successful calls	The number of calls that were successfully set up using any available media proxy on this GWC in the last 30-minute period.	Each time a successful call is set up involving any media proxy, the count for the whole GWC incremented. At every sixth 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.

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Name	Description	Behavior
GWC 5-minute failed calls	The number of failed attempts to set up a call on any available media proxy on this GWC in the last 5-minute OM period.	Each time an attempt to set up a call involving any media proxy fails, the count for the whole GWC is incremented. A failure is deemed to be a call where a media proxy is required and media proxy resources are requested, but where the call subsequently ends (for any reason) before media proxy resources are successfully allocated. At every 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.
GWC 30-minute failed calls	The number of failed attempts to set up a call on any available media proxy on this GWC in the last 30-minute period.	Each time an attempt to set up a call involving any media proxy fails, the count for the whole GWC is incremented. A failure is deemed to be a call where a media proxy is required and media proxy resources are requested, but where the call subsequently ends (for any reason) before media proxy resources are successfully allocated. At every sixth 5-minute polling period, the count is reported and then reset to 0 to begin counting for the next period.

External interface PMs

The following table lists the attributes of the PMs associated with the alarm (alarm ID GWC315) raised for lost communication with media proxies and external hosts (gateways, peer GWCs, USP).

External interface PMs

PM name	Group	Source	Type
Media proxies in disabled state	communication	multi (1)	COUNTER_32 (1)
Small GWs in disabled state	communication	multi (1)	COUNTER_32 (1)
Large GWs in disabled state	communication	multi (1)	COUNTER_32 (1)
Trunk GWs in disabled state	communication	multi (1)	COUNTER_32 (1)
Audio GWs in disabled state	communication	multi (1)	COUNTER_32 (1)
Total GWs provisioned	measurement	multi (1)	COUNTER_32 (1)
DNS failed GW discovery	quality of service	multi (1)	COUNTER_32 (1)
DNS good GW discovery	measurement	multi (1)	COUNTER_32 (1)
RSIP used in GW discovery	quality of service	multi (1)	COUNTER_32 (1)
Total DNS GWs to discover	measurement	multi (1)	COUNTER_32 (1)
USP SS7 paths disabled	communication	multi (1)	COUNTER_32 (1)
USP SS7 path not active	communication	multi (1)	COUNTER_32 (1)
Peer connections failed during interval	communication	multi (1)	COUNTER_32 (1)

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PM name	Group	Source	Type
Peer connections completed during interval	communication	multi (1)	COUNTER_32 (1)
Peer connections attempted during interval	measurement	multi (1)	COUNTER_32 (1)

The External interface PMs are collected by the IEMS polling (see "IEMS" (page 6)) and reported using the GWC generic performance reference MIB (NORTEL-PERF-REF.mib.v9.txt). The PMs are not polled by default. At the IEMS GUI, the user must create a data collection template, add a data collection job, and add a report job. For more information about these tasks, see *IEMS Performance Management* (NN10327-711).

In addition, the user must configure the IP address of the IEMS through the CS 2000 SAM21 Manager GUI so that the IEMS can access gateway controller (GWC) and SAM21 Shelf Controller MIB information (see "Configure access to GWC and Shelf Controller MIB data" (page 35))

The PM reports will be different for each type of GWC as not all PMs are valid for a given GWC. For example, if a GWC is strictly a trunks GWC, then none of the PMs involving DNSs are included. The PM reports for an individual GWC only include the PMs that are valid for that GWC.

MIB II (RFC1213-MIB and Host-Resources-MIB)

The second version of the Management Information Base (MIB-II) is supported by the GWC and other Carrier VoIP devices. This MIB is typically used with network management protocols in TCP/IP-based networks. The MIB-II profile includes

- Host-Resources-MIB
- RFC1213-MIB

MIB-II objects are located in the following directory on the CS 2000 Management Tools server: /opt/nortel/ptm/current/mibs.

More information on MIB-II is available on the Internet Engineering Task Force (IETF) web site at http://www.ietf.org/.

GWC performance management procedures

The following procedures for managing GWC performance are included in this NTP:

- "View GWC performance data" (page 26)
- "View and interpret the operational status of a GWC node" (page 30)
- "Configure access to GWC and Shelf Controller MIB data" (page 35)

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View GWC performance data

Purpose of this procedure

Use this procedure to display performance related information about the GWC operation and capacities.

When to use this procedure

Use this procedure as a primary source for accessing performance related information.

Prerequisites

This procedure has no prerequisites.

Action

Gateway Controller OM data, including active and holding counts, can be viewed using the Core MAP OMSHOW command. Counts remain in active registers until the end of the holding period. At the end of the holding period, the counts are transferred to the holding registers. The following procedure illustrates the use of the OMSHOW command:

Step	Action

At the MAP level

1 View OM counts by typing

```
>OMSHOW <om_name> <class>
```

where

om_name is the name of the OM
class is the name of the class to appear (ACTIVE or HOLDING)

Example

```
 >OMSHOW XPMOVLD ACTIVE
XPMOVLD
CLASS:   ACTIVE
 START:2006/03/20 00:15:00 MON; STOP: 2006/03/20
00:00:00 MON;
 SLOWSAMPLES:      17; FASTSAMPLES:      165;
         INFO (XPMOVLD_OM_KEY)
           PORGDLY    PTRMDLY    PORGMSG    PTRMMSG
           PORGIPC    PMSGIPC    PORGPTQ    PTRMPTQ
           PORGSLLC    PORGLCM   PORGMISC   PTRMMISC
    0        GWC     0   N
                 0          0          0          0
                 0          0          0          0
                 0          0          0          0
```


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```
1      GWC    1    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
2            GWC         2    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
3            GWC         3    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
4            GWC         4    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
5            GWC         5    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
6            GWC         6    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
7            GWC         7    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
8            GWC         8    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
9            GWC         9    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
10           GWC        10    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
11           GWC        11    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
12           GWC        12    N
                0            0            0            0
                0            0            0            0
                0            0            0            0
13           GWC        13    N
                0            0            0            0
```


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	0		0	0	0
	0		0	0	0
14	GWC	14	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
15	GWC	15	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
16	GWC	16	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
17	GWC	17	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
18	GWC	18	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
19	GWC	19	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
20	GWC	20	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
21	GWC	22	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
22	GWC	23	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
23	GWC	24	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
24	GWC	25	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0
25	GWC	26	N		
	0		0	0	0
	0		0	0	0
	0		0	0	0

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```
26          GWC      27    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
27          GWC      28    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
28          GWC      29    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
29          GWC      30    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
  30          GWC      31    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
31          GWC      32    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
32          GWC      33    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
33          GWC      34    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
34          GWC      35    N
                0           0           0           0
                0           0           0           0
                0           0           0           0
      ----------------------------------------------
                0           0           0           0
                0           0           0           0
                0           0           0           0
```

2 The procedure is complete.

—End—

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View and interpret the operational status of a GWC node

Purpose of this procedure

Use this procedure to determine the operational status of a selected Gateway Controller (GWC) node using the CS 2000 GWC Manager.

When to use this procedure

Use this procedure as a primary source of information about the operational status of a GWC card or GWC node.

Prerequisites or guidelines

This procedure has no prerequisites or guidelines.

Action

Step	Action
	At the CS 2000 GWC Manager client
1	At the CS 2000 Management Tools window, click the Gateway Controller folder from the Device Types menu.
2	From the Contents of: Gateway Controller frame, select the GWC node that you wish to view.
3	Click the **Maintenance** tab. The GUI displays the Maintenance panel with two independent status views, one for each of the GWC cards in the node.

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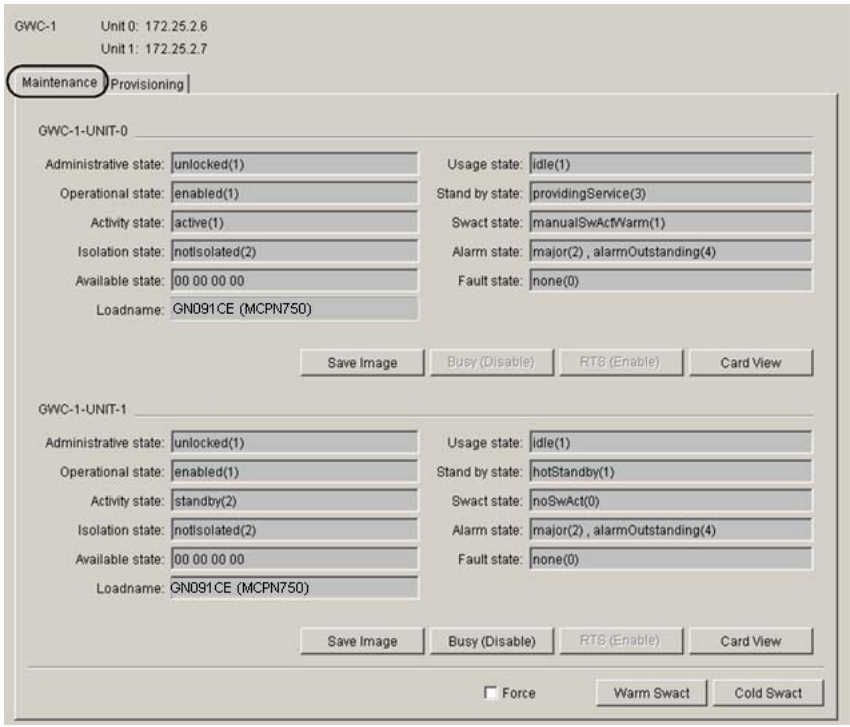

4 See table "CS 2000 GWC Manager status fields" (page 32) following this procedure to interpret the GWC card (unit) status fields.

If the selected GWC loses communication with the GWC Manager, the client does not provide an accurate status of the GWC node. You can verify the call processing status of a GWC node using the MAPCI interface. If required, follow procedure "Verify the call processing status of a GWC node" (page 31).

5 Repeat this procedure for other cards that you wish to view.

6 The procedure is complete.

—End—

Verify the call processing status of a GWC node

Step	Action
	At the MAPCI interface
1	Enter the peripheral module maintenance level by typing `>MAPCI;MTC;PM` and pressing the Enter key.

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2 Post the desired GWC node in the control position by typing

>post GWC <node_number>

and pressing the Enter key.

where

node_number is the node number of the GWC that you selected

3 The system displays both GWC units and their current states. Verify the current state of the selected GWC node.

The GWC node can be in one of the following states:

- InSv (in service)

  If one or both units are in an InSv state, the GWC is capable of performing call processing.

- SysB (system busy) or ManB (manual busy)

  If both units are in SysB or ManB state, the GWC is not capable of performing call processing.

4 Go back to step 5 in the main procedure.

—End—

The following table describes the GWC card (unit) status fields.

CS 2000 GWC Manager status fields

Status field	Possible values	Meaning
Administrative state:	locked	The unit is prohibited, administratively, from providing service to users.
	A status of "locked" on the CS 2000 GWC Manager indicates that the software application on the card is no longer performing its primary call processing function, but the card is still running. (The call processing function has been "busied", but underlying maintenance and communications activities are still functioning.) A status of "locked" on the CS 2000 SAM21 Manager indicates that the hardware is locked to ROM level, and the software application is no longer running.	
	unlocked	The unit is permitted, administratively, to provide service to users.
Operational state:	enabled	The unit is partially or fully providing service to users.

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Status field	Possible values	Meaning
	disabled	The unit is not operating or providing service to users. If the Administrative state for this unit is "locked", then the unit has been manually busied. If the Administrative state for this unit is "unlocked", then the unit has been busied by the system.
Activity state:	active	The unit is currently providing end user services. This is the state of the node as seen by other network elements.
	standby	The unit is not providing end user services but can be switched to Active at any time if the active (mate) unit fails.
Isolation state:	isolated	The unit is not communicating with the Core.
	notisolated	The unit is communicating with the Core.
Available state:	offLine(3)	The unit has not received its configuration data from the CS 2000 GWC Manager. The unit cannot provide service until it is booted and receives configuration data.
	degraded(6)	The unit does not have heartbeat communication with its mate and it is operating without fault-tolerant redundancy.
	offLine(3), degraded(6)	The unit has both: offline and degraded conditions.
	00 00 00 00	The unit does not have either of the preceding conditions.
Loadname:	<string_of_alphanumeric_ characters>	This is the name of the load file that the unit currently boots from. The file is located on the CS 2000 Core Manager or Core and Billing Manager (CBM) disk drive.
Usage state:	idle	The GWC maintenance system is not currently working on a request, such as a Return to Service (RTS). The unit is available for maintenance requests.
	busy	Maintenance is in progress on this unit and no further requests are accepted.
Stand by state:	providingService	The unit is the active unit and is providing service.
	hotStandby	The unit is the standby unit - ready to provide service.

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Status field	Possible values	Meaning
	coldStandby	The unit is synchronizing with the active unit (not providing redundancy). After completion of synchronization, the status changes to hotStandby when the Operational state is enabled.
Swact state:		This field indicates the last switch of activity for the unit.
	manualSwActWarm	Last switch of activity was due to a manual warm SwAct. Requested by a user, a warm SwAct causes no service interruption to stable calls, but calls in the setup processes can be lost.
	manualSwActCold	Last switch of activity was due to a manual cold SwAct. Requested by a user, a cold SwAct temporarily takes both units out of service and takes down all calls.
	autonomousSwActWarm	Last switch of activity was due to a system warm SwAct. These SwActs are automatically performed by the device in response to faults or failures. Established calls are preserved. Calls in setup are lost.
	autonomousSwActCold	Last switch of activity was due to a system cold SwAct. These SwActs are automatically performed by the device in response to faults or failures. All calls are lost.
	noSwAct	No switch of activity has occurred.
Alarm state:		This field indicates the severity of the currently raised alarms.
	00 00 00 00	There are no alarms raised on the GWC card unit.
	critical(1)	If present, indicates that one or more critical alarms have been raised.
	major(2)	If present, indicates that one or more major alarms have been raised.
	minor(3)	If present, indicates that one or more minor alarms have been raised.
	alarmOutstanding(4)	If present, indicates that at least one or a combination of different alarms has been raised.
Fault state:	none(0)	This field is not used.

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Configure access to GWC and Shelf Controller MIB data

Purpose of this procedure

Use this procedure to configure the IP address of a device or application that can access gateway controller (GWC) and SAM21 Shelf Controller MIB information.

This allows GWCs and SAM21 Shelf Controllers to be polled for MIB data by an Integrated Element Management System (IEMS) application (the preferred method) deployed on a host other than the CS 2000 Management Tools server.

This procedure does not interfere with the SNMP PM Poller application available at the CS 2000 Management Tools server. SNMP polling from the IEMS can be configured in addition to the PM Poller application residing on the CS 2000 Management Tools server.

The IEMS may reside on the CS 2000 Management Tools server. In this case, the IEMS uses the IP address of the SPFS server for element management communications.

You can also use this procedure to configure access to GWC and SAM21 Shelf Controller MIB data from an SNMP poller application that is not part of an IEMS.

Performance statistics for the SAM21 Shelf Controllers are available only if the SAM21 Shelf Controllers are configured with ATM interfaces.

When to use this procedure

Use this procedure if you are adding an IEMS to your network.

You can also use this procedure to configure access to GWC and SAM21 Shelf Controller MIB data from an SNMP poller application that is not part of an IEMS.

Prerequisites and guidelines

Performance data from the GWC is collected using one of the following applications:

- IEMS data collection jobFrom (I)SN08 onwards, this is the recommended method.
- SNMP PM Poller on the CS 2000 Management Tools serverThis application is available, but is no longer supported.

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If no server is configured, the GWCs and SAM21 Shelf Controllers continue to respond to SNMP requests from the PM Poller application deployed on the CS 2000 Management Tools.

Immediately after performing this procedure, a message is sent from the CS 2000 SAM21 Manager server application to the SAM21 Shelf Controllers to allow SNMP requests from the newly configured device or application. It is not necessary to reboot the GWC or SC cards.

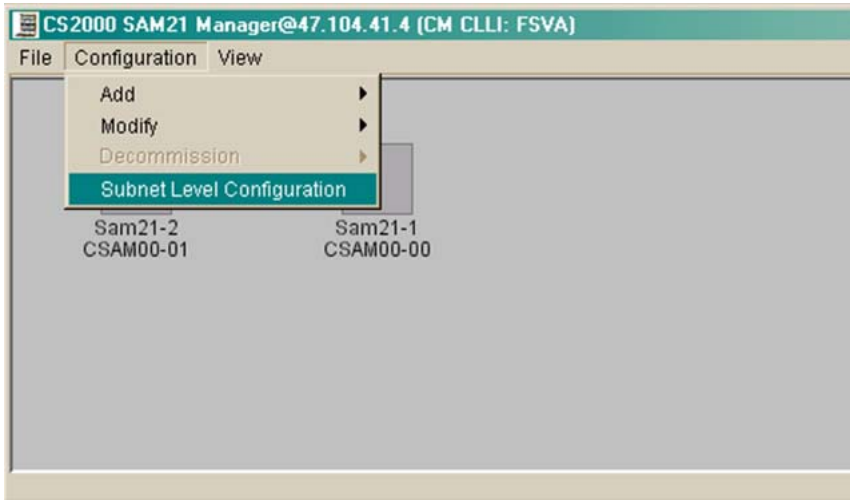
Action

Step	Action

At the CS 2000 SAM21 Manager client

1 At the CS 2000 SAM21 Manager Subnet View, click on the **Configuration** menu and select **Subnet Level Configuration**.

The Subnet Configuration window opens.



2 Determine your next step using the following table:

If	Do
you wish to configure a device or application to access MIB information (initial configuration)	step 3

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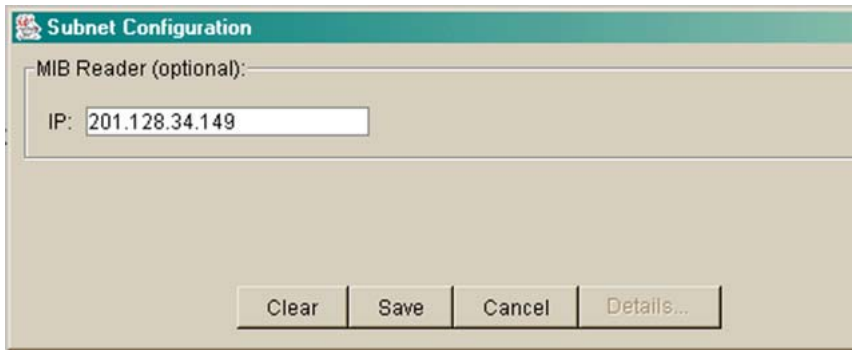
If	Do
you wish to remove the setting for a device or application that currently has access to MIB information	step 4
you wish to change the device or application that has access to MIB information	step 5

3 Perform the following steps to configure a device or application to access MIB data (initial configuration).

a. Enter a valid IP address for the device or application in the IP field.

Use the format <0-255>.<0-255>.<0-255>.<0-255>.

If the IP address is not valid, the IP field is outlined in red. Click the **Details** button for help on entering a valid address.



b. Click the **Save** button to implement the change.

GWCs and the SAM21 Shelf Controllers will now respond to SNMP request from the IP address identified in the previous step.

c. Go to step 6.

4 Perform the following steps to remove an existing subnet configuration setting from the system.

The current IP address setting appears in the IP field.

a. Click the **Clear** button to remove the entry in the IP field.

b. Click the **Save** button to implement the change.

The existing setting is removed. Any SNMP requests from the IP address previously configured are now rejected.

c. Go to step 6.

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5 Perform the following steps to change an existing subnet configuration setting.

The current IP address setting appears in the IP field.

a. Click the **Clear** button to remove the entry in the IP field.

b. At the Subnet Configuration window, enter a valid IP address for the IEMS in the IP field.

Use the format <0-255>.<0-255>.<0-255>.<0-255>.

If the IP address is not valid, the IP field is outlined in red. Click the **Details** button for help on entering a valid address.

c. Click the **Save** button to implement the change.

The setting is changed. MIB data for the GWC and SAM21 Shelf Controller is now available to the IP address configured in the previous step. Any SNMP requests from the IP address previously configured are now rejected.

6 This procedure is complete.

—End—

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Carrier VoIP

Gateway Controller Performance Management

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