



# Using Polling to Monitor Network Performance

---

## Introduction to Performance Monitoring

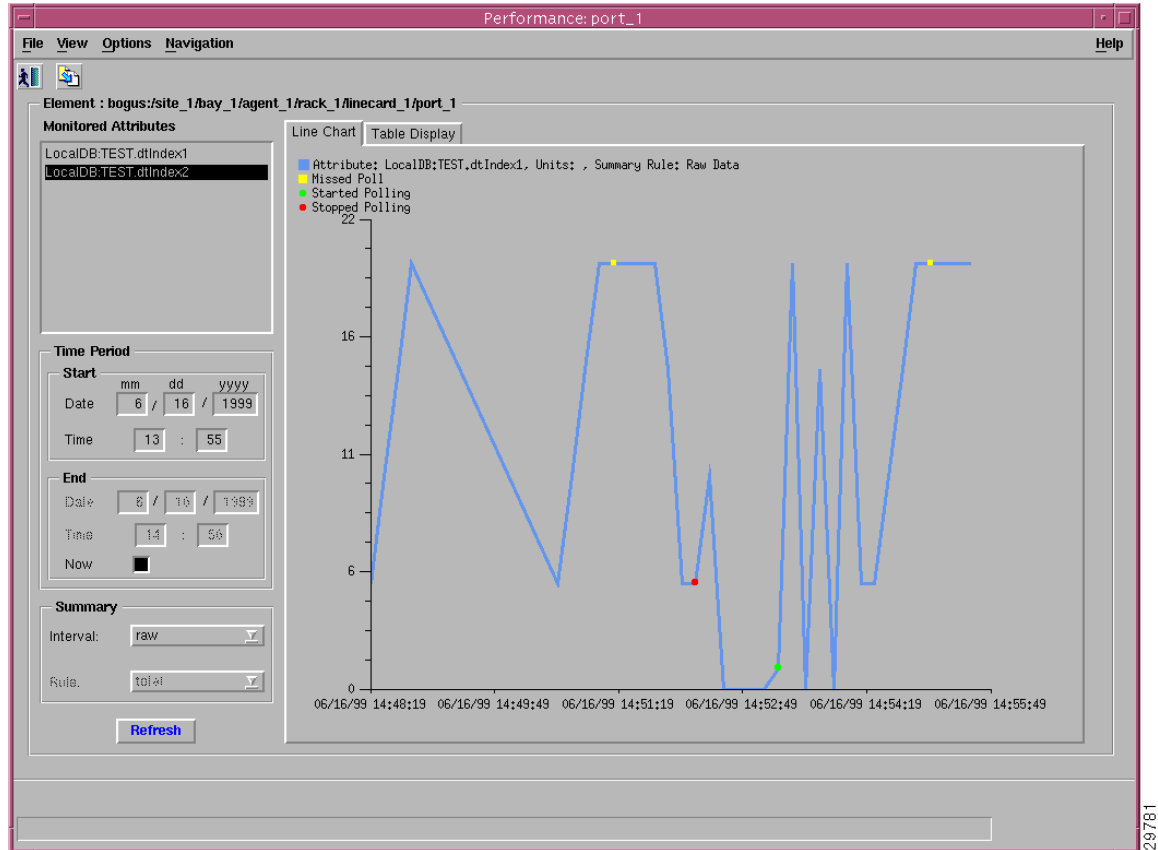
An important component of efficient network management is the ability to receive performance information on a large network of many devices to provide an overall view of the your network's functioning. You can then pro-actively manage your network elements by analyzing the performance data.

CMNM lets you monitor the performance statistics gathered from network elements managed by CEMF. CMNM collects performance information from the Cisco MGC node, allowing you to monitor the health and performance of the network. You can display the performance information. You can also view performance data associated with a given object and graph that data over time. CMNM collects performance information from all of the components of the Cisco MGC node. You can configure the objects being polled and the frequency of the polling.

Cisco MGC allows you to specify how long performance data should be kept in the database. You can also specify rollup-rules and other actions that should be taken on performance data after a set length of time.

The Performance Manager is opened from the Network Maps, Event Browser, or Object Manager by selecting **Performance Manager** from the pop-up menu available on a selected object. A screen similar to Figure 7-1 is displayed.

Figure 7-1 Performance Manager Screen



A selected object or group of objects has a number of different attributes. You can choose to monitor an area of the network, for example, the performance statistics of a particular attribute. This information could then be used to evaluate the performance of specific equipment and assess the requirements for upgrades or software downloads.

Performance statistics also provide a summary view of the performance of network elements. These statistics help you determine the degree to which the network is meeting assigned service levels. You are able to drive down to the chassis level from the network level in a simple manner if you want to view individual chassis statistics.

CMNM Performance Manager can present data in two ways:

- **Raw**—This is performance data in its most detailed format (not summarized). History storage criteria defines which attributes are to be monitored on specified objects. When these objects are polled, the retrieved data is stored by CEMF and can be viewed using the Performance Manager. This data is raw data. History storage criteria may also specify summary intervals and rules to be applied to the raw data. The resultant data is summarized data.
- **Summarized**—This gives derived summaries of raw data. This is an approach which displays the data at a level appropriate to the task in hand; for example, you may decide to view data summarized in hourly or daily intervals according to requirements.

Performance data has the potential to overwhelm. For example, you may wish to view the Errored Packets for a device over a six-month interval. If the data was displayed in a table or graph at the rate at which it was sampled, this could be tens of thousands of values. In these circumstances, it is preferable to view summaries of the data. For example, if data was originally received at intervals of 5 minutes, the

ability to view it summarized in hourly, daily, or weekly intervals would be an excellent way of managing the network. History storage criteria can be used to specify these summary intervals and the rules which are used to generate the summaries for the history storage criteria's objects and attributes.

Hourly summaries are generated on the hour, daily summaries are generated at midnight, and weekly summaries are generated at midnight on Sundays (that is, the end of Sundays). For example, if polling starts at 9:30 and hourly summaries are to be generated, the first full hour's worth of data is between 10:00 and 11:00. So at 11:00, the first hourly summary is generated, and given a timestamp of 10:00. The same pattern is followed for all summaries (daily, weekly, or user-defined). This pattern standardizes summary intervals so that all attributes' summaries have the same timestamps.

**Note**

---

Data generated between 9:30 and 10:00 is ignored in the above example, because an hourly summary for 9:00 to 10:00 would be misleading as it would have been generated using only half the usual number of values.

---

In some cases, an object may fail to be polled; for example, if communication to the object is lost. This is referred to as a missed poll, and all missed polls are indicated on Performance Manager graphs and charts.

Performance Manager graphs and charts also indicate when an attribute started and stopped being polled due to history storage criteria being added, edited, or removed. You are therefore able to see when polling on an attribute started, the attribute's values while it was being polled (and any missed polls), and finally when the attribute stopped being polled.

A Performance Manager can be opened for each network element you wish to monitor. To view up-to-date information on the Performance Manager, click **Refresh** and the selected data is displayed.

## How Performance Data Is Collected

Depending on the type of device, performance data is collected in different ways.

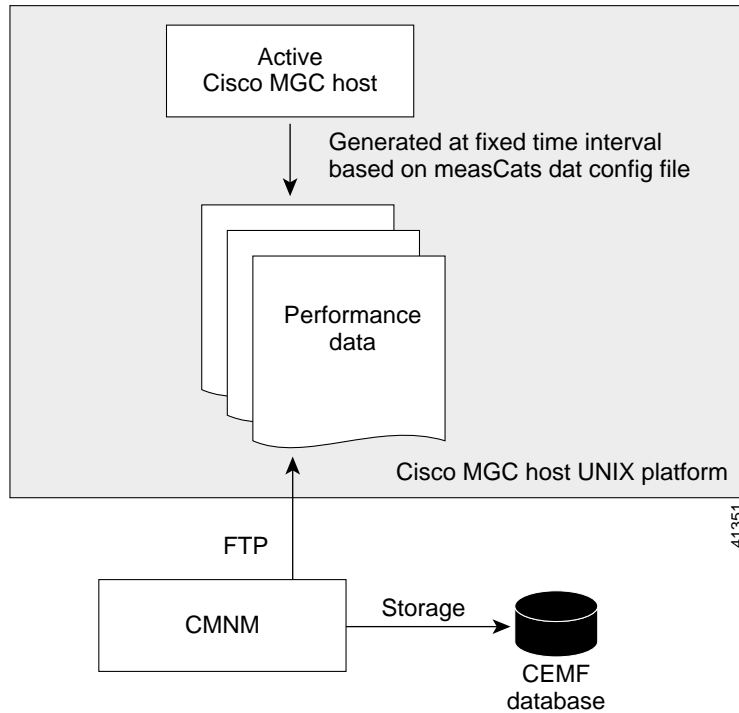
- Performance data for the active Cisco MGC host is collected by retrieving flat files at user-defined intervals.
- CMNM collects performance data from the Cisco SLT and LAN switch using the standard SNMP mechanisms.

## Performance Data Collected for the Active Cisco MGC Host

Collection of performance data from the active Cisco MGC host is different from the other Cisco MGC node devices. CMNM does not use SNMP to collect this data. Rather, the Cisco MGC host software writes out performance data files at a predefined time interval. The actual data written out is defined by you in the Cisco MGC host configuration file `measCats.dat`.

Periodically CMNM transfers (using FTP) these performance files from the active Cisco MGC host, parses them, and loads the performance data directly into the CEMF database. Note that no data is ever collected from a Cisco MGC host in standby mode.

Figure 7-2 Cisco MGC Host Performance Collection



CMNM does not predefine which performance statistics are collected from the Cisco MGC host. You must configure the Cisco MGC host software to collect performance data, and CMNM simply processes whatever data is available.

CMNM always polls the active Cisco MGC host for performance data. In the event of a failover, CMNM automatically starts polling the new active Cisco MGC host (that is, the former standby host). All existing performance data is maintained.

CMNM collects only the performance measurement data that the Cisco MGC host generates. However, CMNM provides the ability to filter out specific performance measurements. This is accomplished by editing the Cisco MGC host performance filter file located in *install directory/config/hostController/perfMeasFilters*.

This file contains a list of collected Cisco MGC host measurements and allows for the filtering of these measurements by both measurement name and component name. Individual measurements can be turned off by commenting out the measurement line (with #) or by simply removing the measurement line.

This file is first read at CMNM startup and upon receipt of configuration change traps from the Cisco MGC host.

## Common Performance Data Collected for the Cisco SLT and LAN Switch

The performance counters collected for each Cisco SLT and LAN switch are described in Table 7-1.

Table 7-1 Cisco SLT and LAN Switch Performance Counters

Counter	Description
RFC1213-MIB.tcpMaxConn	Total number of TCP connections the entity can support.

*Table 7-1 Cisco SLT and LAN Switch Performance Counters*

RFC1213-MIB.tcpActiveOpens	Number of times TCP <sup>1</sup> connections have made a direct transition to the SYN-SENT state from the CLOSED state.
RFC1213-MIB.tcpPassiveOpens	Number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
RFC1213-MIB.tcpAttemptFails	Number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
RFC1213-MIB.tcpEstabResets	Number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
RFC1213-MIB.tcpCurrEstab	Number of TCP connections for which the current state is either ESTABLISHED or CLOSE-WAIT.
RFC1213-MIB.tcpInSegs	Total number of segments received, including those received in error.
RFC1213-MIB.tcpOutSegs	Total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.
RFC1213-MIB.tcpRetransSegs	Total number of segments retransmitted—that is, the number of TCP segments transmitted containing one or more previously transmitted octets.
RFC1213-MIB.tcpInErrs	Total number of segments received in error (for example, bad TCP checksums).
RFC1213-MIB.tcpOutRsts	Number of TCP segments sent containing the RST flag.
RFC1213-MIB.udpInDatagrams	Total number of UDP <sup>2</sup> datagrams delivered to UDP users.
RFC1213-MIB.udpNoPorts	Total number of received UDP datagrams for which there was no application at the destination port.
RFC1213-MIB.udpInErrors	Number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
RFC1213-MIB.udpOutDatagrams	Total number of UDP datagrams sent from this entity.

1. Transmission Control Protocol

2. User Datagram Protocol

## Performance Data Collected for the Cisco SLT Network Interfaces

The performance counters collected for each network interface on the Cisco SLT are described in Table 7-2.

*Table 7-2 Cisco SLT Ethernet and TDM Interface Performance Counters*

Counter	Description
IF-MIB.ifInErrors	Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
IF-MIB.ifInOctets	Total number of octets received on the interface, including framing characters.
IF-MIB.ifOutErrors	Number of outbound packets that could not be transmitted because of errors.
IF-MIB.ifOutOctets	Total number of octets transmitted out of the interface, including framing characters.

The counters described in Table 7-3 are collected for each TDM interface to the SS7 network.

*Table 7-3 Cisco SLT TDM Interface Performance Counters*

Counter	Description
RFC1406-MIB.dsx1CurrentESs	Number of errored seconds encountered by a DS1 interface in the current interval.
RFC1406-MIB.dsx1CurrentSEsS	Number of severely errored seconds encountered by a DS1 interface in the current interval.

## Performance Data Collected for the LAN Switch Network Interfaces

The performance counters collected for each network interface on the LAN switch are described in Table 7-4.

*Table 7-4 LAN Switch Interface Performance Counters*

Counter	Description
IF-MIB.ifInErrors	Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
IF-MIB.ifInOctets	Total number of octets received on the interface, including framing characters.
IF-MIB.ifOutErrors	Number of outbound packets that could not be transmitted because of errors.
IF-MIB.ifOutOctets	Total number of octets transmitted out of the interface, including framing characters.

## Opening the Performance Manager

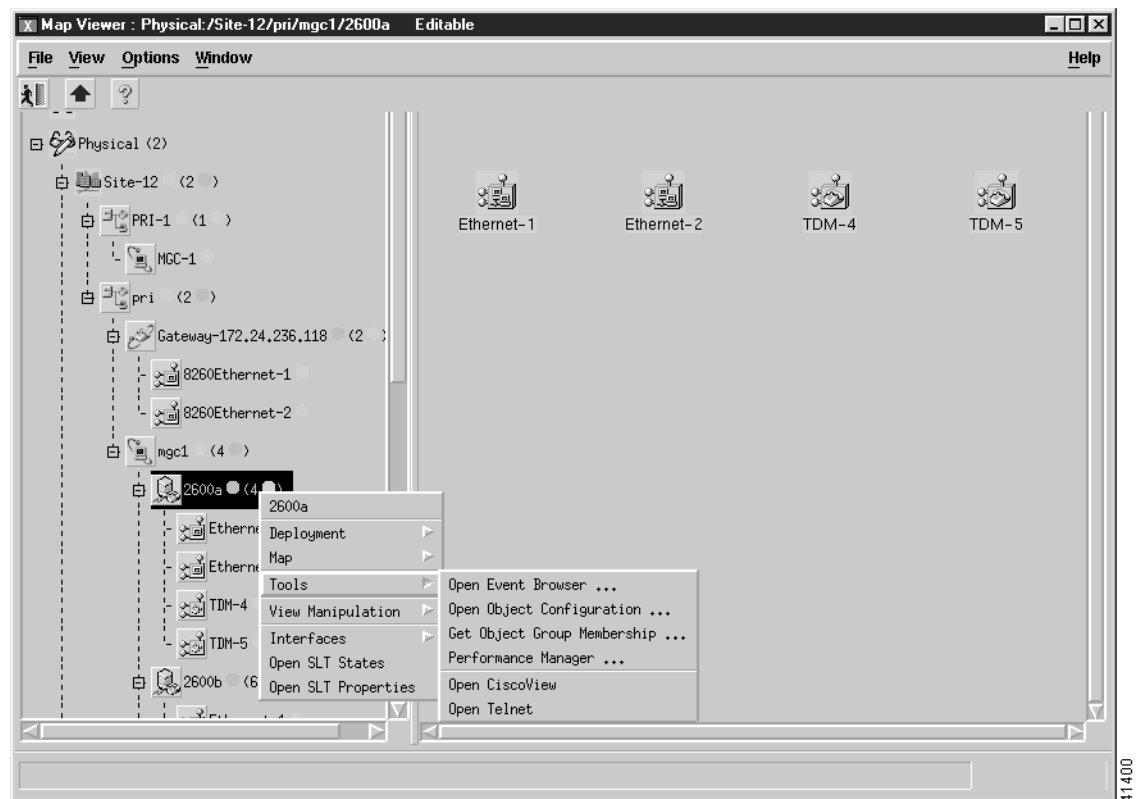
The Performance Manager can be accessed from pop-up menus on selected objects in the following applications:

- Network Maps
- Event Browser
- Object Manager

To open Performance Manager:

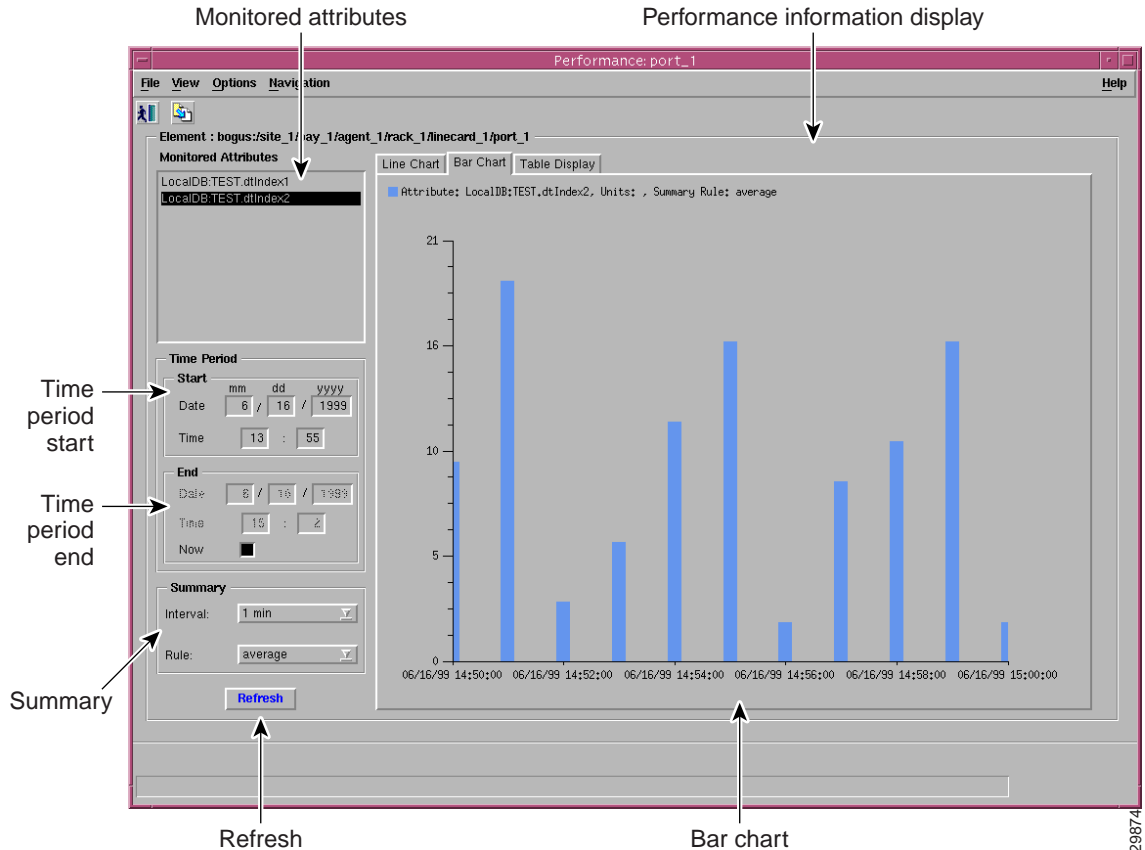
- Step 1 Open the appropriate window to display a relevant object.
- Step 2 Place the cursor over the object.
- Step 3 Press and hold the right mouse button.
- Step 4 Move the cursor until the **Tools** option is highlighted, then highlight the **Performance Manager** option, as shown in Figure 7-3.

Figure 7-3 Map Viewer Screen—Tools->Performance Manager Option



- Step 5 Release the right mouse button.
- You see the Performance Manager screen shown in Figure 7-4.

Figure 7-4 Performance Manager Screen



From the Performance Manager screen you can:

- Identify all monitored attributes on a selected managed object.
- Identify all time periods configured for sampling each monitored attribute.
- Identify all summary methods configured for selected monitored attributes and selected summary periods.
- View historical performance data over a requested period of time (in tabular or graphical format).
- Print performance data to a printer or file.

## Setting Polling Frequencies

You can set the polling frequency for the various types of devices. While you can specify a separate polling frequency for the Cisco SLTs, the LAN switches, and the Cisco MGC hosts, you cannot set a separate polling frequency for an individual device.

### Changing Collection Defaults

CMNM predefines which performance statistics are collected and simply processes whatever data is available. However, the Cisco MGC host allows you to change these defaults by editing the Cisco MGC host filter file `perfMeasFilters`. Use the following commands:



```
install directory/config/hostController
perfMeasFilters
```

Measurements can be turned on or off by commenting out the line with # or by deleting the line.

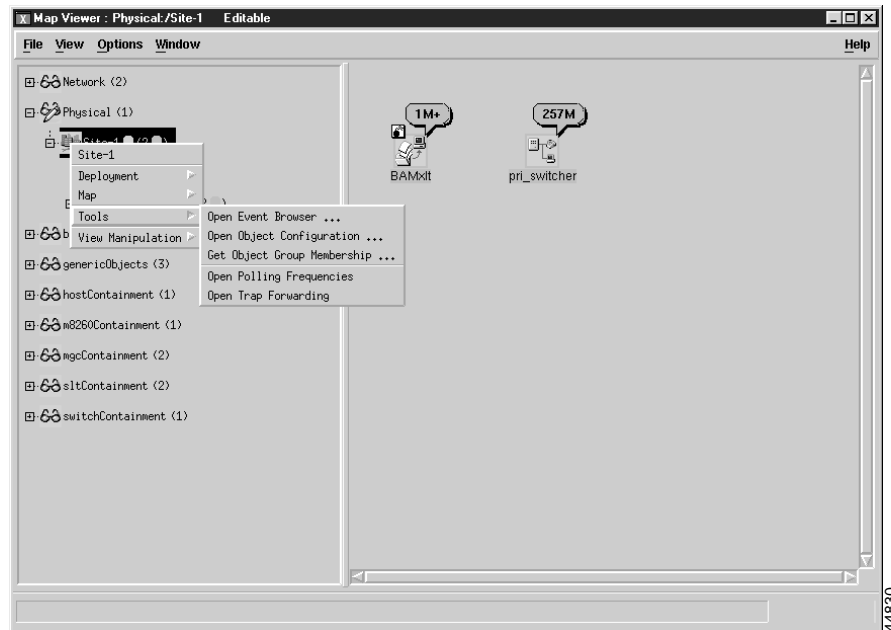
## Changing Polling Frequency

You can define the polling frequency for the various devices, but you should not set the CMNM polling frequency to be less than the Cisco MGC host polling frequency. However, you can increase the CMNM polling frequency so that not all of the Cisco MGC host performance files are processed. For example, you can set Cisco MGC host performance data collection to only once a day.

To configure the polling frequency:

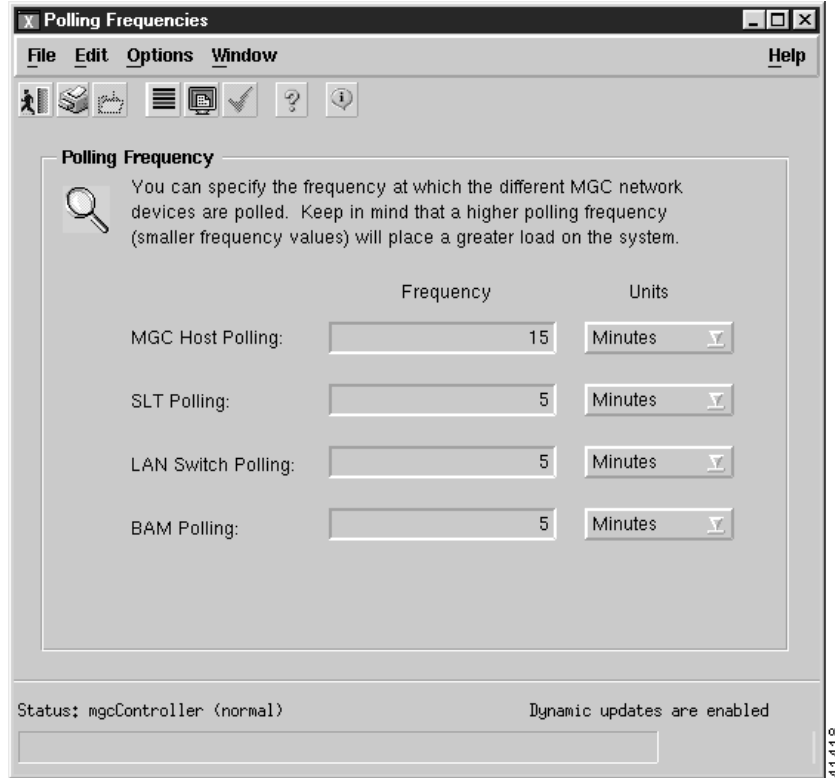
- 
- Step 1 Select the site icon on the Map Viewer.
  - Step 2 Right-click to display the pull-down menu, select **Tools**, then **Open Polling Frequencies** as shown in Figure 7-5.

*Figure 7-5 Map Viewer Screen—Tools>Polling Open Polling Frequencies Option*



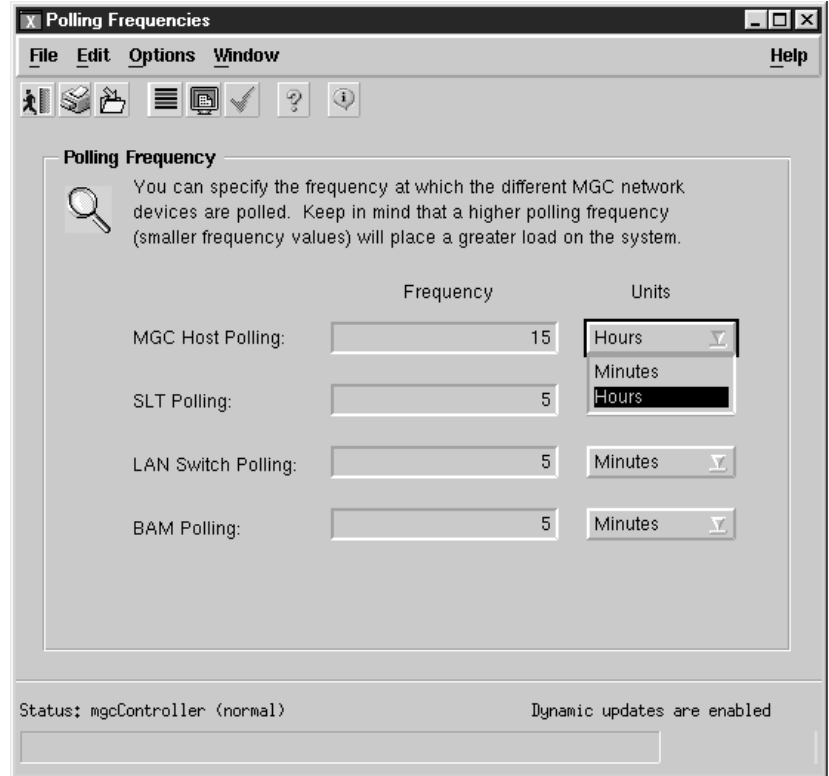
You see the screen in Figure 7-6.

Figure 7-6 Polling Frequencies Screen



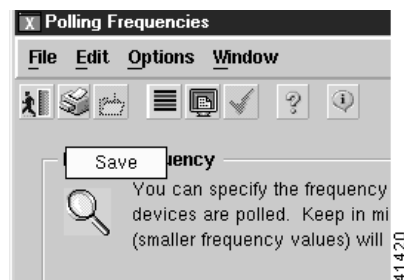
- Step 3** Select a polling frequency from the menu. To change from minutes to hours, select from the pull-down menu, as shown in Figure 7-7.

Figure 7-7 Polling Frequencies Screen—Frequency Pull-down Menu



Step 4 To save the polling frequencies you just set, click the **Save** icon as shown in Figure 7-8.

Figure 7-8 Save Polling Frequencies Screen



## Starting Polling On a Device

By default, performance data is not collected for any object. When an object is first deployed in CEMF, it is in the normal state; no performance polling is done. To enable performance polling, you must transition the object into the polling state. This is done using the dialogs posted from the object. CMNM allows you to transition either a single object or a group of objects between the normal and polling states.








## Understanding the Different Polling States of a Device

When an object is polling, its icon is augmented with a small annotation. Each LAN switch, Cisco SLT, and common Cisco MGC host object has this icon when polling. In addition, the Cisco MGC node object has the polling icon if any of its children are doing polling. In this way, the states of the Cisco MGC subobjects are reflected up to the Cisco MGC node object.

CMNM uses many different indicators to indicate the logical state of a device. On the right side of the Map Viewer, the icon representing each device is shown. For some states, a small symbol is placed near the top of the icon to indicate a logical state. In addition, cross-hatching is used to indicate state information.

Table 7-5 shows the different logical states.

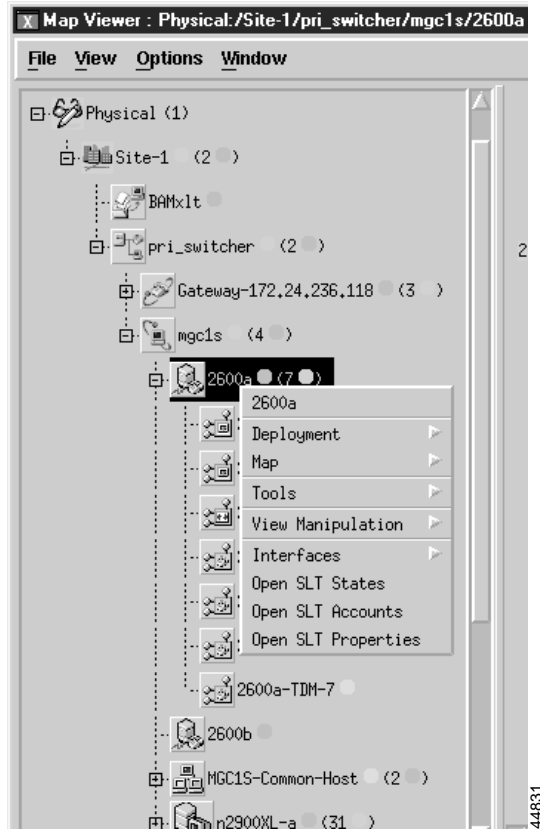
*Table 7-5 State Symbols*

State Symbol	Description
	Indicates that the object is in the process of discovering. The icon also has a hatch pattern.
	Indicates that the object is terminating or is out-of-service. Icon also has a hatch pattern.
	Indicates that the object is performing polling.
	Indicates that the device is not SNMP reachable. This may be because the device is off the network or its SNMP agent is not responding.
	Indicates that some major service or software process on the device has failed. The icon also has a hatch pattern.
	Indicates that the device is off-duty or administratively down.
	Indicates that the device is providing service (active).
	Indicates that the device is running in warm standby mode (standby).
	A hatch-pattern (without any corresponding state symbol) is used to indicate that the device is not being managed (decommissioned).

To place a device into a polling state so that data can be collected (this example uses the Cisco SLT, but the procedure is the same for each device):

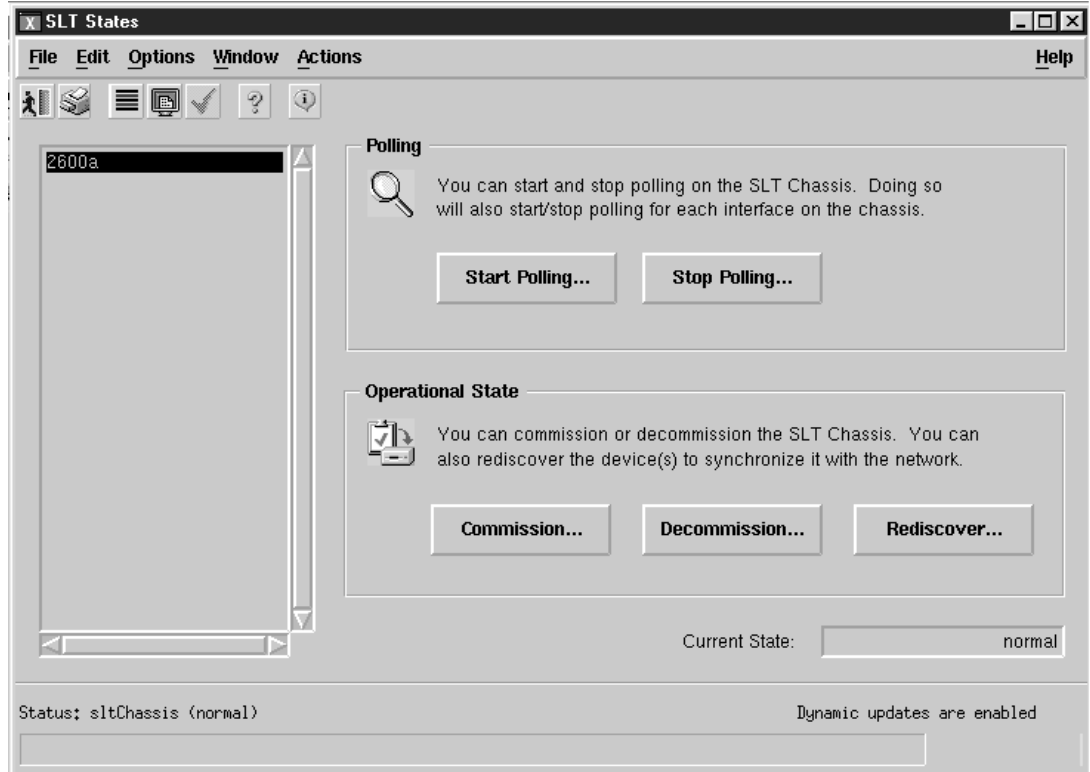
- 
- Step 1** Click the network or device, right-click to display the pull-down menu, then select **Open SLT States** as shown in Figure 7-9.

Figure 7-9 Map Viewer Screen—Open SLT States Option



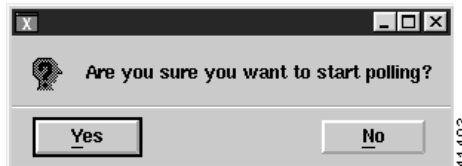
You see the screen in Figure 7-10.

Figure 7-10 SLT States Screen

**Step 2** Click **Start Polling**.

You see the screen in Figure 7-11.

Figure 7-11 Polling Configuration Prompt

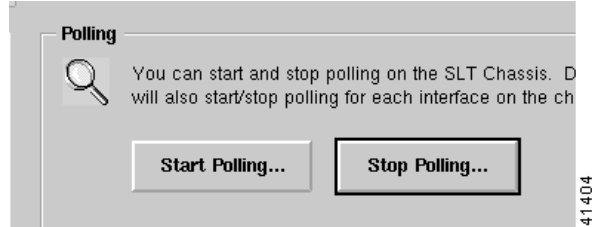
**Step 3** Click **Yes** to proceed.

To stop polling at anytime during the process, click **Stop Polling**, as shown in Figure 7-12.

**Note**

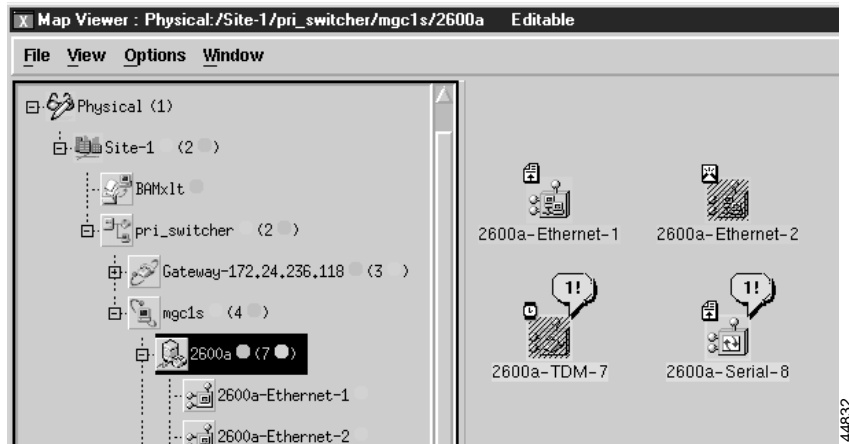
Starting and stopping polling on the Cisco MGX 8260, Cisco SLTs, and LAN switch also starts or stops polling for each interface on the chassis.

Figure 7-12 Stop Polling Screen

**Note**

When polling is taking place, a sheet with an arrow pointed up appears just above the network or object icon. Figure 7-13 shows the 2600a-Ethernet-1 and 2600a-Serial-8 in polling states.

Figure 7-13 Map Viewer Screen—2600a in Polling State



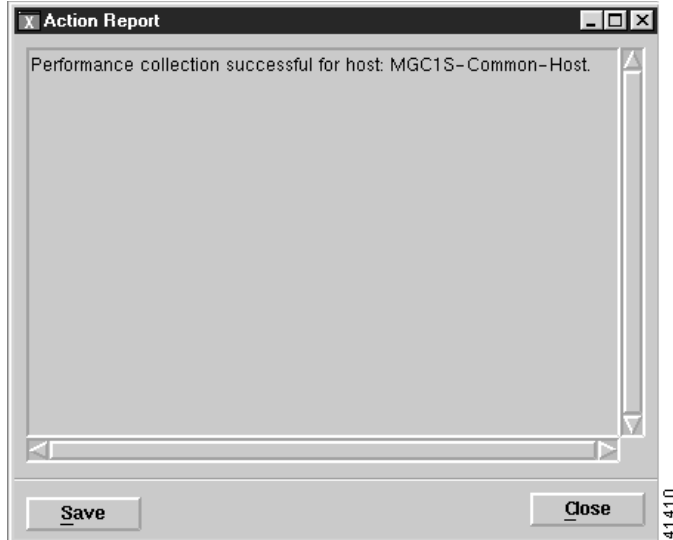
## Polling On Demand

While the active Cisco MGC host is being polled, you can also poll other devices on demand by clicking **Poll Now**.

## Action Report

An action report is presented when polling is complete, as shown in Figure 7-14.

Figure 7-14 Action Report Screen



## Decommissioning and Rediscovering Devices

You can commission or decommission devices such as the Cisco SLT, LAN switch, Cisco MGX 8260, BAMS, and Cisco MGC host. On the States screen, there are two buttons: one to decommission the device and the other to commission it. There is also a Rediscover button. See Figure 7-10.

Decommissioning a device prevents it from being presence polled or performance polled. A device in the decommissioned state still processes traps, but a presence poll alarm is cleared. Commissioning it brings it back on the network so that it starts presence polling.

Rediscover performs subrack discovery on the device and synchronizes all of the network interfaces and IP addresses.

## Viewing Performance Data

CMNM generates simple graphs of performance data (single counter, single object). These screens show the performance data in tabular, near real-time format for SS7, SS7 Link, SS7 Link Set, Voice Traffic, and Interface Utilization measurements. The performance counters associated with these measurements include, but are not limited to:

- Calls cancelled because of CCS congestion
- Number of transmitted IAM messages
- Received answer signaling
- Number of received IAM messages
- Number of transmitted CCS answer signals
- Number of attempts to transmit IAM messages
- Number of MSUs transmitted and received
- Duration of Level 1, 2, and 3 congestion



- Link availability

To view performance data, you need to select:

- Attributes for which performance data is to be displayed
- Time period over which the performance data is gathered
- Format to be used to display the results



**Note**

Before you can view performance data, you must first start performance monitoring on a device or network and wait until polling is complete.

**Step 1** Open the Performance Manager. The window shows the name of the selected object.

**Step 2** From the Monitored Attributes list, select the attribute to be monitored.



**Note**

You can select multiple attributes in a list by holding down the **Shift** key and selecting attributes in the list. You can select multiple individual attributes by holding down the **Ctrl** key and clicking individual items. The information for all selected attributes is shown in the Table Display. Only the first selected attribute is shown in the Line Chart or Bar Chart.

**Step 3** In the Start Date data entry boxes, enter the date the view of the performance statistics has to start from. The format is *mm/dd/yyyy*.

**Step 4** You set a start time and an end time using 24-hour notation. The times are inclusive. In the Start Time data entry boxes, enter the time the view of the performance statistics has to start on the Start Date.

**Step 5** To set the End Date you have two options:

In the End Date data entry boxes, enter the date the view of the performance statistics has to stop at. The format must be *mm/dd/yyyy* or select the **Now** check box to view the data from the selected start date to the current time. By selecting this option, you do not have to update the End Date and End Time fields.



**Note**

Now is the current time and remains current.

**Step 6** To set the End Time you have two options:

In the End Time data entry boxes, enter the time the view of the performance statistics has to stop on the End Date or select the **Now** check box to view the data from the selected start date to the current time. By selecting this option, you do not have to update the End Date and End Time fields.

**Step 7** From the Interval pull-down menu, select the summary interval to be used. This varies according to the attribute selected. The summary interval is the period of time over which the rule is applied. This pull-down menu always contains the option to select **raw**. This displays the data in raw format, which is performance data in its most detailed format (not summarized).



**Note**

When raw is selected, the Bar Chart view is not available and the Summary Rule option is grayed out.

**Step 8** From the Rule pull-down menu, select the summary rule to be used. This gives you the option to summarize data to a lower granularity as follows:

- Total—Totals all values gathered in the summary period
- Average—Takes the average of all values gathered in the summary period
- Min—Presents the lowest value received over the summary period
- Max—Presents the highest value received over the summary period
- LogicalOR—Displays either 1 or 0. This is typically used for status flags. Some attributes may have only two potential values (such as, true or false; yes or no; 1 or 0). When summaries are generated from values such as these, and the logical OR rule is used, the summarized value is 1 if any value in the summary interval is 1. If all values in the summary interval are 0, then the summarized value is 0.




---

**Note** The Summary Rule option is not available when the option to view raw data is selected.

---




---

**Note** The default summary rule is one day (24 hours).

---

**Step 9** Click **Refresh**.




---

**Note** The Refresh button is blue when it is available for selection. It is grayed out when not available. The Refresh button is available for selection when Now is selected, or when any criteria has changed and you have moved the cursor away from the changed value by clicking the **Tab** key or by using the mouse.

---




---

**Note** SNMP data (that is, data collected from the Cisco SLT and LAN switch) is refreshed in near real-time. When data is collected from the active Cisco MGC host, you can manually collect and display the current performance data by clicking **Refresh**. Refresh simply refreshes the Data view to display the latest data collected during polling. To update the data, you must start polling again.

---

By default, a line chart of the performance information, to date, is displayed. You can view performance information in the following formats:

- Line Chart, refer to Figure 7-15
- Table Display, refer to Figure 7-16

The performance information displayed corresponds to the attributes' raw values. If a summary period is selected, the information is displayed according to the Summary Rule. No summary period is associated with raw data.




---

**Note** In some circumstances, an object may fail to be polled. All missed polls are indicated on graphs and charts by yellow points that show the last valid value collected. A missed poll affects the summary data, and the data should not be relied upon.

---

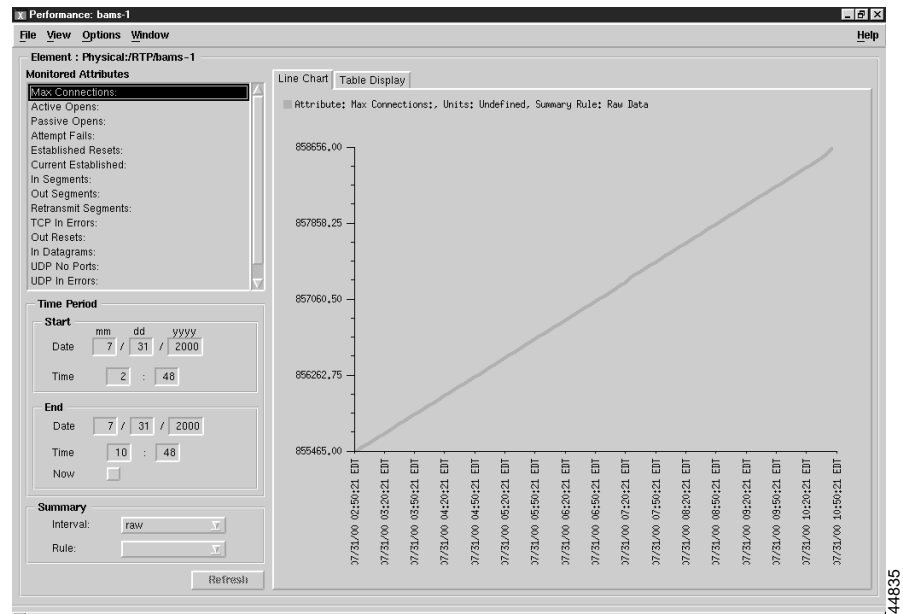
CMNM graphs and charts also indicate when an attribute started and stopped being polled due to history storage criteria being added, edited, or removed. Start and end polling events are shown in charts and tables:

- The start polling events point is shown in green.
- The end polling events point is shown in red.

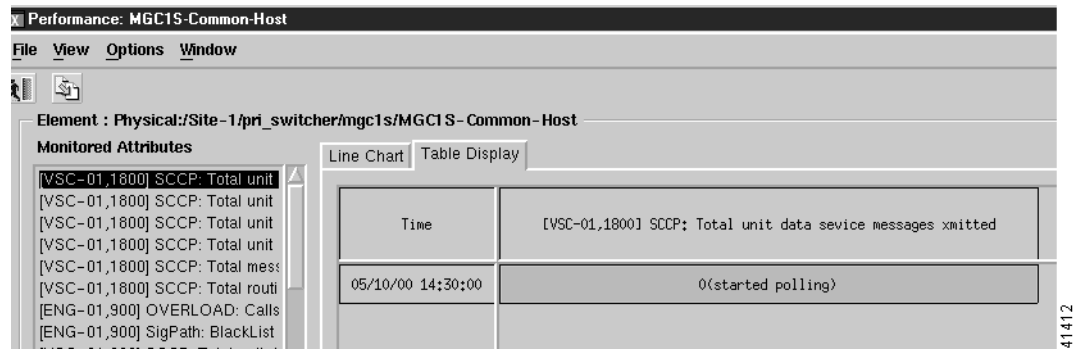


**Note** A Polling Events key is displayed.

*Figure 7-15 Sample Line Chart Screen*



*Figure 7-16 Sample Table Display Screen*



## Viewing Raw Data

You can view raw data as it is received without any summarization. History storage criteria define which attributes are to be monitored on specified objects. When these objects are polled, the retrieved data is stored by CEMF and can be viewed using the Performance Manager. This data is raw data. History storage criteria may also optionally specify summary intervals and rules to be applied to the raw data. The resultant data is summarized data.



**Note** The Summary Rule option and the Bar Chart view are not available when the option to view raw data is chosen.

- 
- Step 1** Launch the Performance Manager.
- Step 2** Choose the desired attributes and set the dates and times, as described in the “Viewing Performance Data” section on page 7-16.
- Step 3** From the Summary Interval pull-down menu, select **raw**.
- Step 4** Click **Refresh**.
- The new performance information displayed corresponds to the attributes value returned during the raw period.



**Note** The Refresh button is blue when it is available for selection. It is grayed out when not available. The Refresh button is available for selection when Now is selected or when any criteria has changed and you have moved the cursor away from the changed value by pressing the **Tab** key or by using the mouse.

---

## Viewing a Chart

You can zoom in, zoom out, and move around the displayed charts by using the keys and mouse buttons described in Table 7-6. Note that you must select a chart before invoking these actions.

*Table 7-6 Chart Viewing Actions*

Press	Action
Shift and left mouse button	To select multiple attributes in a list.
Up arrow key	Scrolls up the Table display.
Down arrow key	Scrolls down the Table display.
Left mouse button	Clicking and dragging with the left mouse button over an area zooms in on that section of the chart. You cannot zoom in on a chart that has a scroll bar.
Middle mouse button	Takes the view back one zoom level after zooming in using the left mouse button.

## Viewing Points and Values on a Line Chart

You can choose to annotate a line chart with color-coded points that represent the polling status. You can also show the values associated with each point.

- 
- Step 1** From the View menu, select **Points**. This annotates the line chart with points, which visually indicate the points that are presented in tabular form in the Table Display. A point is colored-coded to show polling status as follows:
- Black—Poll
  - Red—Stopped polling
  - Green—Started polling
  - Yellow—Missed poll

- Step 2** From the View menu, select **Values**. This option shows the values associated with each point, which are presented in tabular form in the Table Display.

The values are shown on each chart until the item is deselected in the View menu.

---

## Viewing a Performance Log

Performance data is saved in a log. To view data from past pollings:

- 
- Step 1** Using the instructions in the “Viewing Performance Data” section on page 7-16, select the following to define the data you want to view:
- Start time and date
  - End time and date (select **Now** for current data)
  - Summary interval
  - Summary rule
- Step 2** Click **Refresh**.
- 

## Setting How Performance Data Is Archived

CMNM allows you to specify how long performance data should be kept in the database. You can also specify roll-up rules and other actions that should be taken on performance data after a set length of time.

CEMF manages a database of performance data values, and ensures the database does not grow indefinitely. This is achieved by purging data that is deemed to be old. Several rules are used to determine what data should be purged based on the concept of samples. A sample is either a collection of raw data, or a collection of data that has been summarized using one summary rule for one summary interval.

The attributeHistoryServer.ini file, described in Table 7-7, controls the behavior of the performance purging mechanism:

```
minValueCount = 50
maxValueCount = 1000
minRawDataAge = 60
```

*Table 7-7 attributeHistoryServer.ini file Attributes*

Parameter	Description
minValueCount	Specifies the minimum number of values to be kept for each sample. Data is never removed from a sample if doing so would result in that sample having fewer than this number of values. This value is set to 50 on a standard CEMF installation.
minRawDataAge	Specifies the minimum age of raw data (in seconds) that must be kept. Raw data younger than this age is never removed. This value is set to 60 on a standard CEMF installation. For example, if the system has just received 100 changes to an attribute in the 40 seconds preceding a purge, then the last 100 values would be kept and not just the last 50.
maxValueCount	Specifies the maximum number of values to be kept for each sample. Whenever this number of values is reached for a sample, values are removed until either of the first two settings would be breached if any more were removed. This value is set to 1000 on a standard CEMF installation.

In some cases, these three settings may conflict with history-storage-criteria summary intervals. For example, if the history storage criteria specifies that only daily summaries are to be generated, but the purging criteria specify that one full day's worth of raw data is never available, then the daily summaries could not be generated if the purge settings were followed. In such cases, data is not purged until summaries that depend on that data have been generated.

These values can be modified using the historyAdmin utility. However these values have a significant effect on database size and performance. As such, care must be taken when changing these parameters, because the settings have a direct association with overall disk requirements.



**Note**

For information on configuring how alarms are stored and deleted, see the "Setting How Long Alarms Are Stored" section on page 8-41.

## Printing a Performance File

You can print performance statistics from the Performance Manager, either as a chart or as a table. A chart prints out the information that can be seen in the window. A table prints out all of the performance statistics in a plain text format.

The output is printed by the default printer setup on your network.

- 
- Step 1** Open the Performance Manager and select the desired performance statistics.
- Step 2** From the **File** menu, select **Print**. Choose either **As Chart** or **As Table**.
-