



Performance Management and Historical Data

An important component of efficient network management is the ability to collect and analyze performance information in a large network of many devices. This performance information can assist you to pro-actively manage your network elements, and troubleshoot network problems.

This chapter describes the Cisco Element Management Framework (Cisco EMF) Performance Manager application that is used in conjunction with the Cisco 12000 Manager (C12kM) application to view performance statistics from the Cisco 12000 series internet routers managed on your network.

Performance Manager collects historical performance data for interfaces. You can only view performance information in Performance Manager if performance logging is switched on. Performance Manager is a powerful, flexible tool that enables you to view general and performance specific attributes in one application and in a variety of formats (for example, graphs and tables). You define the attributes or parameters, choose the objects you want to view, select the date and time of the view, and set the summary interval.

Performance logging can be switched on/off globally (that is, for all modules and interfaces below these modules) from the Chassis Configuration window. Refer to the [“Starting Global Performance Logging” section on page 4-9](#) or [“Stopping Global Performance Logging” section on page 4-10](#) for further details.

Module performance logging can be switched on/off on a per module basis from the Module Performance window. Switching performance logging on for a selected module also switched performance logging on for the interfaces and VLAN sub-interfaces on the module. Refer to the [“Starting or Stopping Performance Logging” section on page 5-10](#) for further details.

VLAN sub-interfaces or interface performance logging can be switched on/off on a per interface basis from the Generic Interface Performance window. Refer to [“Starting Performance Logging for a Selected Interface” section on page 10-5](#) for further details.

Performance Manager collects data for all different technologies on an interface. For example, if you want to view Performance Manager data for an ATM interface, performance attributes are listed for Generic and SONET technologies, because both apply to ATM interfaces.

Performance information in Cisco 12000 Manager (C12kM) application can be viewed in two ways:

1. Using Performance Manager to display historical data as well as current data in the form of a line chart, bar chart, or table.
2. Using the Interface Performance windows option to view current data in a raw numerical format. Refer to [Chapter 10, “Interface Performance,”](#) for further information.

This chapter describes the Performance Manager application and the various historical performance statistics available on the various objects within the C12kM.

**Note**

Further information on Performance Manager is available in the *Cisco Element Management Framework User Guide Release 3.2 (78-12536-01)*, when required.

Performance Information Available Using C12kM

C12kM collects a variety of performance information. The performance information collected can be viewed “real time” (as it happens), on a number of Interface Performance windows (see [Chapter 10, “Interface Performance,”](#)) or as historical information using Performance Manager.

[Table 16-1](#) summarizes the performance attributes that can be monitored for a GRP module and then viewed using the Performance Manager application.

Table 16-1 Monitored Attributes for a GRP Module

Monitored Attribute	Description
CPU% performance	Displays the percentage of the CPU performance for the selected module.
CPU performance averaged over 1 minutes	Displays the percentage of the CPU utilized for the selected module, averaged over a one minute period.
CPU performance averaged over 5 minute	Displays the percentage of the CPU utilized for the selected module, averaged over a five minute period.

Viewing the Performance Manager Window

To view the Performance Manager window, proceed as follows:

- Step 1** Right click (on a relevant object icon in the Map Viewer window or from an object pick list) and select the **Tools>Performance Manager...** option. Refer to [Table 16-2 on page 16-2](#) for information on which objects allow you to launch the Performance Manager window. The Performance Manager window appears, with the Line Chart tab displayed:

Table 16-2 Accessing Performance Manager

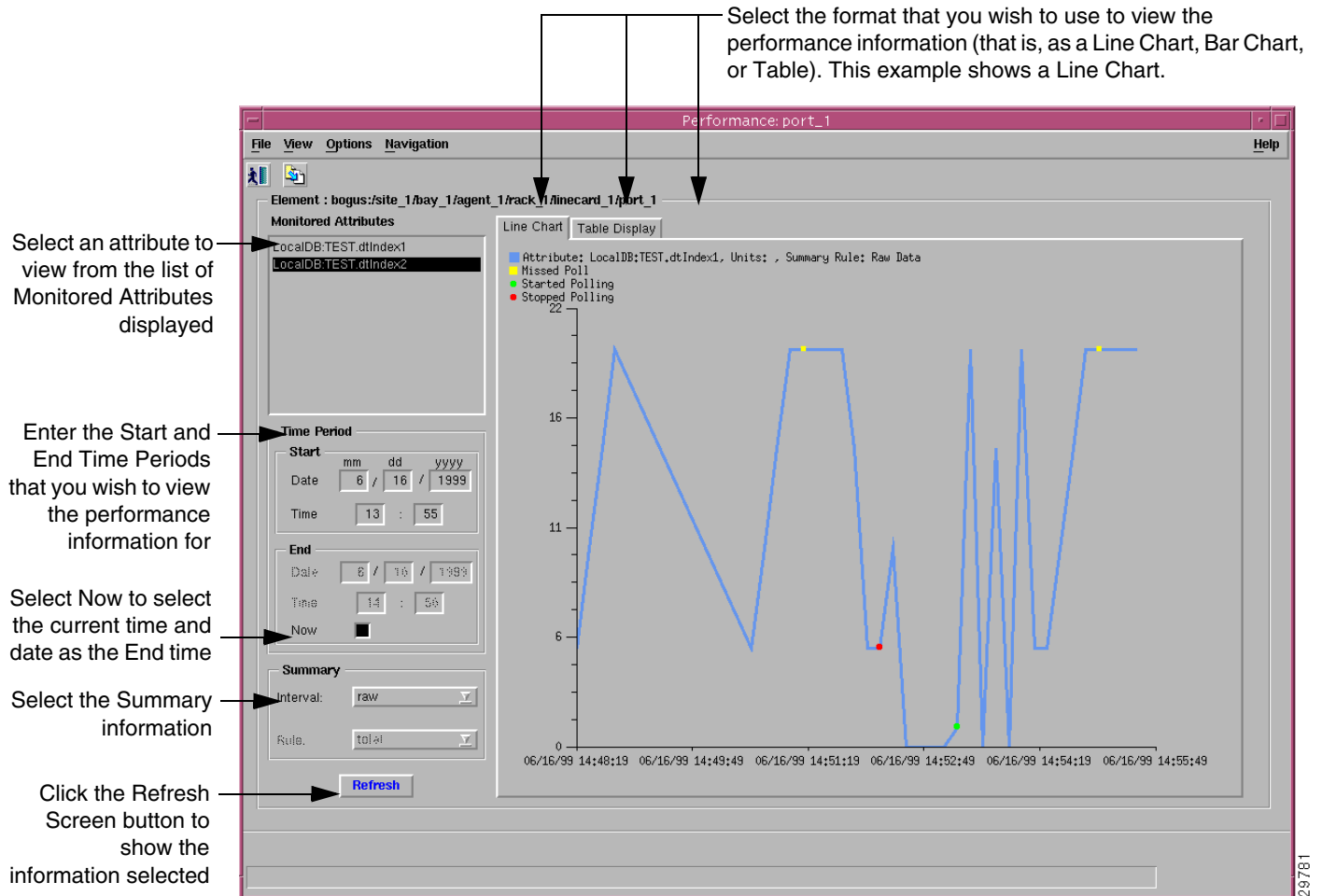
Objects (that can be selected) to Open the Performance Manager Window					Menu Options to Select to Open Window
Site	Shelf	Chassis	Module	Interface	
No	No	Yes	Yes	Yes	Tools>Performance Manager

**Note**

The Performance Manager window cannot be opened when multiple objects are selected (the menu options to open the C12kM windows are grayed out). Available menu options can be launched from a site object containing the required objects, when required.

The Performance Manager window appears (see [Figure 16-1](#)).

Figure 16-1 Performance Manager Window



The Performance Manager window allows you to:

- Identify all Monitored Attributes on a selected managed object. Refer to [“Performance Information Available Using C12kM”](#) section on page 16-2 for details.
- 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 (as a Line Chart, Bar Chart or as a Table Display)
- Print performance data to a printer
- Save/export performance data to a file, for subsequent analysis and processing, for example, using a spreadsheet application.

Step 2 Proceed to the [“Viewing Performance Statistics”](#) section on page 16-4 for details on viewing performance statistics.

**Note**

Cisco EMF provides a command line utility (history Admin) that allows mass export of performance history data. Refer to the *Cisco Element Management Framework User Guide Release 3.2 (78-12536-01)* for further information.

Viewing Performance Statistics

To view performance statistics, follow these steps:

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- Step 1** Open Performance Manager. Refer to the “[Viewing the Performance Manager Window](#)” section on [page 16-2](#) for further details.
- Step 2** Choose the attribute you wish to monitor in the Monitored Attributes panel (for details on this panel, refer to the “[Performance Manager Window—Detailed Description](#)” section on [page 16-7](#)). You can choose multiple attributes in a list by holding down the Shift key and then selecting the first and last attributes in the list. You can choose multiple individual attributes by holding down the Ctrl key and clicking on individual items.
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- Step 3** Set the start Date and Time in the Time Period area. Enter the date on which you want to begin viewing performance data in the Start Date entry boxes. The format must be mm/dd/yyyy. Enter the time you want the performance data to start on in the Start Time data entry boxes. Set a start time and an end time using the 24 hour clock notation. The times are inclusive.
- Step 4** Set the End date. You have two options when setting the end date. Enter the date on which you want to stop viewing performance data in the End Date entry boxes. The format must be mm/dd/yyyy. Or, check 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 time fields.
- Step 5** Set the end time in the Time Period area. You have two options when setting the end time. Enter the end time at which you wish to stop viewing performance data in the End Time entry fields. The format must be mm/dd/yyyy. Or, check 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 time fields.
- Step 6** Choose the summary interval from the drop down list in the Summary area. The summary interval is the period of time over which the rule is applied. This varies according to the attribute selected. You can choose the Raw option, which displays performance data in its most detailed format, not summarized.

**Note**

The performance information corresponds to the attributes’ raw values. If you choose a summary period, the information is displayed according to the summary rule. No summary period is associated with raw data.

**Note**

When you choose Raw, the bar chart view is sometimes not available, and the Summary Rule option is grayed out.

Step 7 Click **Refresh Screen**. The Refresh Screen button is grayed out when not available. The Refresh Screen 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.

The performance information appears as a line chart by default. You can view performance information as a Line Chart, a Bar Chart (except when the raw option is selected from the Interval drop down list) or as a Table Display by selecting the corresponding tab.

The performance information corresponds to the attributes' value returned during the raw sampling period. When a summary period other than raw is selected, the information appears according to the summary rule.



Note In some circumstances (possibly due to C12kM being shut down or a heavy network load), polls can be missed. Performance Manager deals with this problem by displaying missed polls in red. The missed poll value is replaced by the last valid value collected. 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. Start and stop polling events are shown in charts and tables. The start polling events point is shown in green, and the stop polling events point is shown in red.

A polling events key is displayed for selection.

Viewing a Chart

You can zoom in, zoom out and move around the displayed charts using the key presses detailed in [Table 16-3](#). You must first select the chart before using the key presses detailed in [Table 16-3](#).

Table 16-3 Table of Key Presses

Press	Action
Right arrow key	Moves the chart one unit to the right
Left arrow key	Moves the chart one unit to the left
Up arrow key	Moves the chart to the bottom
Down arrow key	Moves the chart to the top
Shift and Z key	Zooms in on the chart's x axis
Shift and U key	Zooms out on the chart's x axis
Z key	Zooms in on the chart's y axis
U key	Zooms out on the chart's y axis
Shift and F key	Fits all information on the x axis in window
F key	Fits all information on the y axis in window

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 which can be seen in the window, and a table prints out all of the performance statistics in a plain text format.

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

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- Step 1** Open the Performance Manager and select the desired performance statistics.
 - Step 2** From the **File** menu, select **Print**.
 - Step 3** Choose **As Chart** or **As Table**.
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Saving Performance Data to a File

Performance data is stored in the Cisco EMF database. It is not exported to ASCII file by default. To save performance data, follow these steps:

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- Step 1** Open the Performance Manager and view the performance statistics you want to save.
 - Step 2** From the **File** menu, select **Export to File**
or
click the **Save As** icon  on the Toolbar.
 - Step 3** The File Chooser window appears. The left hand panel displays the directories and the right hand panel displays the files. Use the scroll bars to locate the desired file. Click **Filter** to expand the list of options.
 - Step 4** Choose the file. The full path name of the selected file is displayed in the File Filter box, as well as the Choice box.



Note You can save the data to a new location or to a new file. Type in the new names as required in the Choice boxes.

- Step 5** Click **Apply** to save the file or **Cancel** to return to the Performance Manager window.
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Archiving

Collected data is archived each day. The applied file name is generated automatically using the format mm-dd-yyyy.log. When entries are archived, they are purged from the database. By default, only raw data is archived.



Note If more than one purge is carried out in a day, the original log file is overwritten and the information stored is lost. After a purge, only the information in the current sample period is available for display.


**Note**

Cisco EMF contains a utility called historyAdmin. HistoryAdmin enables you to selectively export performance data for groups in an automated manner.

Refer to the *Cisco Element Management Framework User Guide Release 3.2 (78-12536-01)* for further details.

Exporting A Performance File

Performance data can be exported for use in other applications. To export performance data, follow these steps:

- Step 1** Open the Performance Manager and view the performance statistics you want to export.
- Step 2** From the **File** menu, select **Export to File**
or
click the **Save As** icon  on the Toolbar.
- Step 3** The File Chooser window appears. The left hand panel displays the directories and the right hand panel displays the files. Use the scroll bars to locate the desired file. Click **Filter** to expand the list of options.
- Step 4** Choose the file. The full path name of the selected file is displayed in the File Filter box, as well as the Choice box.

**Note**

You can save the data to a new location or to a new file. Type in the new names as required in the Choice boxes.

- Step 5** Click **Apply** to save the file or **Cancel** to return to the Performance Manager window.

Performance Manager Window—Detailed Description

The Performance Manager window displays three areas: Monitored Attributes, Time Period, and Summary. The Performance Manager window also displays three tabs: Line Chart, Bar Chart, and Table Display.

Monitored Attributes

The monitored attributes list at the left of the window allows you to select the specific attribute you wish to view performance information for. The fields in this list change, depending upon the type of interface that you launched Performance Manager from. For example, if your selected interface is was an ATM line card, you will be able to select all the performance fields that can be found on the following performance windows: SONET Performance, and Generic Performance. Both of these technologies apply to ATM line cards, therefore all performance information for both technologies is listed in the Performance Manager. This list is extensive.

Time Period

The Time Period area contains two sub-areas: Start and End.

Start

The Start area displays two fields: Date and Time.

Date—Enter the date on which you want to begin viewing performance data. The format must be mm/dd/yyyy.

Time—Enter the time you want the performance data to start. Set a Start time using the 24 hour clock notation.

End

The End area displays three fields: Date, Time and Now.

Date—Enter the date on which you want to stop viewing performance data. The format must be mm/dd/yyyy.

Time—Enter the time you want the performance data to stop. Set an End time using the 24 hour clock notation.

Now—Choose 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 time fields.

Summary

The Summary area displays two drop down boxes: Interval and Rule.

Interval—Choose the summary interval from the drop down list in the Summary area. The summary interval is the period of time over which the Rule is applied. This varies according to the attribute selected. You can choose the Raw option, which displays performance data in its most detailed format, not summarized.



Note The performance information corresponds to the attributes' raw values. If you choose a summary period, the information is displayed according to the summary rule. No summary period is associated with raw data. When you choose Raw, the bar chart view is sometimes not available, and the Summary Rule option is grayed out.

Step 6 **Rule**—From the drop down list, choose the **Rule** to be used. This gives you the option to view data summarized according to various rules as defined by the history storage criteria as follows:

- **Total**—totals all values gathered in the summary period
- **Average**—takes the average of all values gathered in the summary period
- **Trough**—presents the lowest value received over the summary period
- **Peak**—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 logicalOR 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 **Rule** option is not available when the option to view raw data is chosen.

Refresh

Refresh—The **Refresh** button is blue when it is available. 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.

Line Chart Tab

The Line Chart tab displays the retrieved data in a graphical format. The X-axis displays the time at which the polling was done, and the Y-axis displays the value retrieved or the value when the equipment did not respond properly.

Further information regarding the element, units, and missed polls is provided, using the appropriate color coding displayed at the top of the chart. Blue represents the values retrieved and red identifies any polled values missed.

Bar Chart Tab

The information on this tab is shown as a bar chart with the retrieved data. Blue represents the values retrieved and red identifies any polled values missed.

Table Display Tab

The Table tab displays the data retrieved in a tabular format. The first column shows the time of polling, and the second column shows the retrieved values. Blue represents the values retrieved and red identifies any polled values missed.

