CHAPTER 4

Managing the Cisco HSI

Introduction

This chapter provides information about operation and management tasks for the Cisco H.323 Signaling Interface (HSI) application. This chapter contains the following sections:

Restarting the Cisco HSI Application

To restart the Cisco HSI at the MML command prompt, use the **restart-softw** MML command. For more information about this command, see Appendix A, "MML User Interface and Command Reference."

To start the Cisco HSI application, see the "Installing the Cisco HSI" section on page 2-2.

Stopping Call Processing

To stop call processing, use the **stp-callproc** MML command. This command causes the handling of new call requests to cease immediately, and, if no timeout period is specified, all existing calls are released immediately. If a timeout period is specified, existing calls are released after the specified amount of time has elapsed. For more information about the **stp-callproc** command, see Appendix A, "MML User Interface and Command Reference."

Starting Call Processing

To start call processing, use the **sta-callproc** MML command. For more information about this command, see Appendix A, "MML User Interface and Command Reference."

Stopping the Call Processing Application

To stop the call processing application, use the **stp-softw** MML command. For more information about this command, see Appendix A, "MML User Interface and Command Reference."

Starting the Call Processing Application

To start the call processing application, use the **sta-softw** MML command. For more information about this command, see Appendix A, "MML User Interface and Command Reference."

Reporting the Cisco HSI Status

To display the status of the Cisco HSI, use the **rtrv-softw** MML command. For more information about this command, see Appendix A, "MML User Interface and Command Reference."

Measurements

The following sections describe two measurement categories:

- System-related measurements
- Call-related measurements

System-Related Measurements

The CIagent is a Simple Network Management Protocol (SNMP) subagent. It handles the collection and storage of the following system performance measurements:

- CPU occupancy
- RAM occupancy
- Disk occupancy
- TCP usage

Use the CIAGENTSCANPERIOD parameter to define the period that the CIagent polls the CPU for utilization (see Chapter 3, "Provisioning the Cisco HSI").

Call-Related Measurements

The Cisco HSI application handles all call-related measurements. An SNMP MIB handles the collection of call-related measurement data.

The call-related measurements are organized into counter groups. The following MML counter groups are required:

- RAS (see Table 4-1 on page 4-3)
- Q.931 (see Table 4-2 on page 4-4)
- H.245 (see Table 4-3 on page 4-5)

The measurements in these groups are written to a file on disk every 30 minutes. The file name includes the date and time that measurements were written to disk.

Table 4-1 RAS Counter Group

Counter Name	Measurement	Type	Comments
GK_DISC_ATT_TOT	Gatekeeper discovery attempts	Integer	Incremented for every unicast gatekeeper request (GRQ) sent or for every multicast operation
GK_REG_ATT_TOT	Registration request attempts	Integer	Incremented for every registration request (RRQ) sent
GK_REG_SUCC_TOT	Registration request successes	Integer	Incremented for every registration confirmation (RCF) received
GK_RCV_UNR_ATT_TOT	GK- initiated unregistration attempts	Integer	Incremented for every unregistration request (URQ) received from a gatekeeper (GK)
GK_XMIT_UNR_SUCC_TOT	GK-initiated unregistration successes	Integer	Incremented for every unregistration confirmation (UCF) sent to a GK
GK_XMIT_UNR_ATT_TOT	T- initiated unregistration attempts	Integer	Incremented for every URQ sent to a GK
GK_RCV_UNR_SUCC_TOT	T- initiated unregistration successes	Integer	Incremented for every UCF received from a GK
GK_RLS_ATT_TOT	Disengage attempts	Integer	Incremented for every disengage request (DRQ) sent to a GK
GK_RLS_SUCC_TOT	Disengage successes	Integer	Incremented for every disengage confirmation (DCF) returned by a GK
GK_INFO_REPORT_TOT	Information reports	Integer	Incremented for every information request (IRQ) sent to the GK

Table 4-2 Q.931 Counter Group

Counter Name	Measurement	Type	Comments
FC_INC_CALL_ATT_TOT	H.225 Incoming Fast Connect Call Attempts	Integer	Incremented when a setup containing the fastStart element is received.
FC_INC_CALL_SUCC_TOT	H.225 Incoming Fast Connect Call Successes	Integer	Incremented when the Fast Connect procedure is used to establish an incoming H.323 call.
FC_OTG _CALL_ATT_TOT	H.225 Outgoing Fast Connect Call Attempts	Integer	Incremented when a setup containing the fastStart element is sent to an H.323 endpoint. Decremented when you revert to Version 1 signaling (another measurement incremented).
FC_OTG_CALL_SUCC_TOT	H.225 Outgoing Fast Connect Call Successes	Integer	Incremented when the Fast Connect procedure is used to establish an outgoing H.323 call.
V1_INC_CALL_ATT_TOT	H.225 Incoming Version 1 Call Attempts	Integer	Incremented when an incoming H.323 Version 1 Setup is received (that is, no fastStart element or H.245 tunneling).
V1_INC_CALL_SUCC_TOT	H.225 Incoming Version 1 Call Successes	Integer	Incremented when an incoming H.323 Version 1 call is established.
V1_OTG_CALL_ATT_TOT	H.225 Outgoing Version 1 Call Attempts	Integer	Incremented when an outgoing H.323 call reverts to Version 1 signaling.
V1_OTG_CALL_SUCC_TOT	H.225 Outgoing Version 1 Call Successes	Integer	Incremented when an outgoing H.323 call using Version 1 is established.
INC_NORM_REL_TOT	H.225 Incoming Call Normal Releases	Integer	Incremented when an established incoming H.323 call is taken down due to user on-hook.
INC_ABNORM_REL_TOT	H.225 Incoming Call Abnormal Releases	Integer	Incremented when an established incoming H.323 call is taken down due to anything other than user on-hook.
OTG_NORM_REL_TOT	H.225 Outgoing Call Normal Releases	Integer	Incremented when an established outgoing H.323 call is taken down due to user on-hook.
OTG_ABNORM_REL_TOT	H.225 Outgoing Call Abnormal Releases	Integer	Incremented when an established outgoing H.323 call is taken down due to anything other than user on-hook.
PGW_T38_FAX_ATT_TOT	Q931	Integer	Incremented for each T.38 Fax Call request from the PGW. Collection Intervals are provisionable (default is 12 hours).
PGW_T38_FAX_SUCC_TOT	Q931	Integer	Incremented for each T.38 Fax Call request from the PGW that is successfully reconfigured for T.38. Collection Intervals: Provisionable (default 12 hours)
H323_INTERWORK_SUCC_	Q931	Integer	Incremented for each successful H.323-H.323 interworking condition. Collection Intervals are provisionable (default is 12 hours).

Table 4-3 H.245 Counter Group

Counter Name	Measurement	Type	Comments
MASTER_SLAVE_ATT_TOT	H.245 Master Slave Determination Attempts	Integer	Incremented whenever either side of the call initiates the master slave determination procedure (using either H.245 tunneling or a separate H.245 signaling path).
MASTER_SLAVE_SUCC_TOT	H.245 Master Slave Determination Successes	Integer	Incremented whenever a master slave determination procedure is completed.
TERM_CAP_XCHG_ATT_TOT	H.245 Terminal Capability Exchange Attempts	Integer	Incremented whenever either side of the call initiates the capability exchange procedure (using either H.245 tunneling or a separate H.245 signaling path).
TERM_CAP_XCHG_SUCC_TOT	H.245 Terminal Capability Exchange Successes	Integer	Incremented whenever a capability exchange procedure is completed.
OPEN_CH_ATT_TOT	H.245 Open Logical Channel Attempts	Integer	Incremented whenever either side of the call initiates the open logical channel procedure (using either H.245 tunneling or a separate H.245 signaling path).
OPEN_CH_SUCC_TOT	H.245 Open Logical Channel Successes	Integer	Incremented whenever an open logical channel procedure is completed.
CLOSE_CH_ATT_TOT	H.245 Close Logical Channel Attempts	Integer	Incremented whenever either side of the call initiates the close logical channel procedure (using either H.245 tunneling or a separate H.245 signaling path).
CLOSE_CH_SUCC_TOT	H.245 Close Logical Channel Successes	Integer	Incremented whenever a close logical channel procedure is completed.
AVG_ROUND_TRIP_DELAY	H.245 Round Trip Delay Determination	Average (ms)	The average time in milliseconds (ms) for round trip delay measured as a result of successful round trip delay determination procedures.
EMPTY_CAP_SET_TOT	H245	Integer	Incremented each time an empty cap set request is received from the remote peer. Collection intervals are provisionable (default is 12 hours).
H323_T38_FAX_ATT_TOT	H245	Integer	Incremented for each T.38 Fax Call request from the remote peer. Collection intervals are provisionable (default is 12 hours)
H323_T38_FAX_SUCC_TOT	H245	Integer	Incremented for each T.38 Fax Call request from the remote peer that is successfully reconfigured for T.38 fax working. Collection intervals are provisionable (default is 12 hours).

Table 4-3 H.245 Counter Group (continued)

Counter Name	Measurement	Type	Comments
ASYMMETRIC_TOT	H245	Integer	Incremented for each asymmetric condition encountered. Collection intervals are provisionable (default is 12 hours).
DTMF_ RELAY_ TOT	H245	Integer	Incremented for each call where DTMF relay is used. Collection intervals are provisionable (default is 12 hours).

Resetting Measurements

The **clr-meas** MML command resets the measurement counters. This command resets an individual counter or all counters in a counter group. The following are valid counter groups:

- RAS
- Q.931
- H.245

For more information about the **clr-meas** command, see Appendix A, "MML User Interface and Command Reference."

Retrieving Counters

Use the **rtrv-ctr** MML command to retrieve measurement counters. This command displays the measurements for a counter group. Valid counter groups are RAS, Q.931, and H.245. For more information about the **rtrv-ctr** command, see Appendix A, "MML User Interface and Command Reference."

Overload

The system continuously checks call totals and CPU utilization. Each of these values is compared to predefined limits. Three call total limits are available. Each limit has a hysteresis value and an alarm associated with it. When the call total reaches the limit, an alarm is raised. When the call total falls below the limit minus the hysteresis value, the alarm is cleared after the appropriate recovery action is taken.

Cisco HSI supports the following three levels of overload:

- Overload level 1
- Overload level 2
- Overload level 3

The following factors can trigger any one of the overload levels:

- CPU usage (the OVLDSAMPLERATE parameter defines the frequency of CPU sampling and threshold checking)
- Maximum calls allowed

Disk usage can trigger a LOW_DISK_SPACE alarm. For more information about this alarm, see Chapter 5, "Troubleshooting Cisco HSI Alarms."

Overload Level 1

Use the following configuration parameters for overload level 1 (see Chapter 3, "Provisioning the Cisco HSI"):

- OVLDLEVEL1PERCENT
- OVLDLEVEL1FILTER
- OVLDLEVEL1THRESHLOWERCALLS
- OVLDLEVEL1THRESHUPPERCALLS
- OVLDLEVEL1THRESHLOWERCPU
- OVLDLEVEL1THRESHUPPERCPU

Overload Level 2

Use the following configuration parameters for overload level 2 (see Chapter 3, "Provisioning the Cisco HSI"):

- OVLDLEVEL2PERCENT
- OVLDLEVEL2FILTER
- OVLDLEVEL2THRESHLOWERCALLS
- OVLDLEVEL2THRESHUPPERCALLS
- OVLDLEVEL2THRESHLOWERCPU
- OVLDLEVEL2THRESHUPPERCPU

Overload Level 3

Use the following configuration parameters for overload level 3 (see Chapter 3, "Provisioning the Cisco HSI"):

- OVLDLEVEL3PERCENT
- OVLDLEVEL3FILTER
- OVLDLEVEL3THRESHLOWERCALLS
- OVLDLEVEL3THRESHUPPERCALLS
- OVLDLEVEL3THRESHLOWERCPU
- OVLDLEVEL3THRESHUPPERCPU

Setting Overload Data

The following MML commands set overload data:

set-overload:level1|level2|level3:cpu, lower=*number***, upper=***number*

set-overload:level1|level2|level3:calls, lower=*number***, upper=***number*

set-overload:level1|level2|level3:gap, filter=normal|all, percent=*number*

The upper parameter specifies the threshold for overload detection, and the lower parameter specifies the hysteresis point at which the overload condition is removed.

The lower value should be greater than the upper value of the next lower severity level.

For example:

set-overload:level1:cpu, lower=45, upper=50

set-overload:level1:gap, filter=normal, percent=50

set-overload:level2:cpu, lower=63, upper=70

set-overload:level2:gap, filter=normal, percent=75

set-overload:level3:cpu, lower=81, upper=90

set-overload:level3:gap, filter=normal, percent=95

These values mean that:

- At less than 50 percent CPU usage, no call is gapped.
- From 50 percent to 70 percent CPU usage, 50 percent of calls are gapped.
- From 70 percent to 90 percent CPU usage, 75 percent of calls are gapped.
- At more than 90 percent CPU usage, 95 percent of calls are gapped.
- Before the overload level returns from level 3 to level 2, the CPU usage must fall to less than 81 percent.

Note The HSI sends a Release message to the PGW when gapping calls. The cause value is derived from the property CCPackage,A_CC_GAPPEDCALLCAUSE, which is set to 60 (Congestion) in the default configuration. Cisco recommends configuring the Cisco PGW2200 dial plan to reroute the call when it receives this release cause.

Refer to the *Cisco Media Gateway Controller Software Release 9 Provisioning Guide* for further information.

Retrieving Overload Data

Use the **rtrv-overload** MML command to display the overload status and related overload data. For information about this command, see Appendix A, "MML User Interface and Command Reference."

Logging

The logging level of one or more service packages is set using the **set-log** MML command. For more information about this command, see Appendix A, "MML User Interface and Command Reference."

Rotating Log Files

Log files are rotated at system startup or when either of the following conditions occurs:

- The size limit for the corresponding file is reached. The size of the corresponding log file is equal to or greater than the value that the LOGFILEROTATESIZE configuration parameter specifies. The default value for this parameter is 10 Mb (see Chapter 3, "Provisioning the Cisco HSI").
- The age limit for the corresponding file is reached. The corresponding log file is equal to or older than the interval that the LOGFILEROTATEINTERVAL parameter specifies. The default value for this parameter is 1440 minutes (24 hours). See Chapter 3, "Provisioning the Cisco HSI," for more information about this parameter.

Convention for Naming the Log File

Log rotation occurs when the system ceases to write to the current log file and commences to write to a new log file. The LOGFILENAMEPREFIX parameter defines the name of the active log file (see Chapter 3, "Provisioning the Cisco HSI"). The default is platform.log.

When log rotation is triggered, the existing file (for example, platform.log) is renamed with the format *platform_yyyymmddhhmmss.log* (see Table 4-4). For example, a platform error file rotated on September 30, 1999 at 12:36:24 is renamed platform_19990930123624.

Table 4-4 Log Filename Format

Format	Definition
LOGFILENAMEPREFIX	Provisioned filename (default is platform.log)
yyyy	Year
mm	Month
dd	Day
hh	Hour
mm	Minute
ss	Second

Note The time stamp is the coordinated universal time (CUT) from the machine at the time of rotation.

Log File Location

The LOGDIRECTORY parameter defines the directory for active log files and rotated log files (see Chapter 3, "Provisioning the Cisco HSI"). The default is $GWHOME/var/log/.

Log Messages

Log messages have the following format:

Date and timestamp, Package Name, <log level>, LogID:<text of the message>.

The following are examples of log messages:

```
Thu Dec  7 03:55:32:837 2000, Infrastructure, <DEBUG>, 205: GWModule Registration -
shutdownList() - NbOfItems 10 - Item 8
Thu Dec  7 03:55:32:837 2000, Infrastructure, <DEBUG>, 206 : GWModuleRegistration -
shutdownList() - NbOfItems 10 - Item 9
Thu Dec  7 03:55:32:838 2000, Infrastructure, <DEBUG>, 207 : GWReactor::thdId() returns 6.
Thu Dec  7 03:55:32:838 2000, Infrastructure, <DEBUG>, 208 : GWReactorModule::shutdown() -
Thread has joined.
```

Log Message Packages

The following service packages can log messages:

- Application
- CallControl
- Connection
- DataManager
- Eisup
- FaultManager
- Gapping
- H323
- Infrastructure
- Overload
- ProcessManager
- Provisioning
- Signal
- Snmp
- SnmpSubagent
- Statistics
- Trace
- UserInterface

Logging Levels

Logging levels determine how much debug information is stored in the platform.log file for each package. Levels are set through use of a hexadecimal number between 0x0000 and 0xFFFF. 0x0000 is the lowest level, and switches off logging for a particular package. 0xFFFF is the highest logging level.

Note We strongly recommend that you set all packages to log level 0x0000 in a live network. Set them to higher levels only when you debug on an offline network.

Setting Logging Levels

The **set-log** MML command dynamically alters the log level setting during the execution of the system. However, the **set-log** MML command does not affect the logging level of any current MML processes. For more information about the **set-log** command, see Appendix A, "MML User Interface and Command Reference."

Note The enabling of logging severely impacts HSI performance. We recommend the HSI be running at less than 2 calls per second when you enable logging. Logging will be automatically disabled when the HSI enters overload level 3. You can reenable logging when the HSI exits overload.

RADVision Logging

The Cisco HSI application provides the capability (through MML) to initiate RADVision logging. The contents of the resultant log file are not under the control of the Cisco HSI application.

Use the **radlog** MML command to start and stop RADVision logging. RADVision logging can be directed to a file or into the standard logging output. For information about this command, see Appendix A, "MML User Interface and Command Reference."

Gapping

The gapping level can be set from 0 to 100 percent. From 0 to 99 percent, the call type (normal or priority) is checked against the gapping level call status type. At 100 percent gapping, all calls are gapped regardless of call type.

Setting Gapping

To activate call gapping, complete the following steps:

Step 1 Determine the direction of the call to be gapped:

- Incoming (inc) for calls originating from the H.323 network
- Outgoing (otg) for calls originating from the PSTN Gateway (PGW 2200)
- Both (both) for calls originating from either side

Step 2 Determine what type of calls are to be gapped:

- Normal calls (nonpriority calls)
- All calls

Step 3 Determine the percentage of calls to be gapped. The percentage can range from 0 to 100 percent. If 100 percent is selected, all calls are gapped, regardless of the type of call.

Step 4 Enter the **set-gapping** MML command. For example, to gap 60 percent of all calls for both directions, enter:

set-gapping:both:calltype=all,percent=60

Retrieving Call Gapping Data

To retrieve the current levels of call gapping for all gapping clients, enter the **rtrv-gapping** command. The command displays text similar to the following:

```
Client Name       Direction         Level             Call Type         Active

Overload          Outgoing          10                Normal            No
Overload          Incoming          10                Normal            No
MML               Outgoing          20                All               Yes
MML               Incoming          30                All               Yes
```

The output shows the gapping levels set by the overload function and the MML command **set-gapping**. The highest gapping level is used as the level to gap calls, which is indicated as Yes in the column titled Active. In this example, the MML levels for outgoing and incoming calls are active.