NORTEL NETWORKS

Preside Multiservice Data Manager

Performance Management

User Guide

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Performance Management

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Contents

About this document

The following topics are discussed in this section:

Who should read this document and why

This document is for those who require performance metrics for devices in the Preside MDM network. This document describes the Performance management tools and how to use them.

What you need to know

This document assumes that you have an understanding of

- network management
- the elements in your network including the Passport product
- the UNIX operating system

How this document is organized

This document contains the following sections:

- "Performance management overview" (page 15) gives a description of the performance management tools and how to access them.

- "Data Viewer" (page 19) describes the Data Viewer tool for collecting and displaying performance information about Simple Network Management Protocol (SNMP) and Passport devices and components. This section also provides procedures for using this tool.
- "DPN Performance Viewer" (page 115) describes the DPN Performance Viewer tool for collecting and displaying performance information about Passport and DPN components and provides procedures for using this tool.
- "Passport performance metrics" (page 139) provides a list of metrics supported by the Data Viewer application.
- "DPN-100 metrics" (page 265) provides a list of metrics supported by the Data Viewer application.
- "Metric file format" (page 271) provides a description of the SNMP metric file format and elements.

What's new in this document

The following changes were made to this document:

- "Enhancements" (page 12)

Enhancements

The following enhancements have been made to the Data Viewer tool:

- new metrics for this release
- minor corrections

Text conventions

This document uses the following text conventions:

- `nonproportional spaced plain type`

  Nonproportional spaced plain type represents system generated text or text that appears on your screen.

- **nonproportional spaced bold type**

  Nonproportional spaced bold type represents words that you should type or that you should select on the screen.

- *italics*

  Statements that appear in italics in a procedure explain the results of a particular step and appear immediately following the step.

  Words that appear in italics in text are for naming.

- [optional_parameter]

  Words in square brackets represent optional parameters. The command can be entered with or without the words in the square brackets.

- <general_term>

  Words in angle brackets represent variables which are to be replaced with specific values.

- UPPERCASE,lowercase

  Uppercase and lowercase letters that appear in UNIX commands and parameters must be matched exactly. The system matches upper and lowercase characters differently.

- UPPERCASE,lowercase

  Passport commands are not case-sensitive and do not have to match commands and parameters exactly as shown in this document, with the exception of string options values (for example, file and directory names) and string attribute values.

- ->

  A right-pointing arrow in a procedure indicates that a menu item has submenus from which you must choose. The appropriate submenu selection is shown immediately after the arrow.

- |

  This symbol separates items from which you may select one; for example, ON|OFF indicates that you may specify ON or OFF. If you do not make a choice, a default ON is assumed.

- ...

  Three dots in a command indicate that the parameter may be repeated more than once in succession.

The term absolute pathname refers to the full specification of a path starting from the root directory. Absolute pathnames always begin with the slash (/) symbol. A relative pathname takes the current directory as its starting point, and starts with any alphanumeric character (other than /).

Related documents

See the following documents for related information:

- 241-6001-011 *Preside MDM Fault Management User Guide*

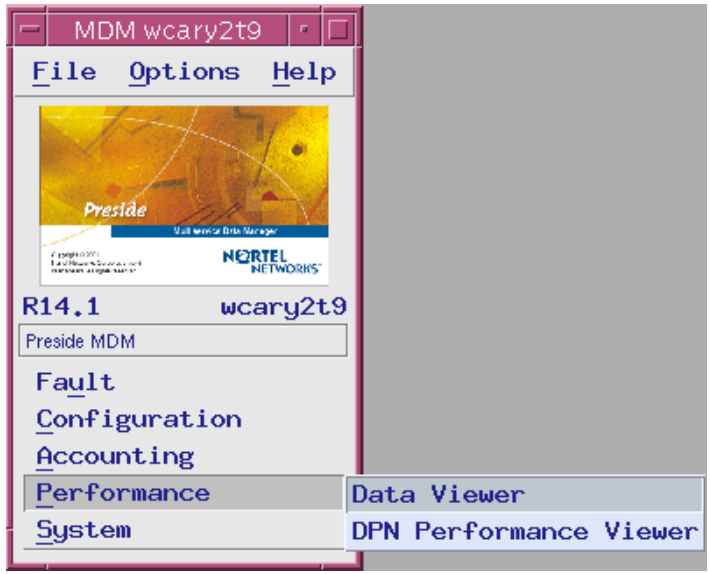
Chapter 1
Performance management overview

Performance management

The Preside Multiservice Data Manager (MDM) tools for accessing performance are available from the Performance toolset in the Preside MDM window.

The figure “Preside MDM performance management tools” (page 16) shows the selection of performance management tools.

Figure 1
Preside MDM performance management tools



The following list provides a brief description of the performance management tools:

- Data Viewer
  Data Viewer monitors performance metrics of components associated with (Simple Network Management Protocol (SNMP) and Passport devices using a graphical interface, traces faults in the network, collects information about network load, and generates statistics for reporting analytical purposes. For details, see “Data Viewer” (page 19).
- DPN Performance Viewer
  DPN Performance Viewer monitors performance metrics of components associated with DPN devices using a graphical interface, traces faults in the network, collects information about network load, and generates statistics for reporting analytical purposes. For details, see “DPN Performance Viewer” (page 115).

Accessing performance management tools

Access performance management tools from the Preside MDM window or the Start Tool menu from within a Preside Multiservice Data Manager (MDM) fault tool.

1 Start the performance management tool by one of the following methods:

- In the Preside MDM window, select Performance and then the tool name that you want to use. For example, to start the Data Viewer tool, select **Performance** -> **Data Viewer**.
- From a fault management tool, open the Start Tools menu. (For details, see the tool's documentation.) From the pop-up menu that opens, select Start Tool and then the tool name that you want to use. For example, to start the Data Viewer, select **Start Tool** -> **Performance** -> **Data Viewer**.
- From the command line by typing **/opt/MagellanNMS/bin/dataviewer -mode <REALTIME|REPLAY>**. **REALTIME** launches the Data Viewer in real-time mode. **REPLAY** launches the Data Viewer in replay mode. The default is real-time mode.

The selected performance management tool opens.

Chapter 2
Data Viewer

This section describes the Data Viewer tool. The following information is contained in this section:

Note: For information on using the Data Viewer tool, see "Data Viewer procedures" (page 57)

Data Viewer overview

The Data Viewer tool is a Preside Multiservice Data Manager (MDM) diagnostic tool that lets you collect, display and analyze performance information in real-time mode and replay mode.

The Data Viewer supports the following views:

- spreadsheet view
- record view
- component view
  This view supports all device types in real-time mode. In replay mode, this view supports Statistical Retrieval System (SRS), Streamed Passport Statistics (PMSP), Data Viewer Saved Statistics, and Management Data Provider statistics.

- latest poll view (real-time mode only)

  Note 1: The Performance Measurement Stream Processor (PMSP) server is used only in a Succession Network solution.

  Note 2: See "Data panel area" (page 37).

This section includes information specific to real-time mode, replay mode, and to both modes. See the following sections for more information:

- "Applicable to real time mode" (page 20).
  See "Menu bar" (page 23) for more information on the menu items specific to real time mode.
- "Applicable to replay mode" (page 32).
  See "Menu bar" (page 23) for more information on the menu items specific to replay mode.
- "Applicable to real-time and replay modes" (page 37).

Applicable to real time mode

Note: This section applies to real-time mode. See the following sections: "Applicable to replay mode" (page 32), and "Applicable to real-time and replay modes" (page 37).

Data from Passport and Simple Network Management Protocol (SNMP) devices is collected in real-time mode. You can use the Data Viewer to do the following tasks:

- help trace faults in the network
- collect information about network load
- generate statistics for reporting and analytical purposes

The Data Viewer collects attributes for Passport and SNMP devices and uses the attributes to derive more meaningful metric values. The Data Viewer also supports 64-bit counters for Passport and SNMP devices.

Passport network components use the Generic Prober (GP) server to collect performance information. This tool also provides a metric file that contains a list of available metrics for each Passport and SNMP component. A metric

file is a text file that is written in XML format. The contents of a metric file depends on the SNMP or Passport device type to which the file applies. One metric file is required for each SNMP or Passport device type.

The metric names appear in the Data Viewer window when you select a component to monitor. You can choose the metrics to display for each component, during each polling session. The metric values display in both tabular and graphical formats. You can also add metrics and components to the metric file as required.

You can customize the metric files by adding metrics and components as required. To customize a metric file, use a standard UNIX text editor. You must follow the format in the file and provide accurate and complete information. For information on the elements of a metric file and the format in which they must be used, see "Metric file format" (page 271).

This section contains the following information on real-time mode:

- "Data Viewer window for real-time mode" (page 21)
- "Authenticate dialog" (page 30)
- "Working with Data Viewer Saved Statistics files" (page 31)

Data Viewer window for real-time mode

The Data Viewer window for real-time mode is described in this section. This section contains the following areas:

- "Menu bar" (page 23)
- "Polling criteria area" (page 26)
- "Metric selection area" (page 28)
- "Command buttons" (page 29)
- "Status line" (page 30)
- "Graph button" (page 30)

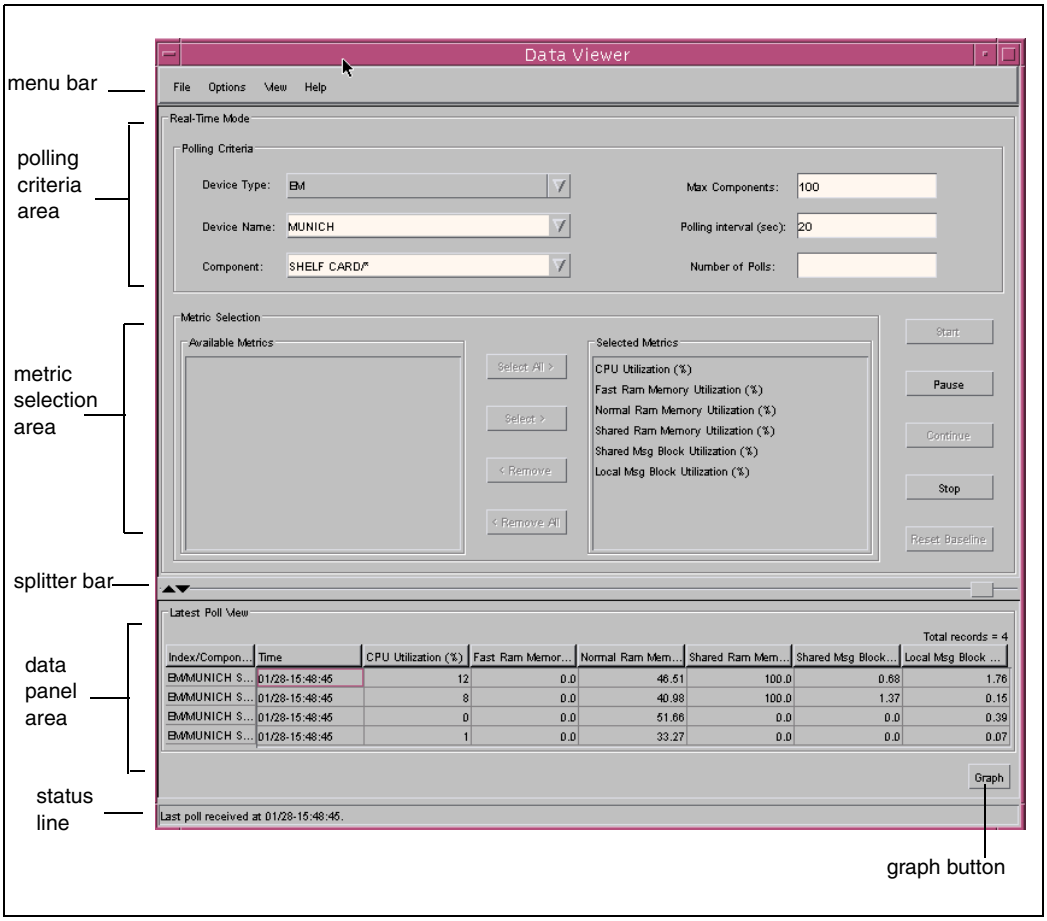
The figure "Data Viewer window - Real-time mode in latest poll view" (page 23) shows a sample display of the **Data Viewer** default window in real-time mode.

A splitter bar between the metric selection area and the data panel area divides the **Data Viewer** window into two adjustable window panes. You can adjust the window panes to hide or show each area or to have one area fill the entire Data Viewer display. To change the relative size of each window pane, click and drag the mouse over one of the window pane movement arrows.

When you first attempt to establish a connection to a network component, there is a delay until a response is received from the server. During this delay, the status line at the bottom of the Data Viewer window displays the status of the connection.

From the **Data Viewer** window, you can launch the **Graph** window to view details of the data collected for each component. See “Authenticate dialog” (page 30).

Figure 2
Data Viewer window - Real-time mode in latest poll view



Menu bar

The menu bar commands let you use the Data Viewer and view its performance information. The menu bar contains the following menus:

- “File menu” (page 35)
- “Options menu” (page 35)
- “View menu” (page 35)

- "Help menu" (page 36)

File menu

The **File** menu contains the following commands:

- **Connect To Server** connects to the server to start a polling session. A message in the Status line informs you of the connection status.
- **Start Recording** lets you write statistical data, including baseline-delta statistics, to the Data Viewer Saved Statistics file. This command has the following options:
  - — **Record All Available Data** writes to the Data Viewer Saved Statistics file all the metric data that the Data Viewer has collected since start-up.
  - — **Record Starting Now** writes the metric data that the Data Viewer collects during the next and subsequent polling intervals.

You can choose to overwrite an existing Data Viewer Saved Statistics file or start a new file with a new name. The file is placed in your home directory, unless you provide an absolute pathname.

The Data Viewer Saved Statistics file is updated every time data is received. Updates stop when you select the **Stop Recording** command or exit the Data Viewer.

The null value makes a break point on the graph to make a pause and resume more visible. In the data record file, the null values appear as empty between the delimiter. All baseline values are reset to the value collected from the first poll taken after you click Continue.

- **Stop Recording** stops output to the Data Viewer Saved Statistics file and saves and closes the file.
- **View Recording** displays the **View File** window to let you select a file to view. You can also view baseline-delta statistics. If you select the file that is currently open, new data are written to the file as they are received.

  The **File** menu of the **View File** window has the following options:

  - — **Load File** opens the selected Data Viewer Saved Statistics file and writes it to the screen.

— **Exit** closes the Data Viewer Saved Statistics file.

- **Exit** terminates the polling session and closes all Data Viewer windows.

  Note: These commands, except **Exit**, are disabled in Replay mode.

Options menu

The **Options** menu contains the following commands:

- **Replay Mode** lets you replay collected data. When this option is selected, Replay Mode is disabled.
- **Load MIBs** launches a dialog that lets you select the Management Information Base (MIB) file to load. A MIB file maps each Simple Network Management Protocol (SNMP) device type to its object ID (OID). If the MIB file for a device type is specified in the resource file, the MIB file loads automatically when you click **Start** in the Data Viewer window. If not, the Load MIBs dialog prompts you to select the MIB file to load.
- **Unload MIBs** unloads the MIB files that are currently loaded. You must unload the current MIB file when you change the device type during a polling session.

  Note: The **Load MIBs** and **Unload MIBS** commands are enabled only if Data Viewer is configured to collect performance data on Simple Network Management Protocol (SNMP) devices, and when you select the SNMP device as the **Device Type** in the **Polling Criteria** area.

View menu

The **View** menu contains a list of data views. The view you select is displayed in the data panel area. You can only select one view at a time. When a view is selected, its menu option is disabled. The **View** menu contains the following commands:

- **Spreadsheet View** sets the data displayed in the data panel area to Spreadsheet View.
- **Record View** sets the data displayed in the data panel area to **Record View**.
- **Component View sets the data displayed in the data panel area to Component View.**

- **Latest Poll View** sets the data displayed in the data panel area to **Latest Poll View**.

  Note: The views are described in the section, "Data panel area" (page 37).

Help menu

The **Help** menu contains the following commands:

- **Help On Context** contains help information on a specific object in the window. When you select this command, the cursor changes to a question mark. You can then place it anywhere on the window, click and online help is displayed.
- **Help On Window** provides descriptive help information about a window.
- **About Data Viewer** shows you the release of Data Viewer.

Polling criteria area

The polling criteria area in the Data Viewer window lets you specify the device and associated component(s) for which to gather information, and the polling interval.

The polling criteria area contains three fields:

- **Device Type** lets you specify the device type to monitor.
  When there is only one device type in the list, this device is selected automatically when Data Viewer starts in Real-time mode, or when switched from Replay mode to Real-time mode.
- **Device Name** consists of a list of device names when you select the device type. You can enter the device name or select an item from the menu. If the device type for Passport is selected, the **Authenticate** dialog then prompts you for the group, username and password. See "Authenticate dialog" (page 30).

- **Component** lets you specify the component(s) to monitor. The **Component** field contains a list of the component types that are defined in the metric file for a Passport family. You can select one or more components to monitor.

  To select a component, you can click an item in the list or type the component name in the **Component Name** field. If there are multiple instances of a component, a forward slash appears after the component name. In this case, you must enter the instance of the component you want to monitor. The instance must appear immediately after the forward slash.

  To select multiple components, you can enter one of the following after the forward slash:

  — the wild-card "*" to poll all instances of the component

  — if the component instances are sequential, the first and last number in the range, separated by dots (for example, to select instances 2, 3, 4, and 5, type SHELF CARD/0..5)

  — the number of each component instance to be polled. Use a semi-colon to separate each component instance from the next (for example, SHELF CARD/2;4;5).

For guidelines on selecting multiple components, see "Collecting performance information for multiple components for SNMP devices" (page 63).

Multiple component instances are only allowed for the lowest component type (for example, LP/* E1/1...10 and LP/* E1/1;5;7 are not supported)

- **Max Components** lets you specify the maximum number of components to monitor. The default value for this field is 100. Network traffic is impacted if the maximum component number is too large. You must enter a number in this field when you select multiple components using either the wildcard (*) or a range of component numbers.

  No **Max Component** value is necessary if you select a single component instance, or multiple component instance with a semi colon as the separator. If the **Max Component** value is specified, it will not have any impact on the number of components returned.

- **Polling interval (Secs)** lets you specify the polling interval (in seconds) for data collection. The polling interval has a range of 10 seconds to 600 seconds for Simple Network Management Protocol (SNMP) devices. The default value is 60 seconds. For Passport devices, the polling interval has a range of 30 seconds to 600 seconds. The default is 60 seconds. If the polling interval is not within the range, the **Information** dialog opens and displays the acceptable range.

  Note: The polling interval is a target value; depending on network speed, some data collection may take longer. The polling interval also impacts the traffic of the network. A small polling interval can flood the network with too much traffic and impact network performance. The Passport polling interval of less than 30 seconds is not recommended.

  Follow the recommendation below when deciding what polling interval to use and how many attributes to poll to facilitate optimum network performance:

  — number of metrics X number of components / polling interval in seconds < 1.7

- **Number of Polls** lets you specify the number of polls to execute during the polling session. If you enter a number in the **Count** field, polling stops when this number is reached. If you do not enter a value, polling continues until you exit the tool, pause or stop the polling, or start monitoring another component.

Metric selection area

The **Metric Selection** area in the Data Viewer window lets you specify the metrics to poll. This area contains the following fields and buttons:

- **Available Metrics** lists the metrics that are defined for the component but are not selected for polling. You can select any or all of the metrics from this list for polling. You can also right-click a metric to display a description of the metric.
- **Selected Metrics** lists the metrics that are selected for polling. You can remove any metric from this list by clicking the metric name, and then clicking the left arrow. You can also right-click a metric to display a description of the metric.

- **Select All** lets you select all the available metrics to be polled. This option is grayed out if there are no metrics in the **Available Metrics** section.You can click **Select All** when you select one or more metrics. The metrics are moved from the **Available Metrics** list to the **Selected Metrics** list.
- **Select** lets you select a specific metric to be polled. This option is grayed out if no metrics are selected in the **Available Metrics** section. You can click **Select** when you select one or more metrics. The metric is moved from the **Available Metrics** list to the **Selected Metrics** list.
- **Remove** lets you remove a specific metric to be polled. The Remove option is grayed out if no metrics are selected from the **Available Metrics** section. You can click **Remove** when you select one or more metrics. The metric is moved from the **Selected Metrics** list to the **Available Metrics** list.
- **Remove All** lets you remove all metrics to be polled. This option is grayed out if there are no metrics in the **Selected Metrics** section. You can click **Remove All** when you select one or more metrics. The metrics are moved from the **Selected Metrics** list to the **Available Metrics** list.

  Note: Use Shift + click to select a block of metrics. Use Ctrl + click to select more than one metric.

Command buttons

The command buttons in the Data Viewer window let you control the polling session. The following buttons are available:

- **Start** applies the settings in the polling criteria and metric selection areas and launches a new polling session. All statistical data from previous polling sessions are discarded.
- **Pause** suspends the current polling session. Statistical data collected to this point remain in the data panel area.
- **Continue** resumes the polling session. All subsequent statistical data are added to the data panel area. When polling is resumed after a pause, all metric values will be reset to null for the first poll after resuming. The null value makes a break point on the graph to make a pause and resume

more visible. In the data record file, the null values appear as empty between the delimiter. All baseline values are reset to the value collected from the first poll taken after you click Continue.

- **Stop** ends the polling for the current settings. If you wish to restart polling using the same settings, click **Start**.
- **Reset Baseline** resets the value of all baseline delta metrics. No other metric will be affected by this reset and all previous data (gathered before the reset) will be maintained and can be viewed and saved. This button is only enabled when baseline delta metrics are being measured during active polling.

Status line

The status line appears at the bottom of the **Data Viewer** window. The status line displays messages about the connection process. For example, the message "Waiting for server response" is displayed during a connection attempt to a component.

When the connection is made, the status line shows the device type and name, and the name of the component that is selected.

Graph button

When you click the Graph button, the Graph window opens. See "Graph window" (page 46).

The **Graph** button is enabled for all views in real time mode. It is enabled for some files in replay mode in any of the four views. These files include DV collected record (CSV), Management Data Provider (MDP) collected statistics, Statistics Retrieval System (SRS) and Streamed Passport Statistics (PMSP) files.

Authenticate dialog

The **Authenticate** dialog provides userid and password authentication to a Passport device. The dialog opens when you enter the Passport device name or select an item from the menu of the Data Viewer window in real-time mode. The dialog contains the following fields:

- **Group** contains a menu of all Passport groups. You can select an item from the menu.

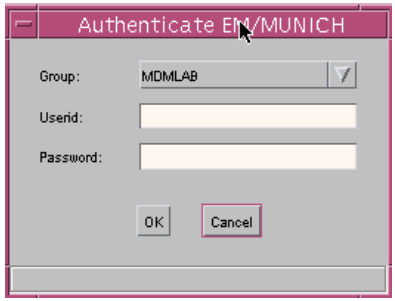
- **Userid** contains the userid to authenticate
- **Password** contains the password to authenticate

The **Authenticate** dialog contains the following command buttons:

- **OK** begins the authentication process. The **Authenticate** dialog closes when the authentication succeeds. If the authentication fails, another dialog describing the problem opens.
- **Cancel** closes the **Authenticate** dialog. All information in the dialog is ignored.

See the figure “Authenticate dialog” (page 30).

Figure 3
Authenticate dialog



Working with Data Viewer Saved Statistics files

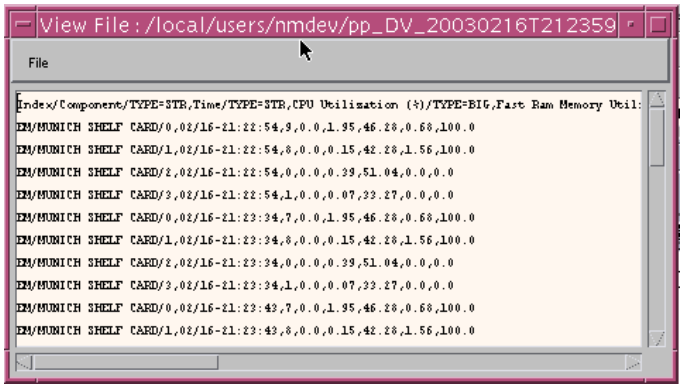
The Data Viewer lets you write the information it collects in real-time mode to a Data Viewer Saved Statistics file and save it for future reference. The Data Viewer Saved Statistics file is updated as new data is received.

The Data Viewer Saved Statistics file is saved in your home directory, unless you specify an alternate path. If you wish you can change the default directory by double clicking on a directory name.

The information of a Data Viewer Saved Statistics file matches the information you entered in the polling criteria and metric selection areas of the **Data Viewer** window.

The figure “Data Viewer Saved Statistics file” (page 32), shows an example of this file.

Figure 4
Data Viewer Saved Statistics file



Applicable to replay mode

Note: This section applies to replay time mode. See the following sections: “Applicable to real time mode” (page 20), and “Applicable to real-time and replay modes” (page 37).

In replay mode, you can view collected data from

- Performance Measurement Stream Processor (PMSP)
- Management Data Provider (MDP)
- Statistical Retrieval System (SRS)
- Data Viewer

Note: This document does not contain information on PMSP, MDP or SRS. See 241-6001-309 *Preside MDM Management Data Provider User Guide*.

This section contains the following information on replay mode:

- “Data Viewer window for replay mode” (page 33)

Data Viewer window for replay mode

The **Data Viewer** window for replay mode is described in this section. Replay mode lets you replay data collected by Management Data Provider (MDP), Statistical Retrieval System (SRS), Performance Management Stream Processor (PMSP, and Data Viewer. Data is viewed in bulk data format (BDF) or comma separated value (CSV) format.

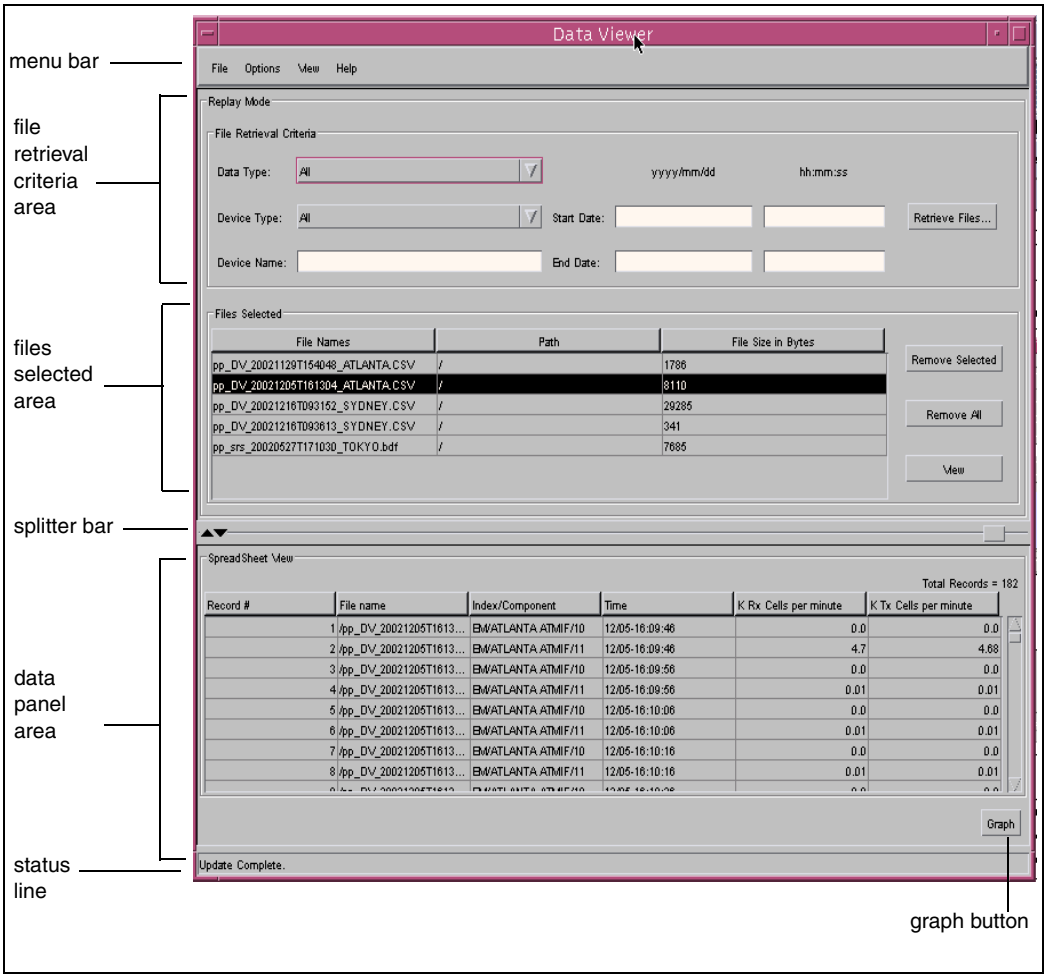
This section contains the following sections:

- "Menu bar" (page 34)
- "File retrieval criteria area" (page 36)
- "Files selected area" (page 37)

The figure, "Data Viewer window - Replay mode in spreadsheet view" (page 34), show a sample display of the **Data Viewer** default window.

A splitter bar between the metric selection area and the data panel area divides the Data Viewer window into two adjustable window panes. You can adjust the window panes to hide or show each area or to have one area fill the entire Data Viewer display. To change the relative size of each window pane, click and drag the mouse over one of the window pane movement arrows.

Figure 5
Data Viewer window - Replay mode in spreadsheet view



Menu bar

The menu bar commands let you to use the Data Viewer and view its performance information. The menu bar contains the following menus:

- File menu
- Options menu

- View menu
- Help menu

File menu

The **File** menu contains the following command:

- **Exit** terminates the polling or file retrieval session and closes all Data Viewer windows.

Options menu

The **Options** menu contains the following commands:

- **Real-Time Mode** *sets the collection mode to real time. When this option is selected,* **Real-Time Mode** *is disabled.*
- **Select RDF** displays a dialog to select an RDF file. The specified RDF file is used to view the selected Bulk Data Format (BDF) files in replay mode.
- **Unselect RDF** clears the selected RDF file when this menu item is selected.

View menu

The **View** menu contains a list of data views. The view you select is displayed in the data panel area. You can only select one view at a time. When a view is selected, its menu option is disabled. The **View** menu contains the following commands:

- **Spreadsheet View** sets the data displayed in the data panel area to Spreadsheet View.
- **Record View** sets the data displayed in the data panel area to **Record View**.
- **Component View sets the data displayed in the data panel area to Component View.**

Help menu

The **Help** menu contains the following commands:

- **Help on Context** contains help information on a specific object in the window. When you select this command, the cursor changes to a question mark. You can then place it anywhere on the window, click and online help is displayed.
- **Help on Window** provides descriptive help information about a window.

File retrieval criteria area

The file retrieval criteria area lets you select files that you want to replay. The file retrieval criteria area consists of the following input areas:

- **Data Type** is a pull-down list of the following data types: **Accounting**, **Alarm**, **All**, **Availability**, **Data Viewer Saved Statistics**, **Log**, **Outage**, **SRS**, **Scn**, **Statistics**, **Streamed Passport Statistics**. The default is **All** for all data types.
- **Device Type** is a pull-down list of the following device types: **All**, **DPN**, **Others**, **Passport**. Selecting **Device Type** lets you filter on specific device types. The default is **All** for all device types.
- **Device Name** lets you type in a device name to filter on. This field matches the following field of filename field depending on the selected data type:
  - specify <nodename | nodeid> for Accounting, Alarm, Scn, Log, Statistics and Outage data types
  - device name has no impact on Availability type
  - specify <nodename> for SRS and Data Viewer Saved Statistics data types
  - specify <Passport-groupname> in Streamed Passport statistics data type
- **Start Date** lets you specify a range of the start date (yyyy/mm/dd) and time (hh:mm:ss) of the filename to be filtered. Any files with the start date and time larger than the Start Date are selected.
- **End Date** lets you specify a range of the end date (yyyy/mm/dd) and time (hh:mm:ss) of the filename to be filtered. Any files with the end date and time smaller than the End Date are selected.

- **Retrieve Files** opens the **File Selection** dialog that contains a tree representation of the available directions and files of the selected type from which you can navigate the file system to locate files of the selected data type.

Files selected area

The files selected area displays a listing of the files that you retrieved. The files are displayed in tabular format. You can click and drag a column heading to reorder the columns.

This area consists of the following input areas:

- **File Names displays the name of the files selected for possible viewing.**
- **Path displays the directory location of the selected BDF files.**
- **File Size in Bytes** displays the size of each selected BDF file.
- **Remove Selected** removes the selected file from the **Files Selected** area.
- **Remove All** removes all files from the **Files Selected** area.
- **View** lets you view the selected files in the specified view.

Applicable to real-time and replay modes

This section contains information that applies to both real-time mode and replay mode. See the following information:

- "Data panel area" (page 37)
- "Graph window" (page 46)

Data panel area

The data panel area in the **Data Viewer** window in real-time mode displays the metric values collected during the current polling session, and the retrieved data files in replay mode.

In real-time mode, the maximum number of records that may be collected in real time is 50,000/(number of metrics polled + 2). When this number is reached, the oldest set of data records is discarded and replaced by the latest set of data records received.

The data appear in red if the values exceed the thresholds defined in the metric file for the component.

The data panel area displays one of the following views:

- spreadsheet
- record
- component
- latest poll

The information displayed in the views is displayed in the following columns:

1 **Record #** contains the record number. This column is visible in spreadsheet view and record view.

2 **Index/Component** is visible in real-time mode. The **Index/Component** column contains either the Passport name or the Simple Network Management Protocol (SNMP) device indexID of the component(s), and the component that you are monitoring.

Note: The Index/Component is visible in the spreadsheet, record and latest poll view in real-time mode. In component view, the component is shown in a tree diagram.

File name is visible in replay mode. This column contains the location and the name of the file.

3 **Time** is visible in real-time mode. This column contains the time the metrics were received.

4 The remaining columns contain metric values or data from replayed files.

Spreadsheet view

The spreadsheet view displays the data values in spreadsheet tabular format. Spreadsheet view supports real-time mode and replay mode. Spreadsheet view is the default view in replay mode if the data type is **Accounting**, **Alarm**, **SCN**, **Log** or **Outage**.

Spreadsheet view uses a record description file (RDF) to label each column if the data is in bulk data format (BDF).The data in the first row of a comma separated value (CSV) file is used to label each column if the data is in CSV format.

When you select a row, and then click **Graph**, you can view the detailed statistics table and the summary table. You can display summary or detailed statistics by selecting a tab.

Note: The field names are described in “Data panel area” (page 37).

See the following figures:

- “Real-time - Spreadsheet view” (page 40) shows the Data Viewer window in real-time mode and spreadsheet view.
- “Replay - Spreadsheet view” (page 41) shows the Data Viewer window in replay mode and spreadsheet view.

Figure 6
Real-time - Spreadsheet view

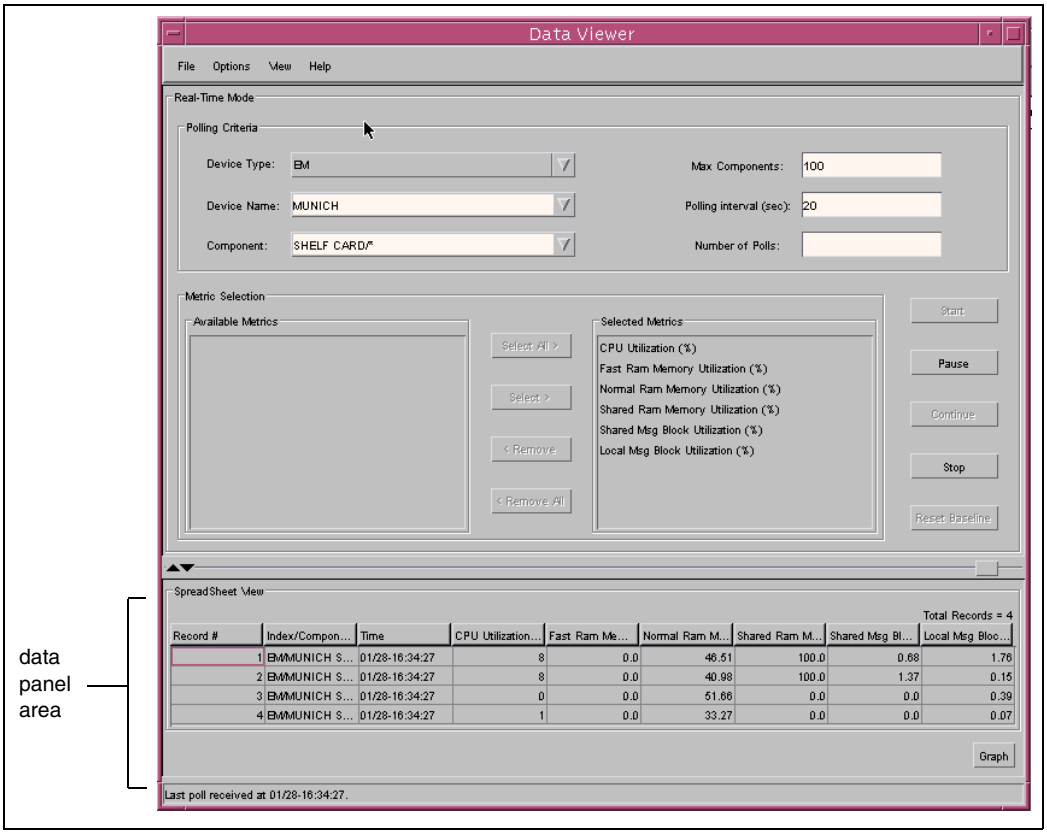
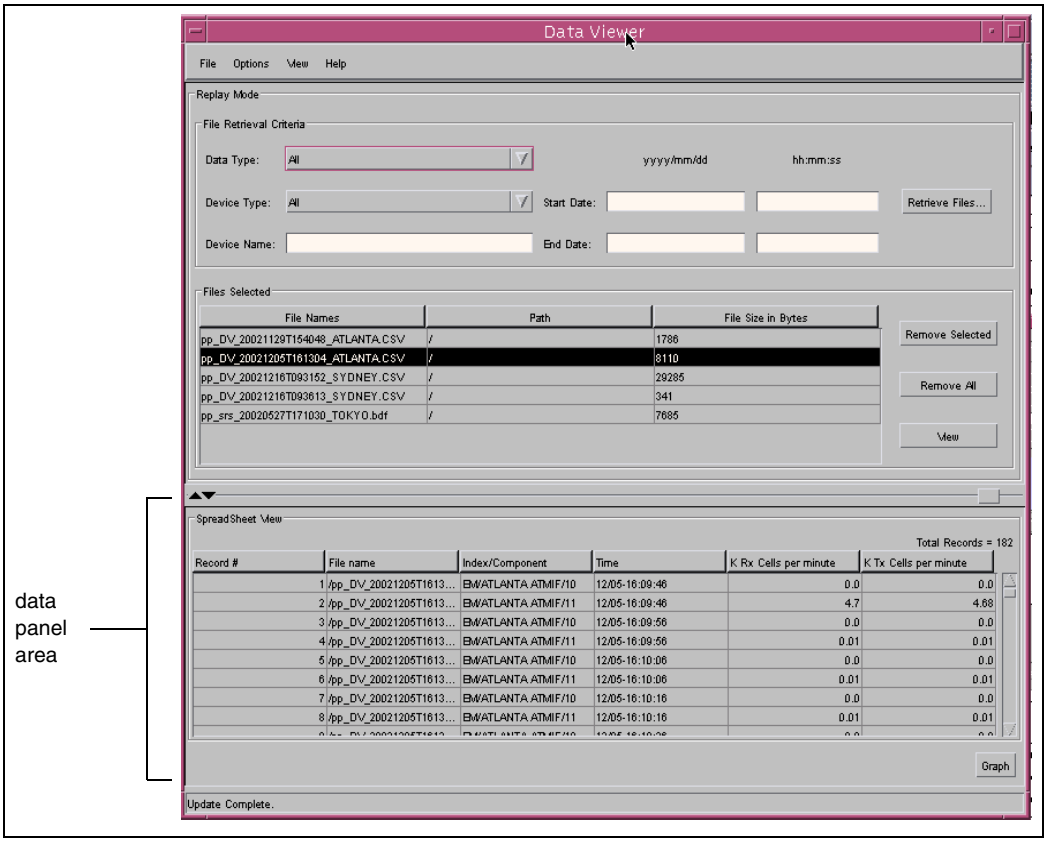


Figure 7
Replay - Spreadsheet view



Record view

The record view supports all device types in real-time mode and all data types in replay mode.The record view shows the field name and the field value. Selecting the record number displays the content of the record at the right.

When you select a record number, and then click **Graph**, you can view the detailed statistics table and the summary table of the component instance specified in the selected record. You can display summary or detailed statistics by selecting a tab.

Note: The field names are described in “Data panel area” (page 37).

See the following figures:

- "Real-time - Record view" (page 42) shows the Data Viewer window in real-time mode and record view.
- "Replay - Record view" (page 43) shows the Data Viewer window in replay mode and record view.

Figure 8
Real-time - Record view

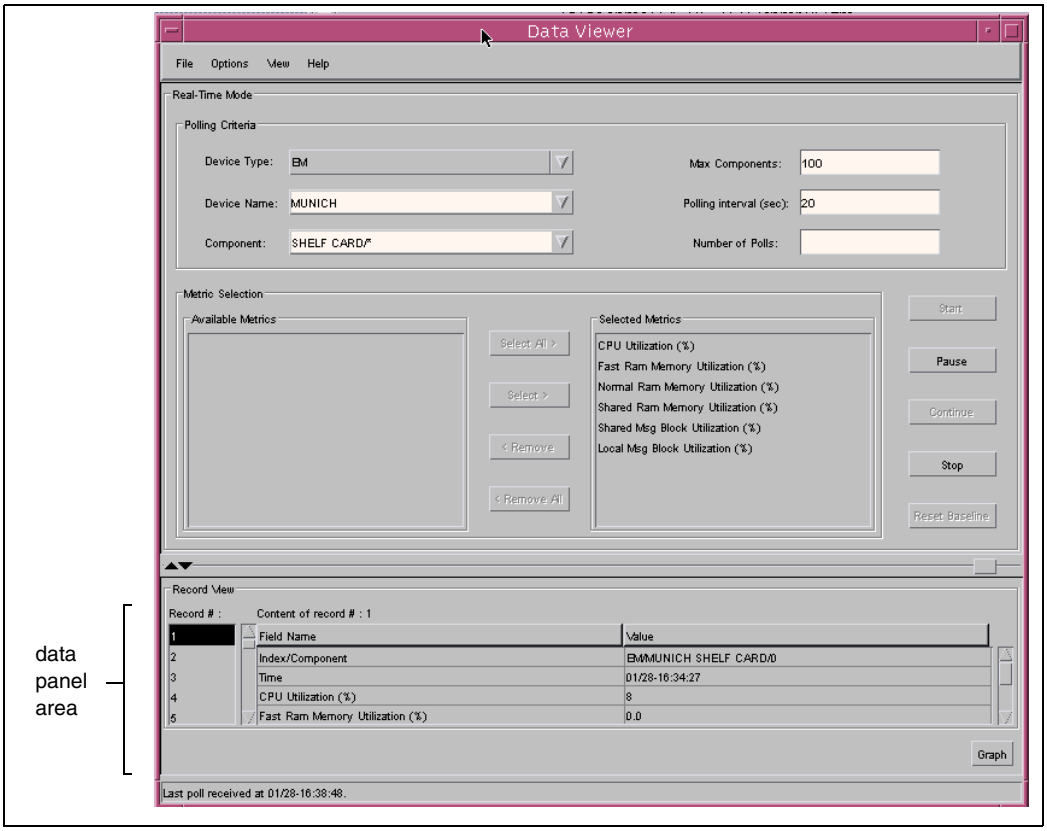
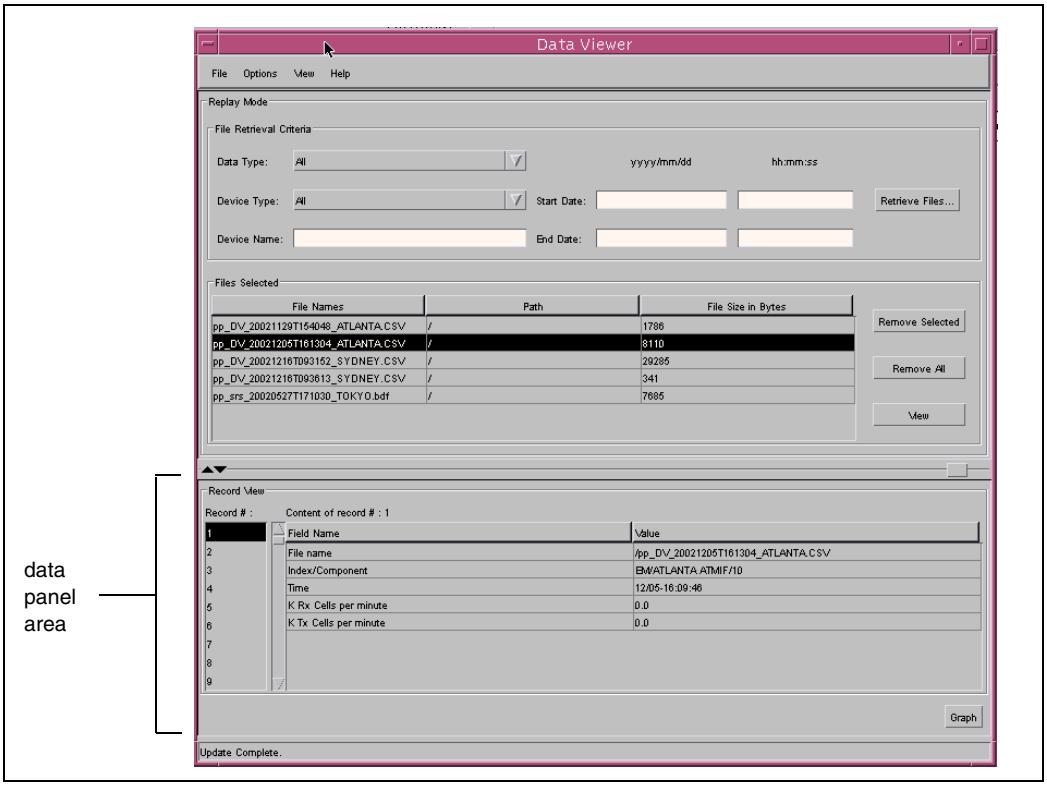


Figure 9
Replay - Record view



Component view

The component view supports all device types in real-time mode. In replay mode, the component view supports the data types: **SRS**, **Streamed Passport Statistics**, **Data Viewer Saved Statistics**, and Management Data Provider statistics.

The panel displays the components and subcomponents in the data collected in real-time collection mode or the selected files in replay mode. The component information is displayed in a tree format. Select a component in the component tree to view the records associated with the component in detail and summary tables. When you click **Graph**, you can view the **Graph** window associated with the selected component. You can display summary or detailed statistics by selecting a tab.

Note: The field names are described in “Data panel area” (page 37).

See the following figures:

- “Real-time - Component view” (page 44)
- “Replay - Component view” (page 45)

Figure 10
Real-time - Component view

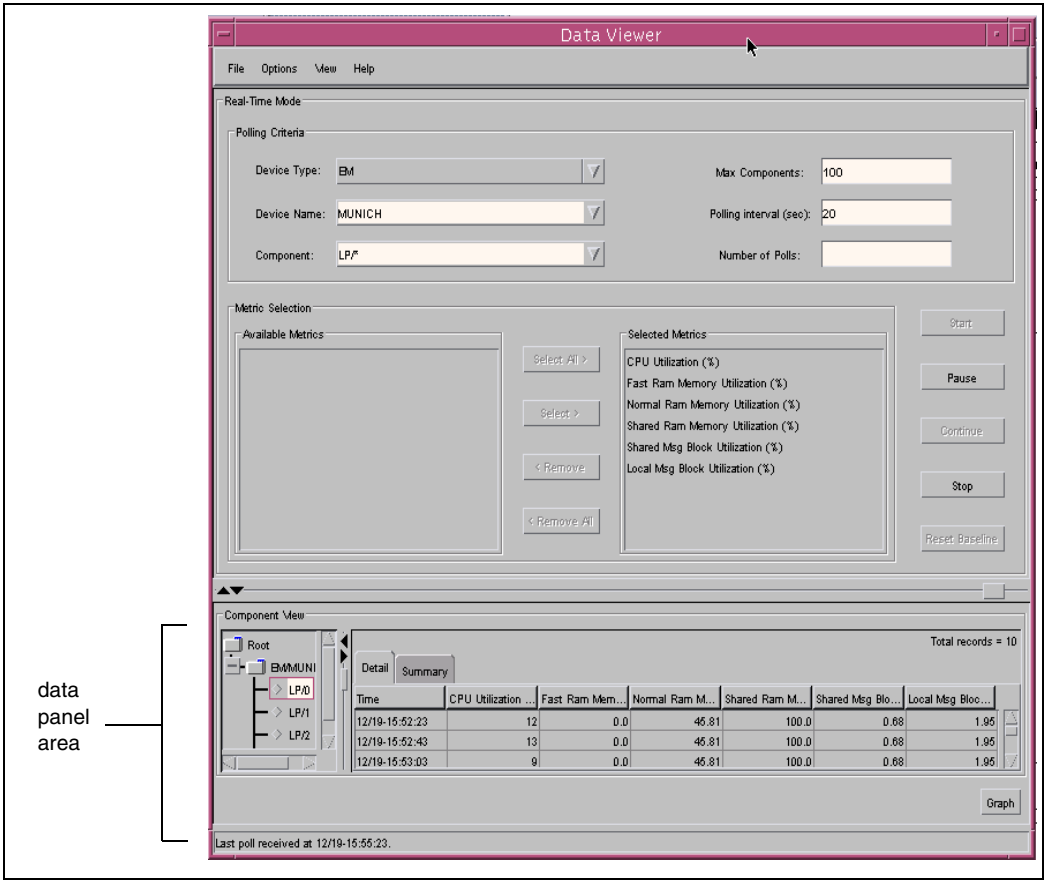
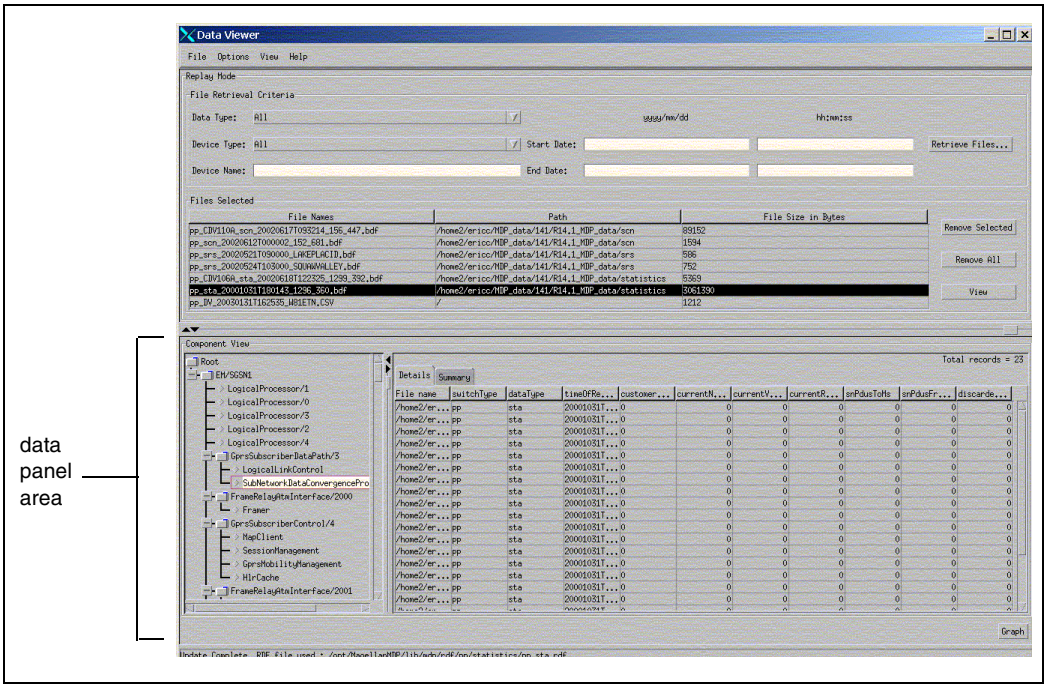


Figure 11
Replay - Component view



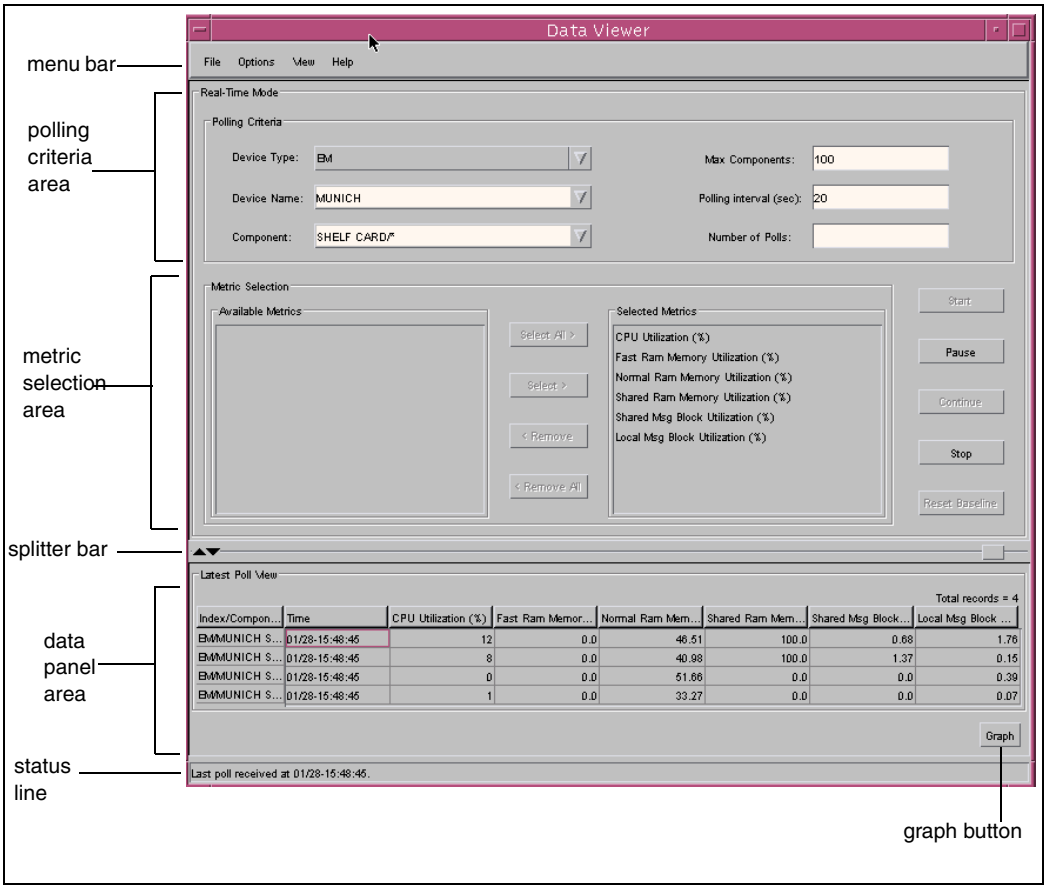
Latest poll view

The latest poll view supports real-time mode only. The latest poll view is the default view for real-time collection mode. Latest Poll View displays the metric values from the latest poll during the current polling session. Each row of data in the latest poll view applies to a different component instance. When you select a row, and then click **Graph**, you can view detailed statistics table and the summary table. You can display summary or detailed statistics by selecting a tab.

Note: The field names are described in “Data panel area” (page 37).

The figure “Real-time - Latest poll view” (page 46) shows the Data Viewer window in real-time mode and latest poll view.

Figure 12
Real-time - Latest poll view



Graph window

The **Graph** window opens when you select a row or a component in the data panel, and click **Graph**. Depending on whether the Data Viewer is operating in real time mode or replay mode, and the file type replayed, the **Graph** button is enabled to allow viewing the data in a graphical display.

The **Graph** window provides summary and detailed performance information for the selected component, when you select the **Detail** or **Summary** tab. The information is available in both textual and graphical formats.

Metric field values for a particular component are displayed in graphical format. Only the metric fields you select appear in the graph. The line displayed in the graph for each metric field matches the color you selected in the graph selection table.

Three types of graphs are available: thumbnail, multi graphs, and trend graphs. You can select a graph type by clicking the appropriate tab in the graph area. Different metric fields are displayed on the graphs with different colors. The color of the line representing the metric in the graph is determined by the color of the metric defined in the graph selection table.

You can launch multiple **Graph** windows, one for each component in the statistics shown in the data panel area.

The **Graph** window contains summary and detailed statistics tables. Selecting the **Detail** or **Summary** tab displays the appropriate table.

See the figures "Graph window: Summary panel" (page 48) and "Graph window: Detail panel" (page 49) for sample displays.

The **Graph** window contains the following areas:

- "Title bar" (page 50)
- "Menu bar" (page 50)
- "Statistics tables" (page 50)
- "Graph area" (page 52)
- "Graph selection table" (page 56)

A splitter bar separates the summary or detail statistics display into two adjustable window panes. Clicking the mouse on one of the arrows in the splitter bar lets you configure the size of the window panes. You can adjust

the window panes to hide or show each area or to have one area fill the entire Data Viewer display. Another splitter bar separates the graph and graph selection table.

Figure 13
Graph window: Summary panel

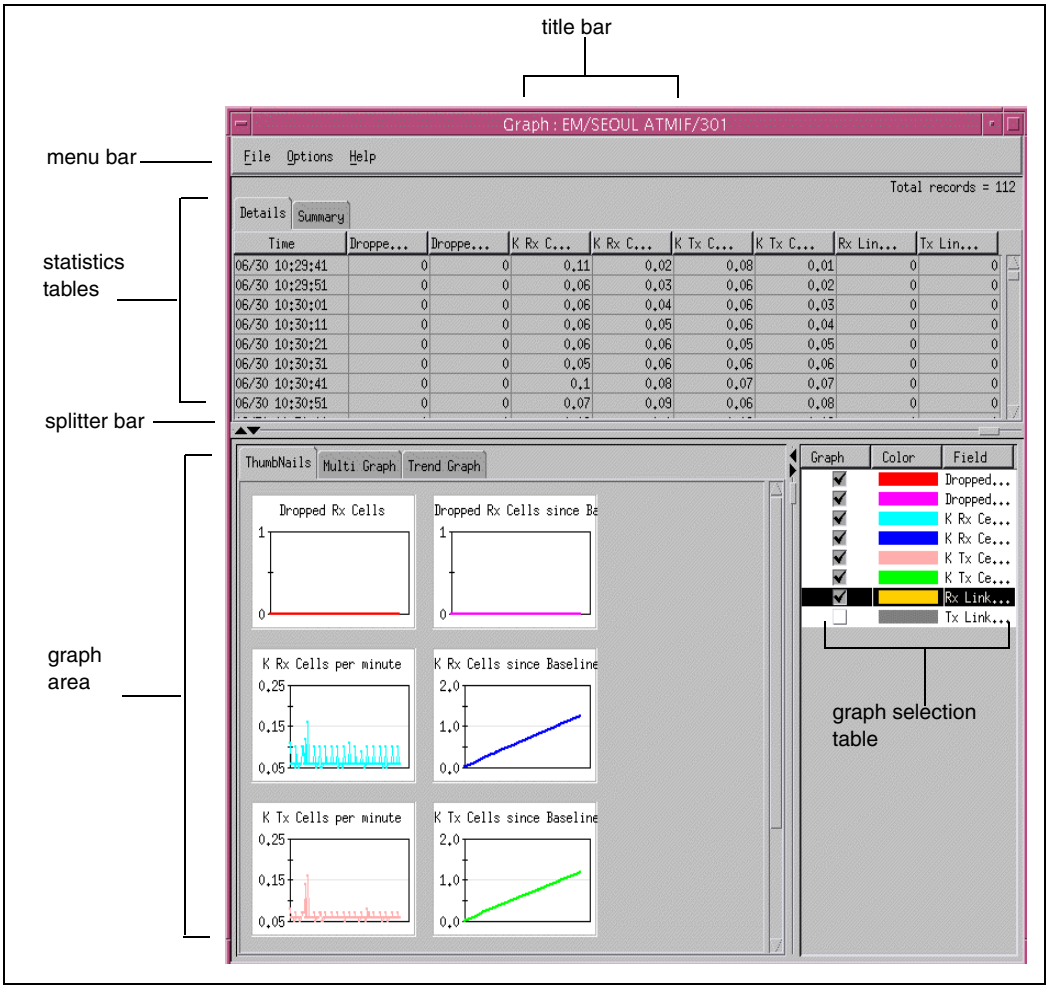
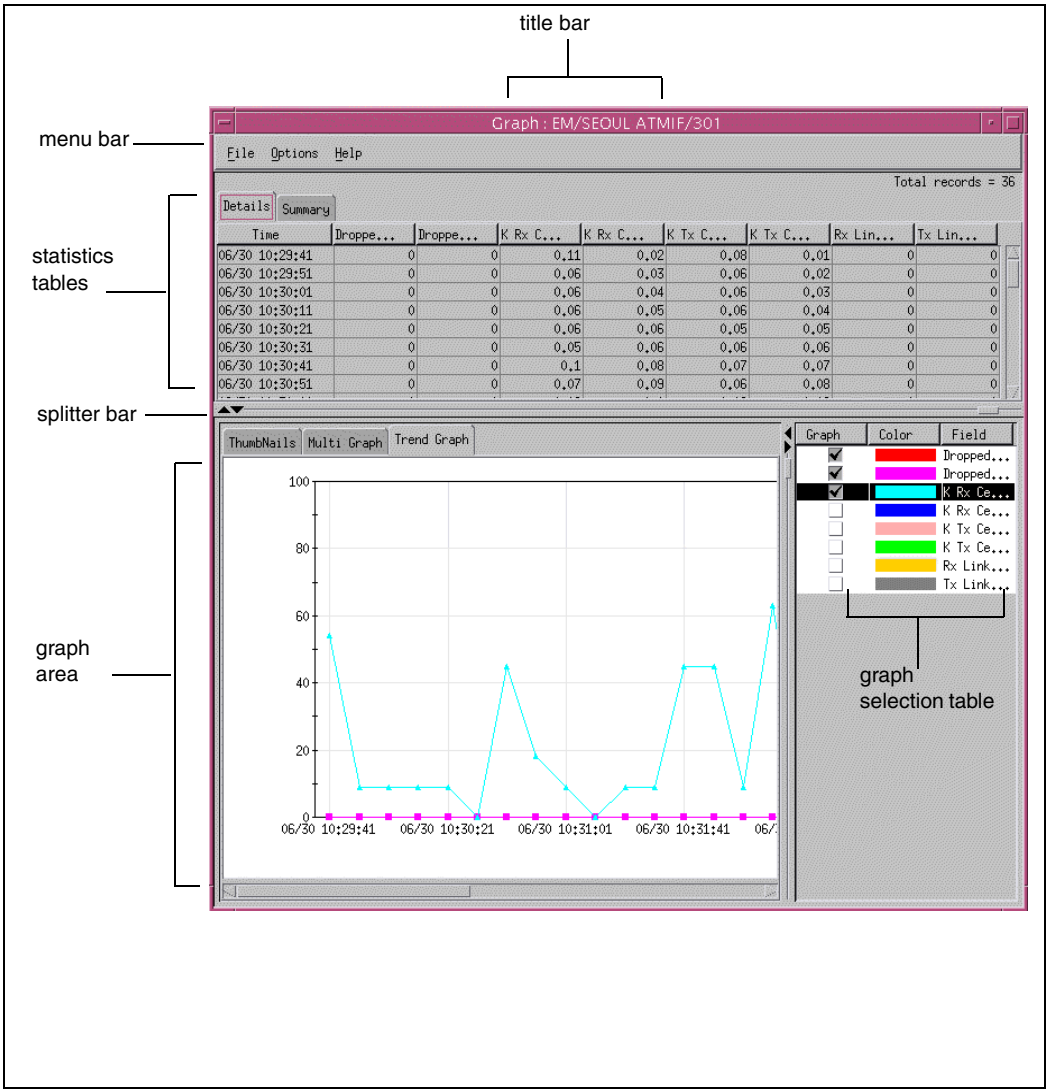


Figure 14
Graph window: Detail panel



Title bar

The title bar in the **Graph** window identifies the component to which the data applies. The title bar displays the full component name, including the device type and name.

Menu bar

The menu bar in the **Graph** window contains the following menus:

- "File menu" (page 50)
- "Options menu" (page 50)
- "Help menu" (page 50)

File menu

The **File** menu in the **Graph** window contains the following commands:

- **Close** closes the **Graph** window.

Options menu

The **Options** menu in the **Graph** window contains the following commands:

- **Line** changes thumbnail, multi graphs, and trend graphs to line graphs
- **Bar changes thumbnail, multi graphs and trend graphs to bar graphs**

Help menu

The **Help** menu in the **Graph** window contains the following commands:

- **Help On Context** contains help information on a specific object in the window. When you select this command, the cursor changes to a question mark. You can then place it anywhere on the window, click and online help is displayed.
- **Help On Window** provides descriptive help information about a window.

Statistics tables

The statistics table appears in the upper half of the **Graph** window. The table displays the values for each record in the record file. The table displays metric values for each of the metrics polled for a particular component. New data is added to the statistics tables as it is received. The data appear in red if the

values exceed the thresholds defined in the metric file for the component. You can display summary statistics or detailed statistics by selecting the appropriate tab.

Summary statistics

Numeric type values are displayed in the summary statistics table. Summary statistics are available when you select the **Summary** tab. The **Summary** tab contains the following information:

- **Field** contains the names of the metrics.
- **Minimum** contains the minimum value of the statistic data collected for each of the metrics.
- **Maximum** contains the maximum value of the statistic data collected for each of the metrics.
- **Average** contains the average value of the statistic data collected for each of the metrics.

Detailed statistics

Numeric and string type values are displayed in the detailed statistics table.

Detailed statistics are available when you select the **Detail** tab. The detailed statistics table provides statistic data (numeric type or string) collected for each of the metrics polled for a particular component.

The detailed statistics table contains

- a record received for the component at different polling intervals (real-time mode)
- a record in a file associated with the selected component (replay mode)
- the name of each field that is being is displayed in each column. You can change the order of the columns by dragging each header to its new location.

  Note: The number of **Graph** windows opened and the number of graphs running also impacts the memory usage.

Graph area

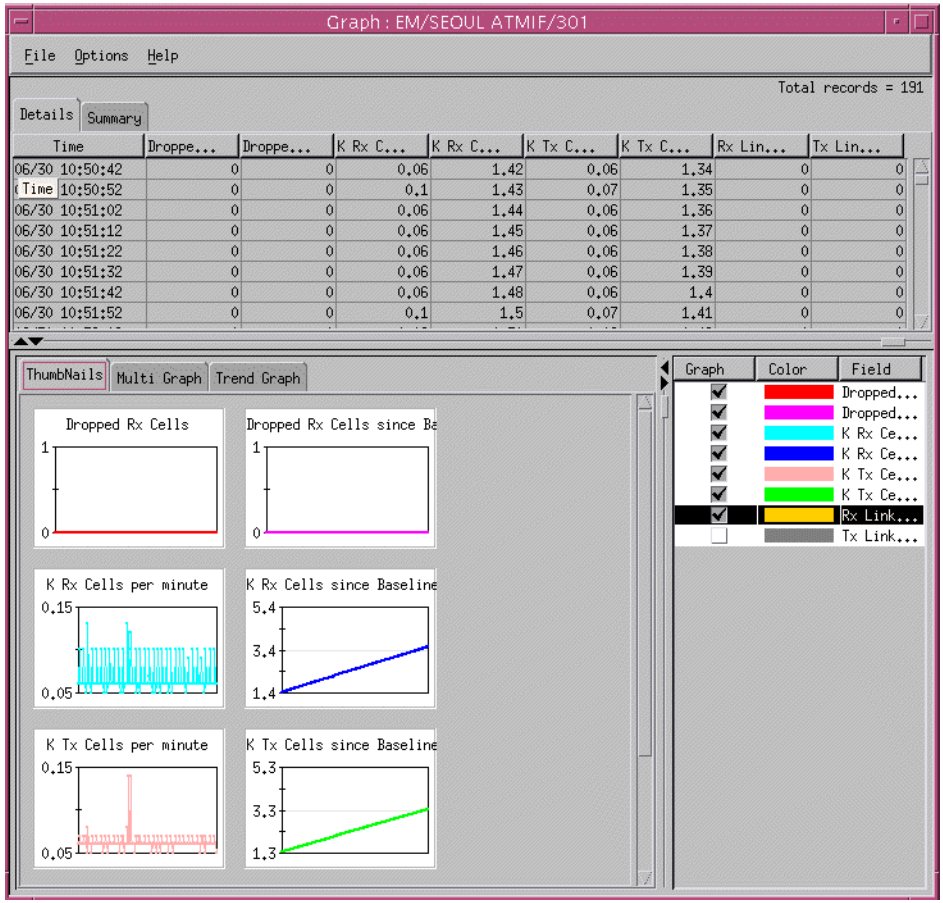
The graph area appears in the lower half of the **Graph** window. The graph area displays metric field values for a particular component in graphical format. Only the metric fields you select appear in the graph. The line displayed in the graph for each metric field matches the color you selected in the graph selection table.

Three types of graphs are available: thumbnail, multi graphs, and trend graphs. You can select a graph type by clicking the appropriate tab in the graph area. From the **Options** menu, you can change thumbnail, multi graphs and trend graphs to a line graph or a bar graph by selecting the **Line** or **Bar** command. Different metrics are displayed on the graphs with different colors. The color of the line representing the metric in the graph is determined by the color of the metric defined in the graph selection table.

New data is added to the graph as it arrives in real-time mode.

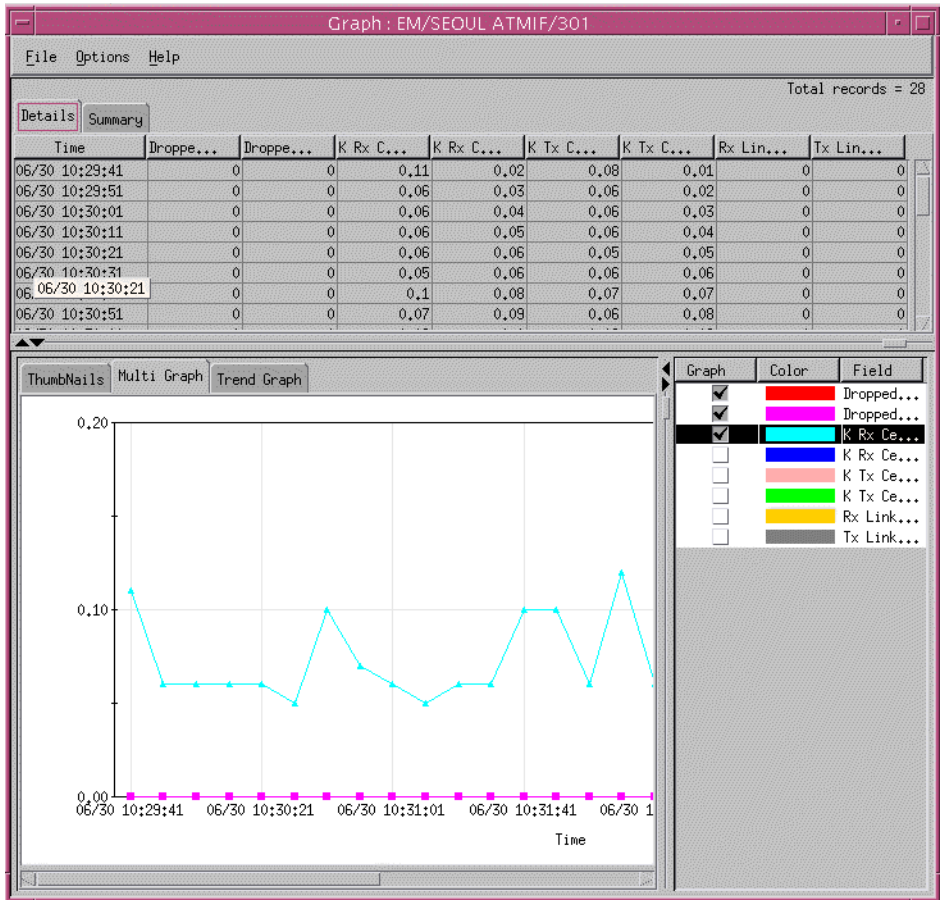
See the figures “Graph window showing thumbnail graphs” (page 53), “Graph window showing multi graphs” (page 54), and “Graph window showing trend graphs” (page 55).

Figure 15
Graph window showing thumbnail graphs



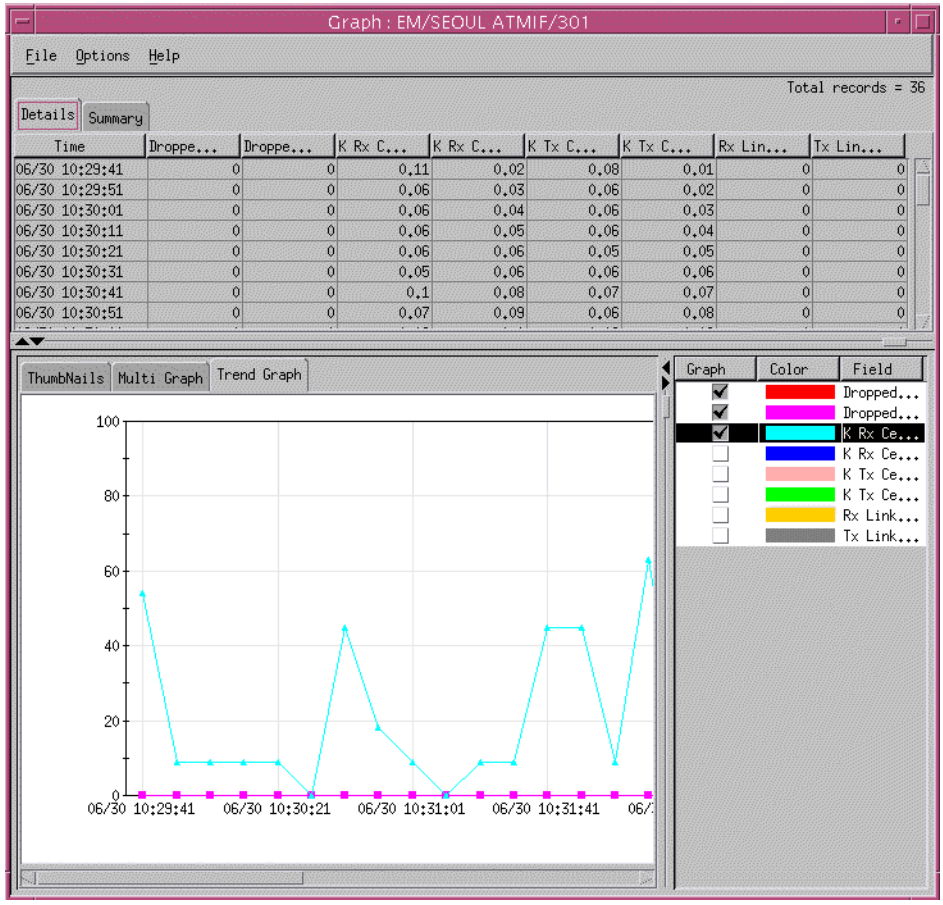
The multi graph shows an absolute graph. The X axis shows the time value. If there is not enough space, not all the time values are displayed in the trend and multi graph panels. Use the horizontal scroll bar to view the other time values. The Y axis shows the field value.

Figure 16
Graph window showing multi graphs



The trend graph is a percentage relative scale with the Y axis showing the field value relative to the maximum. The comparison is with the instance field value to the maximum value on this field that has occurred during the time captured in the trend graph. The X axis shows the time stamps when the field values are polled

Figure 17
Graph window showing trend graphs



Graph selection table

Only statistics metrics with numeric type are displayed in the graph selection table. The graph selection table contains the following columns:

- **Graph** contains a list of checkboxes that you can use to select metric fields for graphical display. Only the metric fields that you select in this table appear in the graph. The checkboxes can reduce or filter the metric fields to be shown on the graphs. For more information on the graphical display, see “Graph area” (page 52).
- **Color** contains the color of the graph associated with a metric fields. A default color is assigned to each metric. You can change the color by clicking in the “Color” column for the metric. This launches the “Pick a Color” window which lets you select a new color.
- **Field** contains the name of the metric fields.

Chapter 3
Data Viewer procedures

This section contains the following Data Viewer procedures:

Procedures for real-time mode

This section contains the following procedures that you need to use the Data Viewer in real-time mode.

Getting started

Collecting performance information

- "Collecting performance information for multiple components for Passport devices" (page 72)

Controlling the display of performance information

- "Controlling data collection" (page 77)

Data recording

- "Replaying data files on a remote workstation" (page 98)
- "Viewing a Data Viewer Saved Statistics file" (page 80)
- "Stopping data recording" (page 81)

Integrating SNMP devices

- "Creating a new metric file for SNMP devices" (page 83)
- "Updating the Data Viewer agent map file" (page 86)
- "Updating the PMDCD configuration file" (page 87)
- "Updating the Data Viewer client configuration file" (page 88)

Integrating Passport devices

- "Creating a new metric file for Passport devices" (page 89)
- "Updating the Data Viewer agent map file" (page 86)

Updating metric files

- "Updating an existing metric file for SNMP and Passport devices" (page 93)

Updating Data Viewer files

- "Updating the Data Viewer agent map file" (page 92)
- "Updating the PMDCD configuration file" (page 87)
- "Updating the Data Viewer client configuration file" (page 88)

Starting the Data Viewer from the Preside MDM window in real-time mode

You can analyze performance data in real-time when you use this mode.

Procedure steps

1 In the **Preside MDM** window, select **Performance** -> **Data Viewer**.

The **Data Viewer** window opens. The default is real-time mode and latest poll view.

Starting the Data Viewer in real-time mode from within another fault management tool

You can start the Data Viewer from the following fault management tools:

- Network Viewer
- Component Information Viewer
- Component Status Display
- Network Status Bar
- Alarm Display
- Circuit Viewer

Procedure steps

1 From a fault management tool, open the **Start Tools** menu. For details, refer to the tool's documentation.

A pop-up menu opens.

2 From the pop-up menu, select **Performance** -> **Data Viewer**.

The **DataViewer** window opens.

Collecting performance information for a single component instance for SNMP devices

If you start the DataViewer from within another fault management tool by clicking an object, the device type and name, and the component name for the object, are displayed in the **Data Viewer** window at start-up. In this case, begin at step 4 of this procedure.

Otherwise, begin at step 1.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

1 In the **Device Type** field of the **Data Viewer** window, select the SNMP device type from the pull-down list.

The SNMP device type is extracted from the Data Viewer agent map (pmrtype.map) file when you integrate an SNMP device into Data Viewer.

2 In the **Device Name** field, enter the device name.

A list of device names associated with the device appears in the **Device Name** field of the **Data Viewer** window. You can also click the down arrow in the **Device Type** field to scroll through the device names.

3 Specify the component to monitor.

a. Do one of the following:

Click the down arrow at the right of the **Component** field to scroll to the component name.

Type the component name in the **Component** field.

The fully defined component name appears in the **Component** field. There can be multiple component levels in the fully defined component name, for example, CA/1 SH/1 BRM/5

A forward slash after a component name indicates that there are multiple instances of that component. You must specify the instance for each of these components.

b. If a forward slash appears after a component name, type the number of the component after the slash.

Pressing the right arrow on the keyboard moves the cursor to the next component that requires a component number.

c. Press Enter.

The message area at the bottom of the **Data Viewer** window displays status information on device and component connection. When connection is successful, a message in the status line indicates that the metric list was received.

The metrics that are available for the component appear in the **Available Metrics** list. You can add new metrics for the component, if required. For information on adding metrics see “Applicable to replay mode” (page 32).

4 Enter the number of seconds for gathering data in the **Polling interval (Secs)** field.

The polling interval default setting is 60 seconds. You can choose an interval between 30 and 600 seconds (10 minutes).

CAUTION:
Selecting a low polling interval can flood the network and affect its performance.

5 If you wish to limit the number of times data is collected for this component, type a number in the **Number of Polls** field.

Polling stops when the number of polls reaches the **Number of Polls** value.

If you do not enter a number in this field, data collection continues until you click **Pause** or **Stop,** or select **File** -> **Exit** from the Data Viewer.

6 In the **Available Metrics** list, select the metrics to poll:

a. Click the metric name in the **Available Metrics** list.

b. Click **Select** to move the selected metric to the **Selected Metrics** list.

You can click **Remove** to remove metrics from the **Selected Metrics** list.

Note: For a metric description, select the metric, and then right-click to display **Help.** A dialog displays the selected metric's description.

7 Click **Start** to begin data collection.

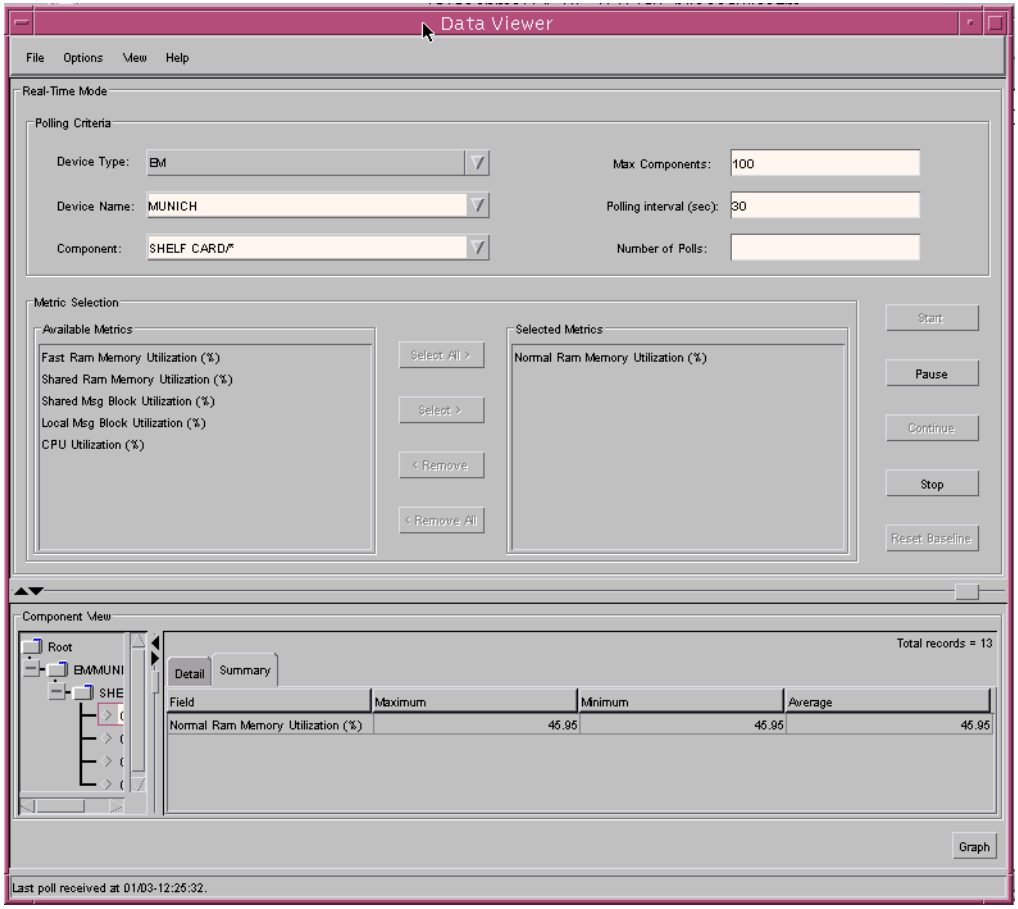
8 If the metrics for the selected component requires the index from a MIB table column, the **Index Selection** dialog opens. Select the index for the component from the dialog.

Incoming data appears in the data panel area in the lower half of the **Data Viewer** window. A delay equal to the number of seconds in the polling interval can occur before data starts arriving.

You can change the order of the columns in the data panel area and sort the values for each metric in ascending order. See "Rearranging data display" (page 108).

From the **View** menu, you can change the view.

You can view detailed performance information about each component you are monitoring. See "Viewing summary and detailed performance information" (page 109).



This sample screen displays information about a single component instance. The **Data Viewer** used a polling interval of 30 seconds.

Collecting performance information for multiple components for SNMP devices

A forward slash after a component name in the **Component** field indicates that there are multiple instances of that component. To select multiple component instances to monitor, enter one of the following after the forward slash:

- Type the wild-card "*" to poll all instances of the component. These restrictions apply to the use of the wildcard:
  - — If the attributes for a component are defined in multiple MIB tables, use the wildcard only if the MIB tables have the same index structure.
  - — A component can have a different IP address than the device type it is associated with. In this case, you cannot select multiple instances of the component.
- If the component instances are sequential, type the first and last numbers in the range, separated by dots (for example, to select instances 2, 3, 4, and 5, type DIM_TI PO/2..5).

  If the attributes for a component are defined in multiple MIB tables, use this option only if the MIB tables have the same index structure.

  Use the wildcard only for the lowest component type in the component name. For example, DIM_TI PO/*
- Type the number of each component instance to be polled. Use a semi-colon to separate each component instance from the next (for example, DIM_TI PO/2;4;5).

  Use the wildcard only for the lowest component type in the component name. For example, DIM_TI PO/*

The following procedure explains how to collect performance information for multiple components. If you start the Data Viewer from within another fault management tool by clicking an object, the device type and name, and the component name for the object, appear in the Data Viewer window at start-up. In this case, begin at step 4 of this procedure.

Otherwise, begin at step 1.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

1 In the **Device Type** field of the **Data Viewer** window, select the SNMP device type from the pull-down list.

The SNMP device type is extracted from the Data Viewer agent map (pmrtype.map) file when you integrate an SNMP device into Data Viewer.

2 In the **Device Name** field, enter the device name.

A list of device names associated with the device appears in the **Device Name** field of the **Data Viewer** window. You can also click the down arrow in the **Device Type** field to scroll through the device names.

3 Select the components to monitor.

a. Do one of the following:

Click the down arrow at the right of the **Component** field to scroll to the component name.

Type the component name in the **Component** field.

The fully defined component name appears in the **Component** field. There can be multiple component levels in the fully defined component name, for example, DIM_TI PO/1;3.

A forward slash after a component name indicates that there are multiple instances of that component. You must specify the instance for each of these components.

b. If a forward slash appears after a component name, type the number of the component after the slash.

Pressing the right arrow on the keyboard moves the cursor to the next component that requires a component number.

c. Specify the multiple component instances to monitor by entering their values after the lowest level component in the **Component** field.

For guidelines on entering multiple component numbers see “Collecting performance information for multiple components for SNMP devices” (page 63).

d. Press Enter.

The message area at the bottom of the **Data Viewer** window displays status information on device and component connection. When connection is successful, a message in the status line indicates that the metric list was received.

4 In the **Max Components** field, enter the maximum number of components to monitor. You must enter a number in this field if you entered the wildcard (*) or a range of sequential component numbers in the Component field.

The metrics that are available for the selected components appear in the **Available Metrics** list. You can add new metrics for the components if required. For information on adding metrics see “Applicable to replay mode” (page 32).

5 Enter the number of seconds for gathering data.

The polling interval has a 60-second default setting. You can choose an interval between 30 and 600 seconds (10 minutes).

CAUTION:
Selecting a low polling interval can flood the network and affect its performance.

6 In the **Number of Polls** field, type a number if you wish to limit the number of times data is collected.

Polling stops when the number of polls reaches the **Number of Polls** value.

If you do not enter a number in this field, data collection continues until you click **Pause** or **Stop**, or select **File** -> **Exit** from the Data Viewer.

7 In the **Available Metrics** list, select the metrics to poll:

a. Click a metric name in the **Available Metrics** list.

b. Click **Select** to move the selected metric to the **Selected Metrics** list.

You can click **Remove** to remove metrics from the **Selected Metrics** list.

Note: For a metric description, select the metric, and then right-click to display **Help.** A dialog displays the selected metric’s description.

8 Click **Start** to begin data collection.

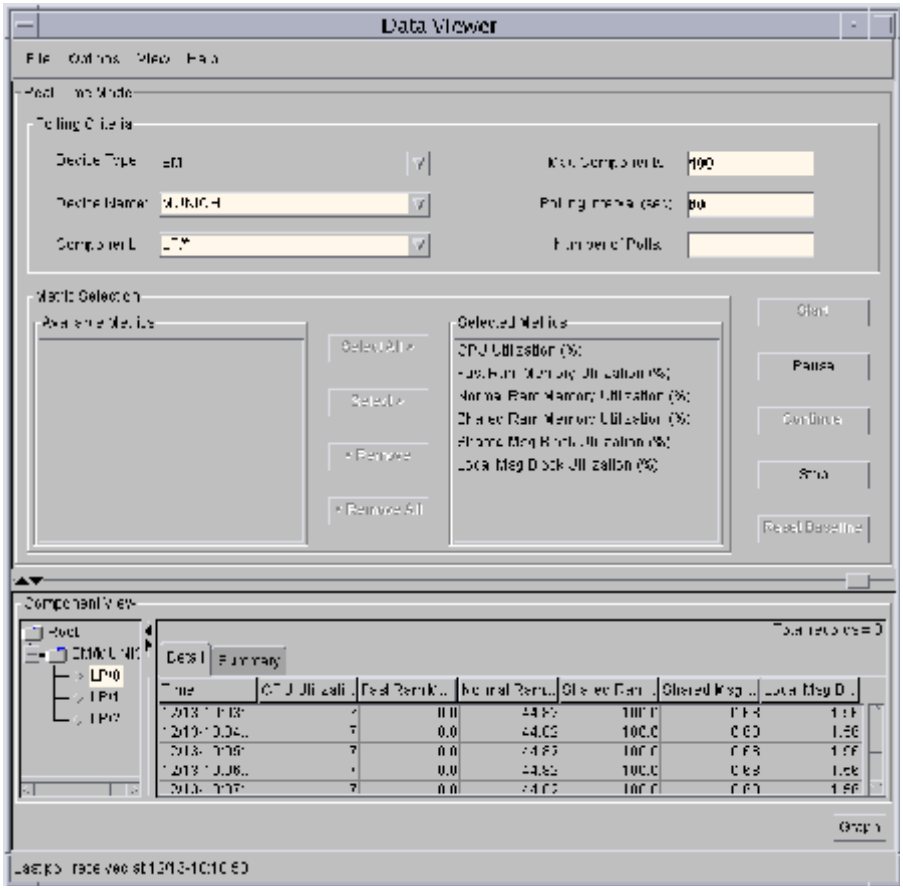
9 If the metrics for the selected components require the index from a MIB table column, the **Index Selection** dialog opens. Select the index for the component from the dialog.

Incoming data appears in the data panel area in the lower half of the **Data Viewer** window. A delay equal to the number of seconds in the polling interval can occur before data starts arriving.

You can change the order of the columns in the data panel area and sort the values for each metric in ascending order. See “Rearranging data display” (page 108).

From the **View** menu, you can change the view.

You can view detailed performance information about each component you are monitoring. See “Viewing summary and detailed performance information” (page 109).



This sample screen displays information about multiple components. The Data Viewer used a polling interval of 30 seconds.

Collecting performance information for a single component instance for Passport devices

If you start the Data Viewer from within another fault management tool by clicking an object, the device type and name, and the component name for the object, appear in the **Data Viewer** window at start-up. In this case, begin at step 4 of this procedure.

Otherwise, begin at step 1.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

1. In the **Device Type** field of the **Data Viewer** window, select the device type EM from the pull-down list.
2. In the **Device Name** field, enter the device name. A list of Passport device names appears in the Device Name field. You can also click the down arrow of the **Device Type** field to scroll to the device name.

   The **Authenticate** dialog opens.
3. Use the arrow to select the following information:
   - **Group**
   - **Userid**
   - **Password**
4. Click **OK**.

   A list of device names associated with the device appears in the **Component** field of the **Data Viewer** window.

   Note: If the authentication fails, repeat step 2.
5. Specify the component to monitor.

a. Do one of the following:

Click the down arrow at the right of the **Component** field to scroll to the component name.

Type the component name in the **Component** field.

The fully defined component name appears in the **Component** field. There can be multiple component levels in the fully defined component name, for example, CA/1 SH/1 BRM/5

A forward slash after a component name indicates that there are multiple instances of that component. You must specify the instance for each of these components.

b. If a forward slash appears after a component name, type the number of the component after the slash.

Pressing the right arrow on the keyboard moves the cursor to the next component that requires a component number.

c. Press Enter.

The message area at the bottom of the **Data Viewer** window displays status information on device and component connection. When connection is successful, a message in the status line indicates that the metric list was received.

The metrics that are available for the component appear in the **Available Metrics** list. You can add new metrics for the component, if required. For information on adding metrics see “Applicable to replay mode” (page 32).

6 Enter the number of seconds for gathering data in the **Interval (Secs)** field.

The polling interval default setting is 60 seconds. You can choose an interval between 10 and 600 seconds (10 minutes).

CAUTION:
Selecting a low polling interval can flood the network and affect its performance.

7 If you wish to limit the number of times data is collected for this component, type a number in the **Number of Polls** field.

Polling stops when the number of polls reaches the **Number of Polls** value.

If you do not enter a number in this field, data collection continues until you click **Pause** or **Stop**, or select **File** -> **Exit** from the Data Viewer.

8 In the **Available Metrics** list, select the metrics to poll:

a. Click the metric name in the **Available Metrics** list.

b. Click **Select** to move the selected metric to the **Selected Metrics** list.

You can click **Remove** to remove metrics from the **Selected Metrics** list.

Note: For a metric description, select the metric, and then right-click to display **Help.** A dialog displays the selected metric's description.

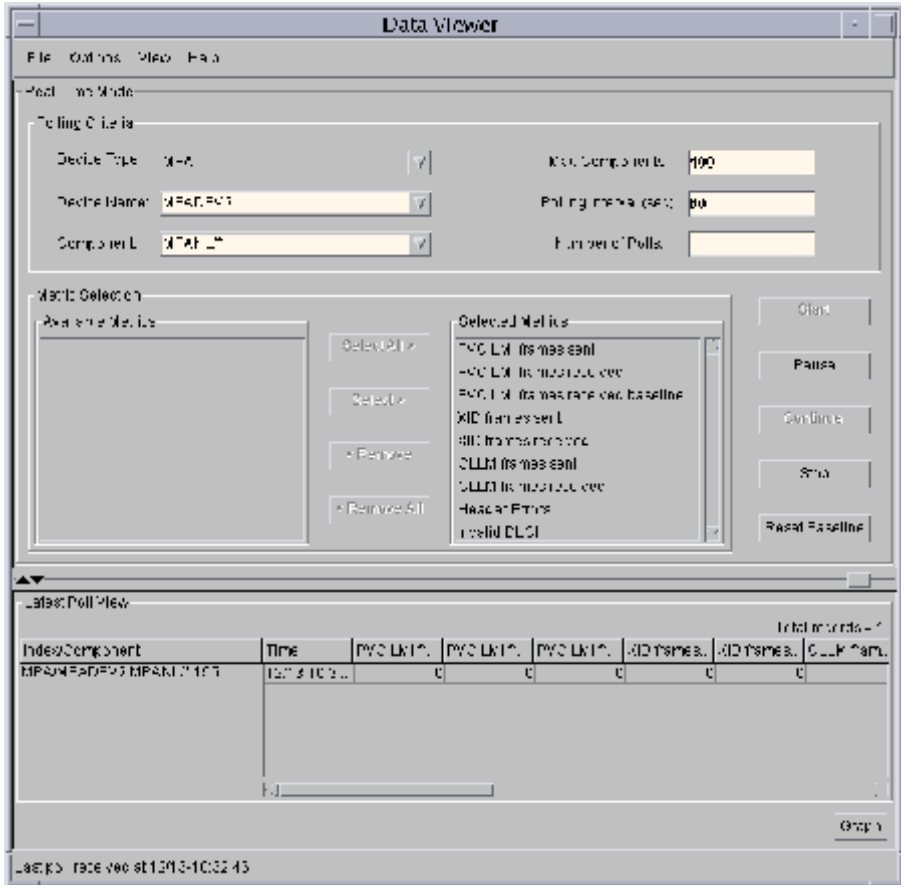
9 Click **Start** to begin data collection.

Incoming data appears in the data panel area in the lower half of the **Data Viewer** window. A delay equal to the number of seconds in the polling interval can occur before data starts arriving.

You can change the order of the columns in the data panel area and sort the values for each metric in ascending order. See "Rearranging data display" (page 108).

From the **View** menu, you can change the view.

You can view detailed performance information about each component you are monitoring. See "Viewing summary and detailed performance information" (page 109).



This sample screen displays information about a single component instance. The Data Viewer used a polling interval of 60 seconds.

Collecting performance information for multiple components for Passport devices

A forward slash after a component name in the Component field indicates that there are multiple instances of that component. To select multiple component instances to monitor, enter one of the following after the forward slash:

- Type the wild-card "*" to poll all instances of the component. These restrictions apply to the use of the wildcard.

  For Passport, you can use the wildcard character, "*", at the end of the component name to select multiple components. For example, EM/NODE47 SHELF CARD/* displays all cards on the shelf. Enter "*" when you want a multiple component display, since context supplies only single component names. If your Passport version supports it, you can also use component administration system (CAS) extended wildcarding. Substitute a wildcard character for a subcomponent within a component name. For example, EM/NODE47 FRUNI/* FRAMER displays information on all available FrameRelay UNI Framers.

  Note: Do not target too many components using extended wildcarding since this negatively impacts the performance of both the Passport node and the workstation.

- If the component instances are sequential, type the first and last numbers in the range, separated by dots (for example, to select instances 2, 3, 4, and 5, type EM/MUNICH SHELF CARD/2..5).

  Use the wildcard only for the lowest component type in the component name. For example, EM/MUNICH SHELF CARD/*

- Type the number of each component instance to be polled. Use a semi-colon to separate each component instance from the next (for example, EM/MUNICH CARD SHELF/2;4;5).

  Use the wildcard only for the lowest component type in the component name. For example, EM/MUNICH SHELF CARD/*

The following procedure explains how to collect performance information for multiple components. If you start the Data Viewer from within another fault management tool by clicking an object, the device type and name, and the component name for the object, appear in the **Data Viewer** window at start-up. In this case, begin at step 4 of this procedure.

Otherwise, begin at step 1.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

1. In the **Device Type** field of the **Data Viewer** window, select the device type EM from the pull-down list.
2. In the **Device Name** field, enter the device name. A list of Passport device names appears in the Device Name field. You can also click the down arrow of the **Device Type** field to scroll to the device name.

   The **Authenticate** dialog opens.
3. Use the arrow to select the following information:
   - **Group**
   - **Userid**
   - **Password**
4. Click **OK**.

   A list of device names associated with the device appears in the **Component** field of the **Data Viewer** window.

   Note: If the authentication fails, repeat step 2.

   A list of device names associated with the device appears in the **Component** field of the **Data Viewer** window.

5 Select the components to monitor.

Do one of the following:

Click the down arrow at the right of the **Component** field to scroll to the component name.

Type the component name in the **Component** field.

The fully defined component name appears in the **Component** field. There can be multiple component levels in the fully defined component name, for example, EM/MUNICH SHELF CARD/1;3.

A forward slash after a component name indicates that there are multiple instances of that component. You must specify the instance for each of these components.

a. If a forward slash appears after a component name, type the number of the component after the slash.

Pressing the right arrow on the keyboard moves the cursor to the next component that requires a component number.

b. Specify the multiple component instances to monitor by entering their values after the lowest level component in the **Component** field.

For guidelines on entering multiple component numbers see “Collecting performance information for multiple components for Passport devices” (page 72).

c. Press Enter.

The message area at the bottom of the **Data Viewer** window displays status information on device and component connection. When connection is successful, a message in the status line indicates that the metric list was received.

6 In the **Max Components** field, enter the maximum number of components to monitor. You must enter a number in this field if you entered the wildcard (*) or a range of sequential component numbers in the **Component** field.

The metrics that are available for the selected components appear in the **Available Metrics** list. You can add new metrics for the components if required. For information on adding metrics see “Applicable to replay mode” (page 32).

7 Enter the number of seconds for gathering data.

The polling interval default setting is 60 seconds. You can choose an interval between 10 and 600 seconds (10 minutes).

CAUTION:
Selecting a low polling interval can flood the network and affect its performance.

8 In the **Number of Polls** field, type a number if you wish to limit the number of times data is collected.

Polling stops when the number of polls reaches the Number of Polls value.

If you do not enter a number in this field, data collection continues until you click **Pause** or **Stop**, or **File** -> **Exit** from Data Viewer.

9 In the **Available Metrics** list, select the metrics to poll:

a. Click a metric name in the **Available Metrics** list.

b. Click **Select** to move the selected metric to the **Selected Metrics** list.

You can click **Remove** to remove metrics from the **Selected Metrics** list.

Note: For a metric description, select the metric, and then right-click to display **Help.** A dialog displays the selected metric's description.

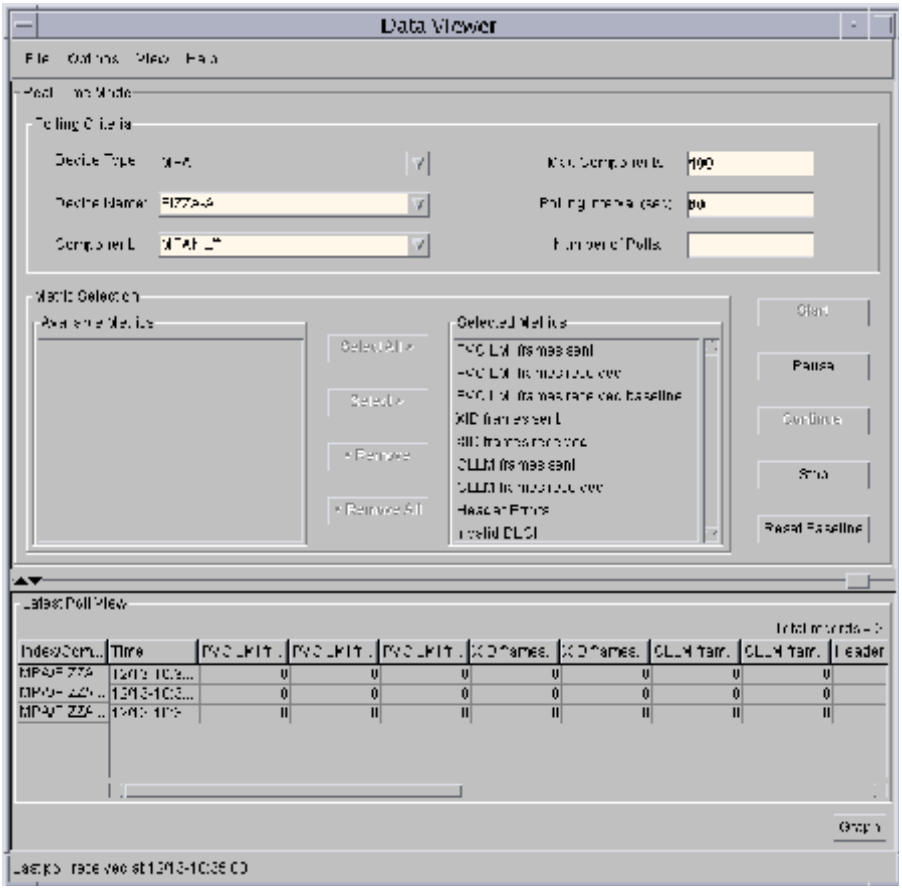
10 Click **Start** to begin data collection.

Incoming data appears in the data panel area in the lower half of the **Data Viewer** window. A delay equal to the number of seconds in the polling interval can occur before data starts arriving.

You can change the order of the columns in the data panel area and sort the values for each metric in ascending order. See "Rearranging data display" (page 108).

You can change the view from the **View** menu.

You can view detailed performance information about each component you are monitoring. See "Viewing summary and detailed performance information" (page 109).



This sample screen displays information about multiple components. The **Data Viewer** used a polling interval of 60 seconds.

Controlling data collection

The metric selection area of the **Data Viewer** window contains buttons to control data collection.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

- To begin polling metrics for the specified component(s) using the current polling selections click **Start**.
- To suspend data collection click **Pause**.
- To resume data collection click **Continue**.
- To stop polling metrics for the specified component(s) using the current polling selections click **Stop**. If you wish to restart polling using the same settings, click **Start**.

Writing component information to a Data Viewer Saved Statistics file

You can record data files, and then write the component information to a Data Viewer Saved Statistics file for future reference.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

1 From the **File** menu, select **Start Recording**.

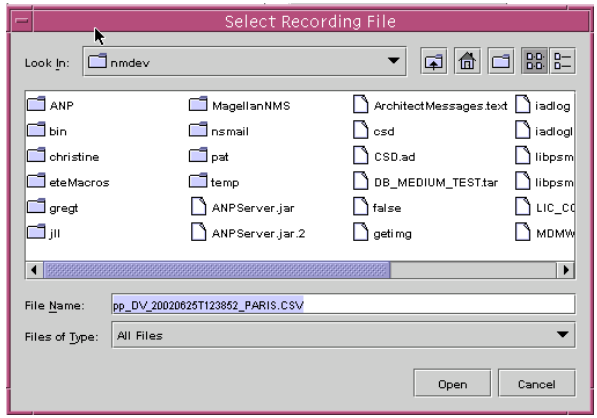
The **Data Recording Options** dialog opens.

2 Select one of the following options:

- **Record All Available Data** saves the metric data that the Data Viewer collects during the next and subsequent polling intervals
- **Record Starting Now** saves all the data the Data Viewer has collected since start-up

3 Click **OK**.

The **Select Recording File** dialog opens.



4 Select an existing file name or enter a new name for the Data Viewer Saved Statistics file. The Data Viewer tool provides the default file name.

5 If you enter a new file name, select **Open**.

The Data Viewer opens a Data Viewer Saved Statistics file with the name you enter and writes the performance information to it. The Data Viewer Saved Statistics file is updated as more information is received.

6 If you select an existing file name, a dialog opens. Select an option in the dialog:

- Select **Continue** to add a new performance information to the Data Viewer Saved Statistics file.

All information already in the file is retained.

- Select **Cancel** *to select another file name or to create a new Data Viewer Saved Statistics file.*

The **Open** dialog opens. You can enter the file name you want to open.

7 From the **File** menu select **Stop Recording** to stop logging.

Output to the Data Viewer Saved Statistics file stops and the file closes.

Viewing a Data Viewer Saved Statistics file

After you save the component information to the Data Viewer Saved Statistics file, you can view it.

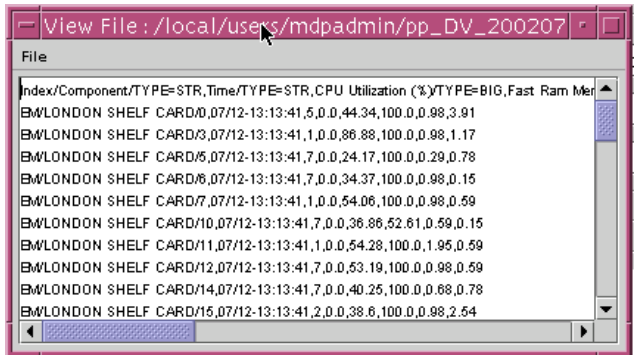
Prerequisites

The Data Viewer must be in real-time mode.

Procedure steps

1 From the **File** menu, select **View Recording**.

The **View File** window opens.



If a Data Viewer Saved Statistics file is open, the name of the open Data Viewer Saved Statistics file appears in the window. You can view this Data Viewer Saved Statistics file or change the file name to view a different Data Viewer Saved Statistics file.

2 To view a different Data Viewer Saved Statistics file, from the **File** sub menu, select **Load file**.

The **Open** dialog opens.

3 Select a Data Viewer Saved Statistics file to view.

The Data Viewer Saved Statistics file appears in the **View File** window. If you choose to view the current Data Viewer Saved Statistics file, new data will continue to be written to the file as they are received.

4 To close the Data Viewer Saved Statistics file and the **View File** window, select **File** -> **Exit**.

Stopping data recording

You can stop the recording of data after you have started.

Prerequisites

The Data Viewer must be in real-time mode.

Procedure

1 From the **Data Viewer** window, select **File** -> **Stop Recording**.

Integrating an SNMP device type

To integrate a new Simple Network Management Network Protocol (SNMP) device to the Data Viewer, you need to do one of the following:

- edit an existing metric file
- create a new metric file and revise configuration files

To revise an existing metric file, see "Updating an existing metric file for SNMP and Passport devices" (page 93). To create a new metric file, use the following procedures:

- "Creating a new metric file for SNMP devices" (page 83)
- "Updating the Data Viewer agent map file" (page 92)
- "Updating the PMDCD configuration file" (page 87)
- "Updating the Data Viewer client configuration file" (page 88)

Creating a new metric file for SNMP devices

Use the following procedure to create a new metric file for an SNMP device type. For details about the required elements and format of the metric file, see "Metric file format" (page 271).

Procedure steps

1 Log on as root.

2 Access the appropriate directory for creating a new metric file:

```
cd /opt/MagellanNMS/cfg/pmr
```

3 Using a UNIX editor, open a new file for editing. The subsequent steps in this procedure specify the required entries that you need to add to create a metric file.

4 Define the beginning of the metric file:

```
<METRICFILE>
```

5 Define a component:

```
<COMPONENT NAME = "<component name>">
```

Note: Use the symbol | after the component name to indicate if an instance is required.

6 If the component requires an IP address separate from the device itself, type the following entry. Otherwise, go to the next step.

```
<SEPARATE_IP/>
```

7 If the component requires mapping a component instance in the component name to a different value, type the following entry. Otherwise, go to the next step.

```
<MAP NAME = "<name>"
     VALUE = "DEC(<offset>)">
</MAP>
```

8 Define the metric element:

```
<METRIC NAME = "<metric name>"
```

Note: Do not use an equal sign "=" in the <metric name>; it may cause parsing errors.

9 Specify whether or not the metric is to be polled by default by specifying one of the POLLBYDEFAULT options.

```
POLLBYDEFAULT = "<yes|no>"
```

10 If required, specify a threshold value for the metric.

```
THRESHOLD = "<value>"
```

11 Define the METRIC STACK attribute:

```
STACK = "<stack elements>"
```

For more information on stack elements, see “Metric file format” (page 271).

12 If required, specify the metric index.

```
INDEX = "<index elements>"
```

For more information on index elements, see “Metric file format” (page 271).

13 Define the end of the METRIC element tag:

```
</METRIC>
```

14 If required, define additional metric elements by repeating step 8 to step 13.

15 Define the end of the COMPONENT element tag:

```
</COMPONENT>
```

16 If required, define additional component elements by repeating step 5 to step 15.

17 Define the end of the METRICFILE element tag:

```
</METRICFILE>
```

18 Add an optional description to the METRIC component in the metric file using the CDATA label. For example

```
<METRIC NAME="Tx Cells From Baseline"
POLLBYDEFAULT="yes"
STACK="(txCell/NUM)BASELINEDELTA">
<![CDATA[Discarded packets with priority 0 from
interface since the last baseline reset.]]>

</METRIC>
```

Note: Do not use a @ or ^ in CDATA. These characters may cause parsing errors.

The CDATA section is optional. Any metric without the CDATA section will be used by Data Viewer; however, Data Viewer will show a dialog with the message, “The description for this metric is not available from the metric file.”

Note: The only non-printable character allowed is ‘\n’.

19 Save and close the file.

Change the file permissions to allow read access by the group and others, and read-write access by the owner.

```
chmod 664 <file name>
```

Variable definitions

Variable	Definition
<component name>	is the name of the component to define
<SEPARATE_IP/>	specifies that the IP address is separate from the device
<name>	is the component instance in the component name
<offset>	is an integer or single alphabetic character (A to Z) used to decrement the component instance
<metric name>	is the name of the metric
<value>	is the threshold value
<stack elements>	specifies the attributes to be polled and their calculations
<index elements>	specifies the index of the attributes in the stack
<file name>	is the name of the metric file used in step 3

Updating the Data Viewer agent map file

Data Viewer clients open sessions with the Data Viewer agent. The agent connects to the corresponding Preside Multiservice Data Manager (MDM) servers. Once connected to the servers, the agent provides information to the graphic user interface (GUI).

For information about the Data Viewer agent map file (pmrtype.map), see 241-6001-310 *Preside MDM Server Reference Guide*.

Procedure steps

1. Copy the pmrtype.map file from the directory /opt/MagellanNMS/lib/cfg/pmr to the directory /opt/MagellenNMS/cfg/pmr.
2. Using a UNIX editor, open the file pmrtype.map.
3. Specify the device type and the name of the metric file.

   <device type>:<metric file with full path name>:PMDCD

4. Save and close the file.

Updating the PMDCD configuration file

The Data Viewer data collection daemon lets you collect and display real-time performance information for Simple Network Management Protocol (SNMP) devices in the network.

For information about the PMDCD configuration file (pmdcd.cfg), see 241-6001-310 *Preside MDM Server Reference Guide*.

Procedure steps

1. Copy the pmdcd.cfg file from the directory /opt/MagellanNMS/lib/cfg/pmr to the directory /opt/MagellenNMS/cfg/pmr.
2. Using a UNIX editor, open the file pmdcd.cfg.
3. Add the device type and sysName OID:

   `sysName:<device type>:<sysName OID>`
4. Save the changes and close the file.

Updating the Data Viewer client configuration file

Use this procedure to update the Data Viewer client configuration file.

Procedure steps

1 Modify the file /opt/MagellanNMS/cfg/DataViewerResources.cfg.

1 Make the modifications to the MIBS MIB block between the BEGIN and END statements:

a. If you add a new device type, then add the following information:

<device prefix>="<MIB files>"

b. If you change the MIB files for an existing device type, then find the <device prefix> associated with the device type and replace the MIB file names.

Variable definitions

Variable	Definition
<device prefix>	is a valid prefix for the new device
<MIB files>	are the full path names of the MIB files for the device

Integrating a Passport device type

To integrate a new Passport device to the Data Viewer, you need to do one of the following:

- edit an existing metric file
- create a new metric file and revise configuration files

To revise an existing metric file, see "Updating an existing metric file for SNMP and Passport devices" (page 93). To create a new metric file, use the following procedures:

- "Creating a new metric file for Passport devices" (page 89)
- "Updating the Data Viewer agent map file" (page 92)

Creating a new metric file for Passport devices

Use the following procedure to create a new metric file for a Passport device type. For details about the required elements and format of the metric file, see "Metric file format" (page 271).

Procedure steps

1 Log on as root.

2 Access one of the following directories for creating a new metric file:

```
cd /opt/MagellanNMS/cfg/pmr
```

```
cd /opt/MagellanNMS/ext/lib/cfg/pmr
```

3 Using a UNIX editor, open a new file for editing. The subsequent steps in this procedure specify the required entries that you need to add to create a metric file.

4 Define the beginning of the metric file:

```
<METRICFILE>
```

Note: Use the PPtype as the name of the map file to uniquely identify a map file. For example, the map file for a GPRS device should be GPRS.map.

5 Define a component:

```
<COMPONENT NAME = "component name">
```

Note: Use the symbol | after the component name to indicate if an instance is required.

6 Define the metric element:

```
<METRIC NAME = "<metric name>"
```

Note: Do not use an equal sign "=" in the <metric name>; it may cause parsing errors.

7 Specify whether or not the metric is to be polled by default by specifying one of the POLLBYDEFAULT options.

```
POLLBYDEFAULT = "<yes|no>"
```

8 If required, specify a threshold value for the metric.

```
THRESHOLD = "<value>"
```

9 Define the METRIC STACK attribute:

```
STACK = "<stack elements>"
```

10 Define the end of the METRIC element tag:

```
</METRIC>
```

11 If required, define additional metric elements by repeating step 8 to step 13.

12 Define the end of the COMPONENT element tag:

```
</COMPONENT>
```

13 If required, define additional component elements by repeating step 5 to step 15.

14 Define the end of the METRICFILE element tag:

```
</METRICFILE>
```

15 Add an optional description to the METRIC component in the metric file using the CDATA label. For example

```
<METRIC NAME="Tx Cells From Baseline"
POLLBYDEFAULT="yes"
STACK="(txCell/NUM)BASELINEDELTA">
<![CDATA[Discarded packets with priority 0 from
interface since the last baseline reset.]]>

</METRIC>
```

Note: Do not use a @ or ^ in CDATA. These characters may cause parsing errors.

The CDATA section is optional. Any metric without the CDATA section will be used by Data Viewer; however, Data Viewer will show a dialog with the message, “The description for this metric is not available from the metric file.”

Note: The only non-printable character allowed is ‘\n’.

16 Save and close the file.

17 Change the file permissions to allow read access by the group and others, and read-write access by the owner.

```
chmod 664 <file name>
```

Variable definitions

Variable	Definition
<component name>	is the name of the component to define
<MIB files>	are the full path names of the MIB files for the device
<metric name>	is the name of the metric
<threshold value>	is the threshold value
<stack elements>	specifies the attributes to be polled and their calculations
<file name>	is the name of the metric file used in step 3

Updating the Data Viewer agent map file

For information about the Data Viewer agent map file (pmrtype.map), see 241-6001-310 *Preside MDM Server Reference Guide*.

1. Copy the pmrtype.map file from the directory /opt/MagellanNMS/lib/cfg/pmr to the directory /opt/MagellenNMS/cfg/pmr.
2. Using a UNIX editor, open the file pmrtype.map.
3. Specify the device type and the name of the metric file.

   <device type>:<metric file with full path name>:<Passport device>.map

   For example, EM:/opt/MagellanNMS/cfg/prm/myMetric:GPRS.map.
4. Save and close the file.

Updating an existing metric file for SNMP and Passport devices

Use this procedure to update an existing metric file for SNMP and Passport devices.

Procedure steps

1. Copy the default metric file from one of the following directories:
   - /opt/MagellanNMS/lib/cfg/pmr
   - /opt/MagellanNMS/ext/lib/cfg/pmr

   It is recommended that you copy the metric files to the directory /opt/MagellanNMS/cfg/pmr.
2. Modify the metric file in the directory /opt/MagellanNMS/cfg/pmr, maintaining the format requirements specified in “Metric file format” (page 271).
3. Save the changes and close the file.

   Note 1: Use a different map file other than the default pmrtype.map file to contain the modified map information for the device type.

   Note 2: Use the device type or PPtype (for Passport) as the map file name to uniquely identify the file.
4. Copy the pmrtype.map from the directory /opt/MagellanNMS/lib/cfg/pmr or /opt/MagellanNMS/lib/cfg/pmr to the directory /opt/MagellanNMS/cfg/prm.
5. Using a UNIX editor, open the file pmrtype.map.
6. Modify the path name of the metric file associated with the device type.
7. Save the changes and close the file.

Procedures for replay mode

Getting started

Replaying data files

Working with collected data

Starting the Data Viewer from the Preside MDM window in replay mode

This section describes how to start the Data Viewer in replay mode from the Preside MDM window. You can analyze collected data at a later date in this mode.

Procedure

1 In the **Preside MDM** window, select **Accounting** -> **Data Viewer**.

The **Data Viewer** window opens. The default is replay mode and spreadsheet view.

Replaying data files on a local workstation

After you record data files, you can replay BDF, Data Viewer Saved Statistics, Streamed Passport Statistics, Statistical Retrieval System files on a local workstation. The default record description files (RDF) are used to decode bulk data format (BDF) files. Data Viewer locates the default RDF when it is launched in replay mode. Data Viewer may not display BDF files correctly if changes are made to RDF or BDF files after the tool is launched. Use the **Select RDF** option to select the corresponding RDF for the BDF files.

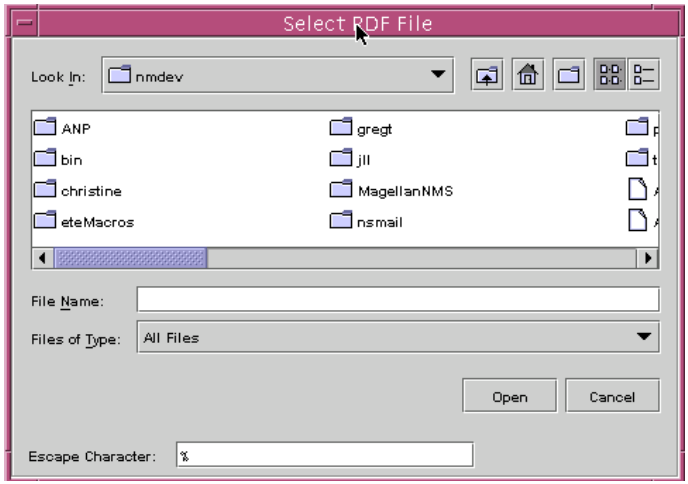
Note: If the BDF files are recorded using an older version of RDF files and the data record does not contain the RDF version, you must begin this procedure at step 1. See 241-6001-309 *Preside MDM Management Data Provider User Guide* for information on managing BDF data, and customizing RDF data records.

Procedure steps

1 Use the default RDF or select an RDF. If you want to use the default RDF, go to step 3. Otherwise, continue with this step.

From the **Options** menu, choose **Select RDF**.

The **Select RDF File** dialog opens.



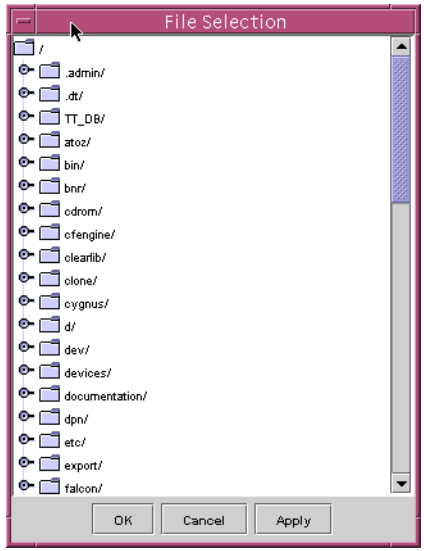
2 Select the RDF file and click **Open**.

3 If required, select one or more the following:

- **Data Type**
- **Device Type**
- **Device Name**
- **Start Date**
- **End Date**

4 Click **Retrieve Files** to add data files.

The **File Selection** dialog opens.



5 Select the file(s) from the **File Selection** dialog by one of the following methods:

To select a single file

- Click the mouse on a file name and click **OK**. The file is added to the **Files Selected** area of the **Data Viewer** window and the **File Selection** dialog closes.

- Click the mouse on a file name and click **Apply**. The file is added to the **Files Selected** area of the **Data Viewer** window and the **File Selection** dialog remains open.

To select a range of files

- Click the mouse on the first file name, press shift and click the mouse on the last file name and click **OK** or **Apply** to confirm your selections.

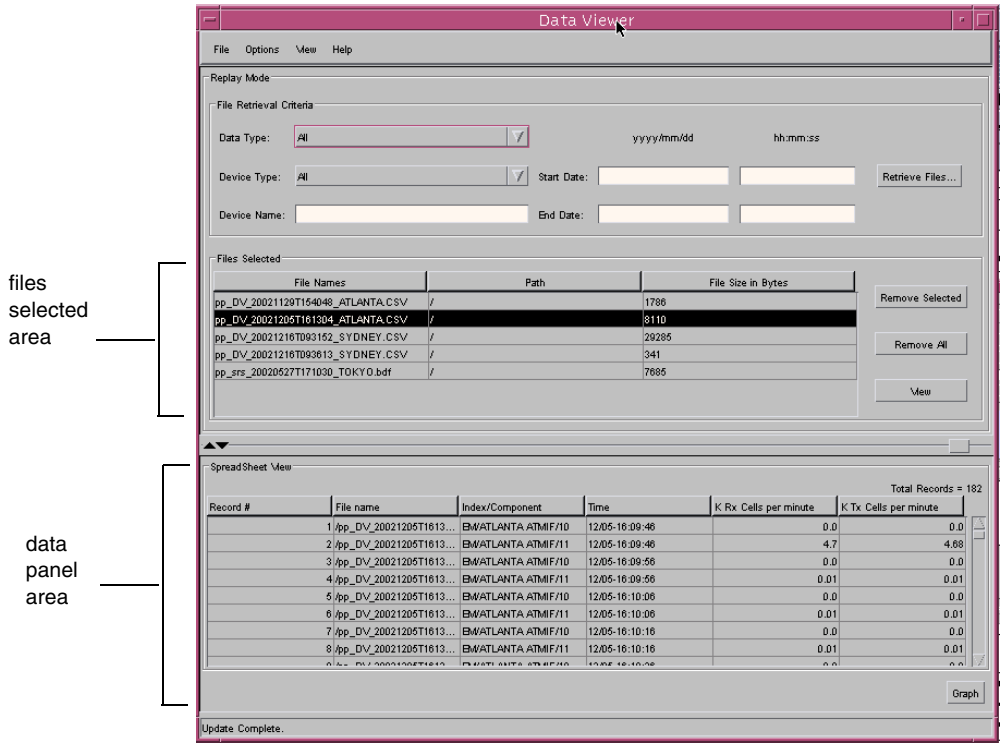
To select multiple files

- Press control, and click the mouse on multiple file names and click the **OK** or **Apply** to confirm your selections.

The file(s) appear in the **Files Selected** area.

6 To view multiple files with the same data type, select a file and click **View**.

The files appear in the data panel area.



7 If required, from the **View** menu, select a different view.

Replaying data files on a remote workstation

After you record data files, you can replay the files on a remote workstation.Record description files (RDF) are used to decode bulk data format (BDF) files. The Data Viewer selects the appropriate RDF by reading the first two fields of a BDF data file record. These fields are switch type (pp, dpn, vss, or gen) and data type (acc, sta, ala, log, scn, otg, or ava).

Note: If the RDF for the selected BDF file(s) was customized after the BDF records were created, the results displayed with this application may not be accurate.

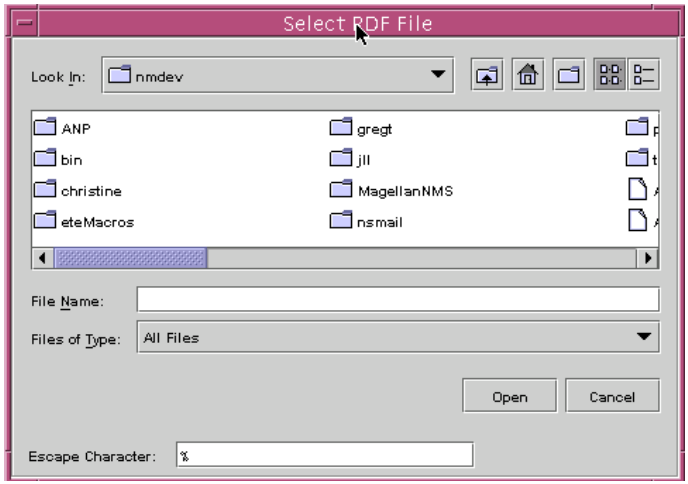
Procedure steps

1 Access the files by a file system mount or FTP the files to the local workstation.

2 Verify that both record description file (RDF) and bulk data file (BDF) exist.

3 From the **Options** menu, choose **Select RDF**.

The **Select RDF File** dialog opens.



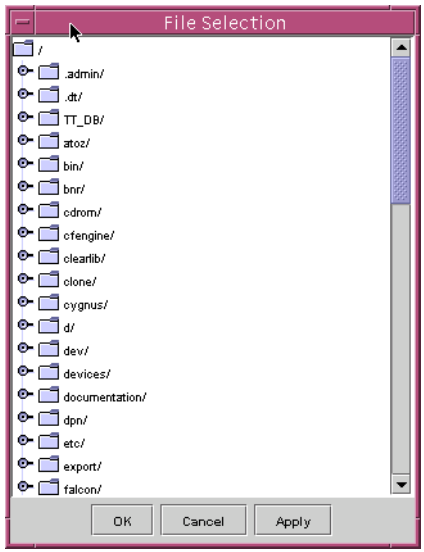
4 Select the RDF file and click **Open**.

5 If required, select one or more the following:

- **Data Type**
- **Device Type**
- **Device Name**
- **Start Date**
- **End Date**

6 Click **Retrieve Files** to add data files.

The **File Selection** dialog opens.



7 Select the file(s) from the **File Selection** dialog by one of the following methods:

To select a single file

- Click the mouse on a file name and click **OK**. The file is added to the **Files Selected** area of the **Data Viewer** window and the **File Selection** dialog closes.
- Click the mouse on a file name and click **Apply**. The file is added to the **Files Selected** area of the **Data Viewer** window and the **File Selection** dialog remains open.

To select a range of files

- Click the mouse on the first file name, press shift and click the mouse on the last file name and click **OK** or **Apply** to confirm your selections.

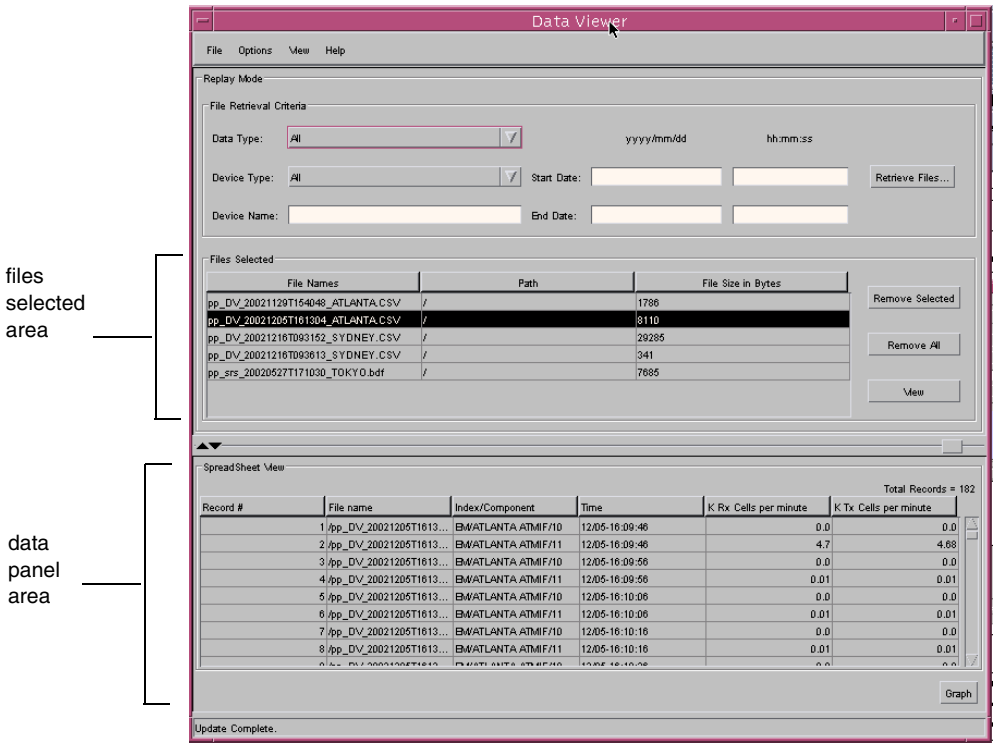
To select multiple files

- Press control and click the mouse on multiple file names and click the **OK** or **Apply** to confirm your selections.

The file(s) appear in the **Files Selected** area.

8 To view the files, select a file and click **View**.

The files appear in the data panel area.



9 If required, from the **View** menu, select a different view.

Retrieving files

Retrieving files lets you analyze performance information at a later date. The retrieved files are displayed in the **Files Selected** area.

Prerequisites

The Data Viewer must be in replay mode.

Procedure steps

1 In the **File Retrieval** section of the **Data Viewer** window, select a **Data Type** from the pull-down menu, if required:

- **Data Type**
  Accounting, Alarm, All (default)**, Availability, Data Viewer Saved Statistics, Log, Outage, SRS, Scn, Statistics, Streamed Passport Statistics**

2 If required, select a **Device Type** from the pull-down menu:

- **Device Type**
  All (default)**, DPN, Others, Passport**

3 If required, in the **Device Name** field, type the device.

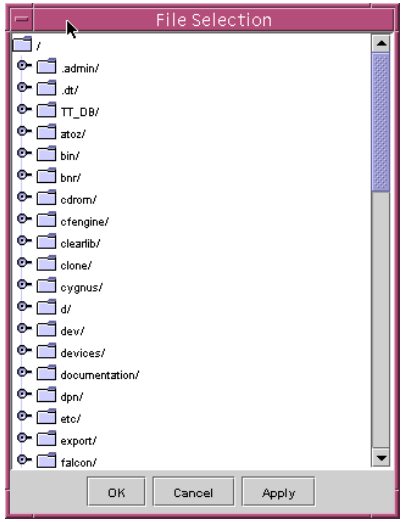
- specify <nodename | nodeid> for Accounting, Alarm, Scn, Log, Statistics and Outage data types
- device name has no impact on Availability type
- specify <nodename> for SRS and Data Viewer Saved Statistics data types
- specify <Passport-groupname> in Streamed Passport statistics data type

4 If required, specify the **Start Date** and End Date:

- **Start Date** lets you specify a range of the start date (yyyy/mm/dd) and time (hh:mm:ss) of the filename to be filtered. Any files with the start date and time larger than the Start Date are selected.
- **End Date** lets you specify a range of the end date (yyyy/mm/dd) and time (hh:mm:ss) of the filename to be filtered. Any files with the end date and time smaller than the End Date are selected.

5 Click **Retrieve Files**.

The **File Selection** dialog opens.



6 Select the file(s) from the **File Selection** dialog by one of the following methods:

To select a single file

- Double-click the left mouse on a file name. The file is added to the **Files Selected** area of the **Data Viewer** window and the **File Selection** dialog closes.
- Click the left mouse on a file name and click **OK**. The file is added to the **Files Selected** area of the **Data Viewer** window and the **File Selection** dialog closes.
- Click the left mouse on a file name and click **Apply**. The file is added to the **Files Selected** area of the **BDF Viewer** window and the **File Selection** dialog remains open.

To select a range of files

- Click the left mouse on the first file name, press shift-left mouse on the last file name and click **OK** or **Apply** to confirm your selections.

To select multiple files

- Press control-left mouse on multiple file names and click the **OK** or **Apply** to confirm your selections.

The file(s) appear in the **Files Selected** area.

Viewing files in the Files Selected area

Once the files are displayed in the Files Selected area, you can view them in more detail.

Prerequisites

The Data Viewer must be in replay mode.

Procedure steps

1 Select the file(s) to view from the **Files Selected** area by one of the following methods:

To select a single file

- Click the left mouse on a file name.

To select a range of files

- Click the left mouse on the first file name, and press shift-left mouse on the last file name.

To select multiple files

- Press control-left mouse on each file name.

2 Click **View**.

The **Progress Information** dialog flashes on the screen briefly, depending on the size of the files. The files are displayed in the Data Panel area of the Data Viewer window.

Removing files from the Files Selected area

After you analyze data files, you may wish to remove one or more files.

Prerequisites

The Data Viewer must be in replay mode.

Procedure steps

1 From the **Files Selected** area, select the file(s) by one of the following methods:

To select a single file

- Click the left mouse on a file name.

To select a range of files

- Click the left mouse on the first file name, and press shift-left mouse on the last file name.

To select multiple files

- Press control-left mouse on each file name
- The selected files in the **Files Selected** area are highlighted.

2 Click **Remove Selected**.

3 The **Files Selected** area is refreshed without the removed files.

Removing all files from the Files Selected area

After you analyze data files, you may wish to remove all files.

Prerequisites

The Data Viewer must be in replay mode.

Procedure

1 From the **Files Selected** area, click **Remove All**.

The **Files Selected** area is refreshed without any file names being displayed.

Procedures for real-time and replay modes

Getting started

Controlling the display of performance information

Viewing performance information

Starting the Data Viewer from the command line

You can start the Data Viewer in real-time mode or replay mode from the command line.

Procedure steps

1 From the UNIX prompt, type

```
/opt/MagellanNMS/bin/dataviewer -mode
<REALTIME|REPLAY>
```

Variable definitions

Variable	Definition
<REALTIME|REPLAY>	the mode in which the tool is launched. Specifying REALTIME launches the Data Viewer tool in real-time mode. REPLAY launches the tool in replay mode. If you do not specify the mode, the Data Viewer is launched in real-time mode.

Exiting the Data Viewer

Use this procedure to exit the Data Viewer.

Procedure steps

1 From the **File** menu, select **Exit**

When you exit from the Data Viewer, all open windows close and history for the session is discarded.

Rearranging data display

You can sort the values and change the order of the data columns. The **Data Viewer** displays metric values in two locations:

- Data panel area in the lower half of the Data Viewer window
- Summary and detailed statistics tables for a specified statistic in the views area (real-time mode only)

Procedure steps

1. To change the order of the columns, select each column header and drag it to its new position.
2. To sort the values for a metric in ascending order, right click in the column header for the metric.

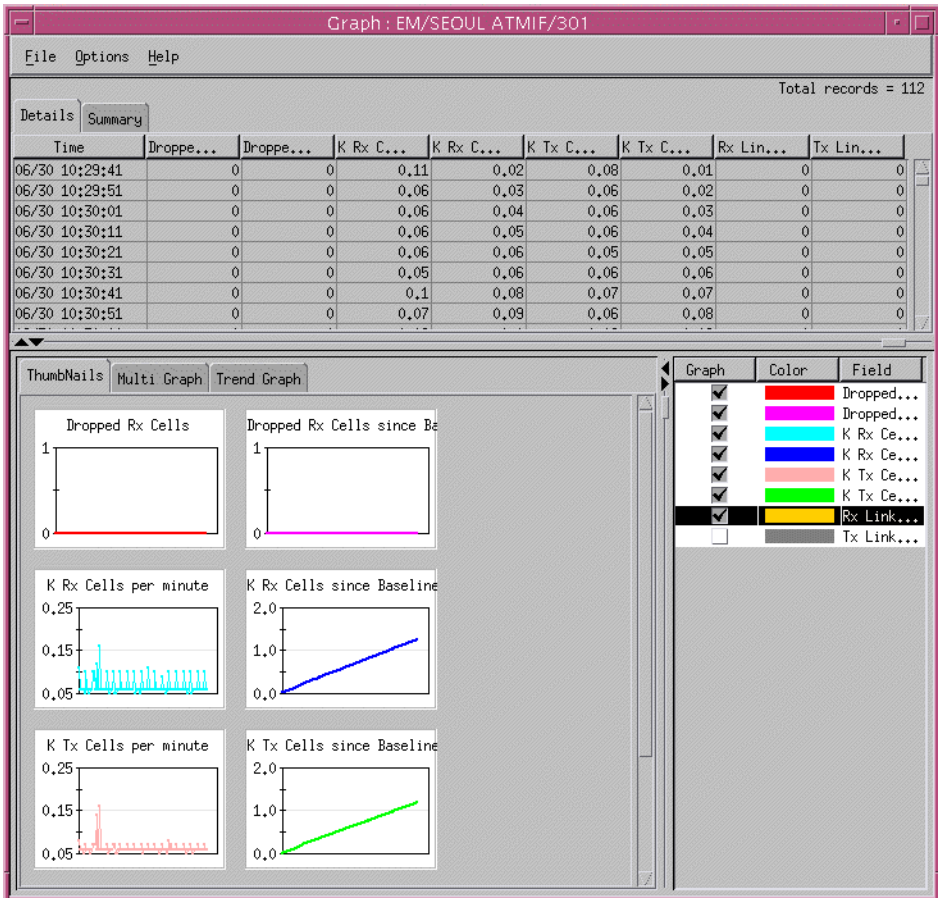
Viewing summary and detailed performance information

The Data Viewer lets you view detailed and summary information collected for each component. The information is displayed in the **Graph** window, in both table and graphic formats.

Procedure steps

1. In the data panel area, click in the component row.
2. Click **Graph**.

The **Graph** window opens. You can launch multiple versions of the **Graph** window, one for each component you are monitoring. See “Managing the graphical display” (page 112).



This sample screen displays detailed information about one component.

3 View detailed or summary information by doing one of the following:

- Click the **Detail** tab to view detailed information.
- Click the **Summary** tab to view summary information.

4 If you wish to change the color assigned to a metric, complete the following:

   a. From the graph selection table, click the color bar for the metric in the statistics table.

   The **Pick a Color** window appears. This window provides options and sample displays to let you select or mix a new color for the metric.

   b. Choose a new color for the metric.

   c. Click **OK** to set the color.

   The new color appears in the **Color** column of the graph selection table and in any existing graphs in which the metric is used. For more information on graphs see “Managing the graphical display” (page 112).

5 To exit from the Data Viewer tool, select **File** -> **Exit**.

Managing the graphical display

You can specify performance data to view in thumbnails, multi graphs or trend graphs, and in line or bar graph format.

Procedure steps

1 In the **Graph** window, click the checkboxes in the graph selection table to select the metrics to graph.

The Data Viewer plots the data collected for the selected metrics and displays it in the graph area. Only the metrics that you select in the graph selection table appear in the graph.

The color of each line or bar in the graph matches the color assigned to the metric in the detailed statistics table. The x axis of the graph shows the time each set of data was collected.

The endpoint of the graph line represents the latest performance data collected. The data and the graph are updated according to the polling interval you select in the **Data Viewer** window.

2 To view a different type of graph, do one of the following:

- Click the **ThumbNails**, the **Multi Graphs** or the **Trend Graphs** tab in the graph area.
- From the **Options** menu, select **Line** or **Bar**.

Note: For thumbnail graphs, you can also change the display by clicking the right mouse button on the Thumbnail graph. A context menu with Range setting (Default) or Range setting (Customized) is displayed. Click on the context menu and the **Customize Display Range** dialog opens. Change the minimum and maximum display values, and click OK.

3 To clear the graphs and display new data, deselect the graph box in the graph selection table.

Any graphs selected in the graph selection table are cleared.

Chapter 4
DPN Performance Viewer

This section describes the DPN Performance Viewer and provides you with instructions on how to use this tool. The following information is included:

DPN Performance Viewer overview

The DPN Performance Viewer (Performance Viewer) collects and displays performance information about DPN network components. Use the DPN Performance Viewer tool to

- help trace faults in the network
- collect information about network load
- generate statistics for reporting and analytical purposes

The DPN Performance Viewer collects statistics on the status of components called metrics. You select the metrics you want to view, choosing a text or graphic format. Component information is obtained in real-time over short

periods. The display varies according to the type of component(s) you are monitoring. You can write the information you collect to an ASCII log file for later analysis or processing.

The DPN Performance Viewer collects attributes from DPN network components using the General Management Data Router (GMDR) server. The DPN Performance Viewer uses these attributes to derive more meaningful metric values. These values are displayed as a history in a graphical format.

For DPN metric details, see "DPN-100 metrics" (page 265).

For additional information on the DPN Performance Viewer, see

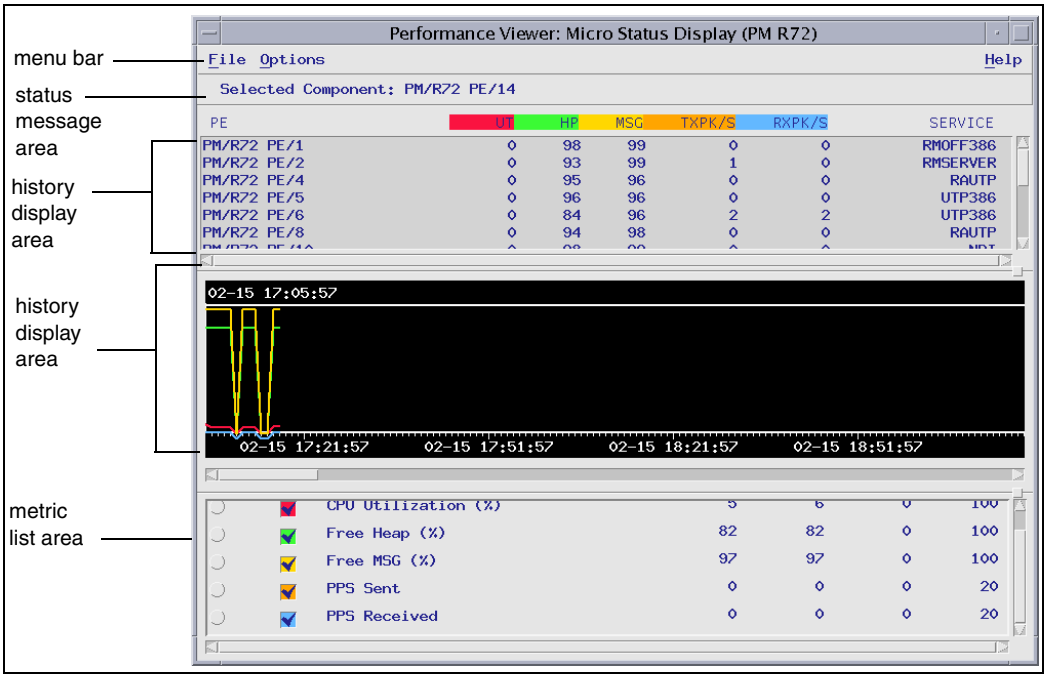
- "Performance Viewer window" (page 116)
- "DPN Performance Viewer dialogs" (page 121)
- "Keyboard shortcuts" (page 121)
- "Starting the DPN Performance Viewer" (page 129)
- "Displaying component information" (page 130)
- "Controlling the graphic display" (page 132)

Performance Viewer window

The Performance Viewer window contains three or four areas, depending on which component is being viewed. Except for the Menu Bar area, which is always visible, the other areas are separated by "window panes". Clicking and dragging the mouse over one of the window pane movement boxes lets you configure the relative size of each area; one area can fill the entire DPN Performance Viewer display.

See the figure "Performance Viewer window" (page 117) to view a sample Performance View window.

Figure 18
Performance Viewer window



When you first attempt to establish a connection to a network component, or subsequently use the **Change Parameters** command, there is a delay until a response is received from the GMDR. During this delay, the status line just below the menu bar displays a message, and the shape of the cursor turns into that of a clock. When a response is received, either as performance data or some kind of connection error, the status line turns blank and the cursor returns to its normal shape. A delay of about one minute occurs when the GMDR first connects to DPN networks.

See the following information:

- “File menu” (page 118)
- “Options menu” (page 119)
- “Help menu” (page 120)
- “Status message area” (page 120)

- "Shelf display area" (page 120)
- "History display area" (page 120)
- "Metric list area" (page 121)

File menu

The File menu contains commands for files, for the application as a whole, and for exiting the DPN Performance Viewer tool. The available commands include:

- **Log to File** opens a dialog that prompts you for a file name to save the complete visible metric history. If that filename already exists, it is overwritten.

  The file is placed in your home directory, unless you provide an absolute pathname.

  The file is updated every time more data is collected until you select the Stop Log menu option, exit the DPN Performance Viewer, or change to a different component. The DPN Performance Viewer always provides a graphic display, whether or not you direct output to a file at the same time.

  Although you can view a file in text form, it is normally processed by other applications (custom and future tools).

  The **Log to File** command is only available when no log is currently running.

- **Stop Log** stops output to the file and closes it.
- **View Log File** enables you to view an ASCII file in a text window. The last known log file name is used as a default file name;, however, you can change this after the **PV Log File Name** dialog opens. If the current log file is being viewed, new logs are written to it as they are received. The text window that you see is actually an xtail command. It contains a file name field near the top of the window that can be changed to a different file name You can view the file by clicking **Show**. The **Pause** button freezes output to the xtail session until you toggle it off.

- **Exit** leaves the DPN Performance Viewer. All windows associated with the session are removed from the workstation screen. However, if you invoke an xtail session using the **View Log File** command, it is not closed.

Options menu

The **Options** menu contains commands that let you customize the DPN Performance Viewer session.

- **Change Parameters** opens the **Performance Viewer Setup** dialog. This setup dialog allows you to change the refresh interval for retrieving metrics and to change the component being monitored.

  If you change the refresh interval, the DPN Performance Viewer remaps the metric history based on the new refresh interval. If you choose a larger refresh interval, the older graph history appears squeezed; if you choose a smaller refresh interval the older graph history appears stretched.

  Changing the refresh interval does not affect the log file. However, changing the component stops the log file and creates a new graph.

- **Reset History Graph** command applies when you work with a list of multiple components in the **Performance Viewer** window. This command toggles the reset function of the graph on or off. As a result, one of the following commands will be available:

  — **Reset History Graph On** resets the graph to the initial data collection time whenever you select another component from the list.

  — **Reset History Graph Off** retains the current position of the graph whenever you select another component from the list.

  — The active behavior of the graph is always opposite to the choice that is visible in the Options menu.

Help menu

The Help menu provides the following options:

- **Help on Context** provides help information about an object in the window. When you select this menu item, the cursor changes to a question mark. You can then move the cursor anywhere in the window and select an object in the window to get information about it. If you do not click on a specific object or if no specific help text is available for that object, general help for the application will be displayed.
- **Help on Help** contains information about how to use the help facility
- **Help on Window** provides descriptive help information about a window
- **Help on Keys** provides help information about keyboard shortcuts.

Status message area

The Status Message Area displays messages. For example, the message "Waiting for server response" is displayed during a connection attempt to a component.

When no warning message is being displayed, the Status Message Area shows which component is currently selected for viewing.

Shelf display area

The Shelf Display Area displays a list of DPN components. This list displays the name of the sub-components (omitting the module name) and the key metrics collected. You can view all the metrics in the history and metric list areas.

To select a component for viewing in the history and metric area, click the component in the list, or click the button below one of the cards or logical processors.

A DPN component displayed in orange means that it is out of service.

History display area

The History Display Area displays the history of metric values for a particular component using line graphs. Use the scrollbar at the bottom of the graph to scroll through the complete history of the current DPN Performance Viewer session. You can move the History Line to see values for specific times in the

graph. First, put the cursor in the History Display Area. Left click the mouse to move the History Line to the current cursor position. You can also use the left and right arrow keys to move the History Line in increments of one data point.

Metric list area

The Metric List Area lets you toggle particular metric displays on or off. It also gives information about the metric value, its value at a particular time in history (corresponding to the vertical white bar in the History Display Area), and its minimum and maximum possible values. Shaded buttons cannot be selected for display.

> ***Note:*** For some metrics, notably the "packets per second" types, the maximum value may increase depending on the history. This allows trunks of different speeds to be monitored in a meaningful way.

Clicking the **HiWater** button in the metric list area changes the history marker to that metric's high-water point. For information on the metrics, see "Customizing DPN Performance Viewer default settings" (page 135).

Keyboard shortcuts

The DPN Performance Viewer provides the following keyboard shortcuts:

- Ctrl+L invokes Log to File
- Ctrl+S invokes Stop Log
- Ctrl+V invokes View Log File
- Ctrl+E invokes Exit
- Ctrl+C invokes Change Parameters

DPN Performance Viewer dialogs

The DPN Performance Viewer provides the following dialogs:

Some DPN Performance Viewer dialogs have default action buttons. They are visually distinguished by an extra box around them. If you press the Return key anywhere in the dialog, Motif activates the default button.

Performance Viewer Setup dialog

The **Performance Viewer Setup** dialog lets you to specify the performance information you would like to display. This dialog appears when you start the DPN Performance Viewer for the first time, or when you change components or change the probing interval.

The following items appear in the dialog:

- **Refresh Interval (seconds)** sets the refresh interval (in seconds) used to gather data. The refresh interval has a default value of 300 seconds, which changes when you slide the bar or click to the left or right of the bar for more refined tuning. The refresh interval is a target value; depending on network speed, some data collection may take longer. The selectable range of the refresh interval is from 60 seconds to 600 seconds (10 minutes) for DPN devices.

  When you select a DPN display, you need to set the refresh interval equal to or greater than the largest Network Control System (NCS) status probe interval for the whole network. Failure to do this may result in components incorrectly being displayed as out-of-service.

  The initial refresh interval used for a DPN status display is 30 seconds, regardless of the setting for Refresh Interval. The initial short collection interval is used to quickly gather data as it becomes available. The short refresh interval is used only for the first full **Refresh Interval**. That is, 5 minutes of 30 second refreshes occur; after that, refreshes occur every 5 minutes.

- Radio buttons and component ID fields. The left side of the dialog is equipped with a number of radio buttons (**Micro Status**, **Net Link Status**, **Trunk Status**, **Gateway Status** and **Summary Status**) that allow you to select one type of performance information to display at a time.

  Each radio button is accompanied by a component ID field (**Module**, or **Dest Mem**) that becomes active when you click the radio button.

  You can type in the component ID, or you can retrieve the component name from context by clicking **Get Context**. For DPN, only a PM or destination mnemonic name is required. Multiple displays for DPN are inherent and not triggered by a wildcard. The destination mnemonic is similar to an OA name, but allows identification of primary or backup. Note that if the “PM”, or “OA” prefix is missing, it is prefixed automatically to the component specification.

  See “DPN-100 Metrics” (page 265).

- **Reauthenticate with CM** forces you to reauthenticate with the Connection Manager. This is useful when changing different components to different user privileges.
- **OK** starts DPN Performance Viewer. You need to specify a DPN component name in the component ID field.
- **Cancel** closes the **Setup** dialog. If the **Setup** dialog is presented as the result of starting the DPN Performance Viewer, then the Performance Viewer is not started. If the **Setup** dialog results from a **Change Parameters** command, only that change operation is canceled.

The **Performance Viewer Setup** dialog allows you to open the following types of DPN summary status displays by clicking the appropriate radio button:

- **Micro Status.** The format of the PM name is “PM/nodename”. Metrics: CPU Utilization (%), Free Heap (%), Free MSG (%), PPS Sent, PPS Received, PE Service.

  See also “Micro status” (page 265).

- **Net Link Summary Status.** An OA destination mnemonic must be supplied (for example, OA/name).
  Metrics: Netlink Utilization (%), Netlink Local Mnemonic, Netlink Remote Mnemonic.

  See “Net Link status” (page 266).

- **Trunk Status.** An OA destination mnemonic must be supplied (for example, OA/name).

  Note: NM trunk numbers are hexadecimal.
  Metrics: Trunk Utilization (%), Trunk Local Mnemonic, Trunk Remote Mnemonic.

  See “Trunk status” (page 267).

- **Gateway Status.** An OA destination mnemonic must be supplied (for example, OA/name).
  Metrics: Gateway Type, Gateway Call, Gateway Link Utilization (%), Gateway Pkt Sent, Gateway Pkt Received.

  See “Gateway status” (page 268).

- **Summary Status.** An OA destination mnemonic must be supplied (for example, OA/name).
  Metrics: Bus Utilization (%), Common MSG (%).

  See “Summary status” (page 269).

PV Log File Name Entry dialog

The **PV Log File Name Entry** dialog requests a file name. The name that you enter in the text portion of the dialog specifies the file in which the DPN Performance Viewer dumps metric log information.

If a log file has already been opened, its name appears in the dialog. You can change this name if you wish. The log begins when you click **Start Log**.

You may change the default directory by double clicking on a directory name, or by single clicking and clicking **Change Directory.**

The following commands are available in the **PV Log File Name Entry** dialog:

- **Log Entire History from Beginning** writes all performance metrics to the named file from the moment the DPN Performance Viewer is originally started. The default value is Off. If you do not select this button, the DPN Performance Viewer only writes performance metrics to file from the next refresh to whenever you select **Stop Log** from the **File** menu.
- **Start Log** opens a log file with the name specified in the selection text field. The dialog then closes.
- **Change Directory** changes the current directory to the one specified in the directories list.

PV Log View dialog

The **PV Log View** dialog displays the contents of the alarms as they are logged to a file.

The following commands are available from the **PV Log View** dialog:

- **Show** refreshes the contents of the dialog with the current content of the specified alarm file.
- **Pause** lets you pause the display of incoming alarms. When the display has been paused, a red border surrounds the alarm information and the label on the button changes to Resume. Clicking the Resume button removes the red border and resumes the dislay the incoming alarms.
- **Close** closes the dialog.

Warning and error dialogs

If any of the following warning or error dialogs appear, you need to take appropriate action.

PV Exit Warning dialog

Exiting the Performance Viewer finishes this session. Any log file in progress is saved and closed.

- **No, cancel exit** cancels the exit operation and returns to the Performance Viewer.

PV File Error dialog

A file operation error occurs on the log file. This happens when the specified ASCII log file is unwritable, perhaps because you do not have write permission to the directory, or because the file is already present but does not have write permission.

If a close file operation fails, the Performance Viewer assumes the log file is dead. You can start another log.

PV File Lock Error dialog

The specified file is locked. This results from another Performance Viewer currently using the named file for its log. You need to choose **Stop log** so that the DPN Performance Viewer can close the log file and unlock it.

If the file is not in use, maybe it is wrongly marked as locked. You need to delete a file called "<filename>.lock" located in the same directory as <filename>, probably in your home directory.

PV File Exists Warning dialog

The file you choose in which to dump the DPN Performance Viewer log, already exists. If you overwrite the file, you can lose any data it contains. If you do not wish to lose this file, click **No, keep the file, select Log to File**, and specify a different file name.

- **Yes**, delete the file starts a new log and overwrites the existing file.
- **No**, keep the file cancels the start log operation.

No Component Error dialog

The specified component name may be incorrect or not supported by the DPN Performance Viewer for viewing metrics. For example, a CARD component is supported, whereas a SHELF component is not. If you are certain that the component is supported, make sure that the component name is in correct syntax, and try again using the **Change Parameters** option. If it persists, see your system administrator.

PV IPC Error dialog

The DPN Performance Viewer fails to establish a connection to the interprocess communication server. You need to exit the DPN Performance Viewer. Start the process "mnsd" should be started before invoking the DPN Performance Viewer.

Prober Busy Warning dialog

The lower layer devices are too busy to respond to the probe request within the specified refresh interval. As a result, some probe cycles may have been skipped. Increase the refresh interval using the **Change Parameters** option.

Metric Database Error dialog

The target component does not have the specified probe attributes. Ensure that Nortel Networks checks your metric database.

Invalid Component Error dialog

The **Invalid Component Error** dialog is displayed for any of the following reasons:

- The specified component name is incorrect. Make sure the component name is in correct syntax and try again using the **Change Parameters** option. If the situation persists, see your system administrator.
- A component is missing, such as a card that does not exist, or a component is out of range.

Insufficient Authentication Error dialog

To access the networks to gather metrics, you need to have a certain level of security. This security is provided when the **CM** window is displayed and asks you to supply a group, id, and password.

This window may be forced up if you change the component (probably the same one you tried) and select the **Reauthenticate with CM** button in the setup dialog.

Device Error dialog

The specified component name does not exist in the current network view. Make sure the component name is correct and exists in the network view. You may try again using the **Change Parameters** option. If the situation persists, see your system administrator.

Device Timeout Error dialog

No response is available from the target component. Make sure the component is active and the X.25 connection to the network is not congested. You may try again using the **Change Parameters** option. If the situation persists, see your system administrator.

Prober Internal Error dialog

The **Prober Internal Error dialog** is displayed for any of the following reasons:

- The lower layer has errors. No more data may be displayed.
- Check the OAM Log Display for detailed error information about Generic Prober (GP), the GMDR, or Fdtr. Verify your system configuration for connection between Preside Multiservice Data Manager (MDM) and Passport.

  This error may be caused by the Passport component going down. Even when the component comes back up, probing does not take place unless you manually restart it using the **Change Parameters option.**

You can try to solve this by reconnecting the DPN Performance Viewer using the **Change Parameters** option. If this fails, log out and log back in; this restarts a probe. If the situation persists, see your system administrator.

Accumulator IPC Error

An attempt to connect to the server GMDR fails. Make sure that the server GMDR is running on the local workstation or the workstation you LAN select to.

Accumulator Lost Connection dialog

Communication with the server GMDR is severed. Make sure the server GMDR is running on the local workstation or the workstation you LAN select to.

Invalid Module Name or Destination Mnemonic dialog

The specified destination mnemonic or module name is not reporting status records. Make sure the connection from Preside Multiservice Data Manager (MDM) to the OA or from the OA to the reporting module is up. You may try again using the **Change Parameters** option. If the persists, see your system administrator.

Make sure the specified PM or destination mnemonic exists within the network view.

Note: A refresh interval that is set too short may also cause this error. Make sure the refresh interval is set no smaller than the status probe interval of the switch.

DPN Performance Viewer Procedures

You can perform the following tasks with DPN Performance Viewer:

- "Starting the DPN Performance Viewer" (page 129)
- "Displaying component information" (page 130)

Starting the DPN Performance Viewer

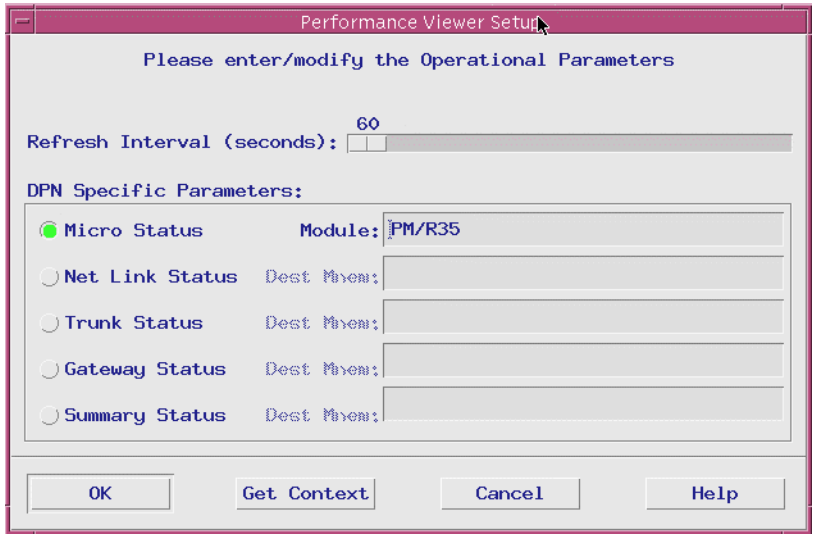
You need to specify a DPN status display and a DPN module name or a reporting destination mnemonic (Dest Mnem).

Note: The DPN destination mnemonic is not the OA name; however, it allows you to identify an OA more precisely. For most setups, the primary OA and its destination mnemonic are the same.

Starting the DPN Performance Viewer from the Performance toolset

1 In the Preside MDM window, select **Performance** ->**DPN Performance Viewer**.

The **Performance Viewer Setup** window opens.



2 To display performance information, choose one of the following:

   a. For a DPN micro status display, click **Micro Status** and enter the PM you want to monitor.

   b. For a DPN network link status display, click **Net Link Status** and enter the reporting Dest Mnem you want to monitor.

   c. For a DPN trunk status display, click **Trunk Status** and enter the reporting Dest Mnem you want to monitor.

   d. For a DPN gateway status display, click **Gateway Status** and enter the reporting Dest Mnem you want to monitor.

   e. For a DPN summary status display, click **Summary Status**, and enter the reporting Dest Mnem you want to monitor.

Displaying component information

DPN Performance Viewer displays performance information about multiple DPN components.

The DPN Performance Viewer gives multiple component displays only for the five different DPN status types that you can select in the setup dialog. The components in the DPN displays represent the various components that the **Dest Mnem** is reporting.

Displaying DPN status information

1 Click one of the DPN status buttons.

2 Type the component name in the **PM** or **Dest Mnem** field beside the button for example, **OA/BARNEY** is a reporting **Dest Mnem** name): or click **Context action**. This places the current context into the active text field. You need to have a Dest Mnem (or PM) in context.

3 Move the slider control in the **Refresh Interval (seconds)** field to select a desired probe frequency for displaying data. The **Refresh Interval** has a 60-second default setting. You can choose an interval between 60 and 600 seconds (10 minutes).

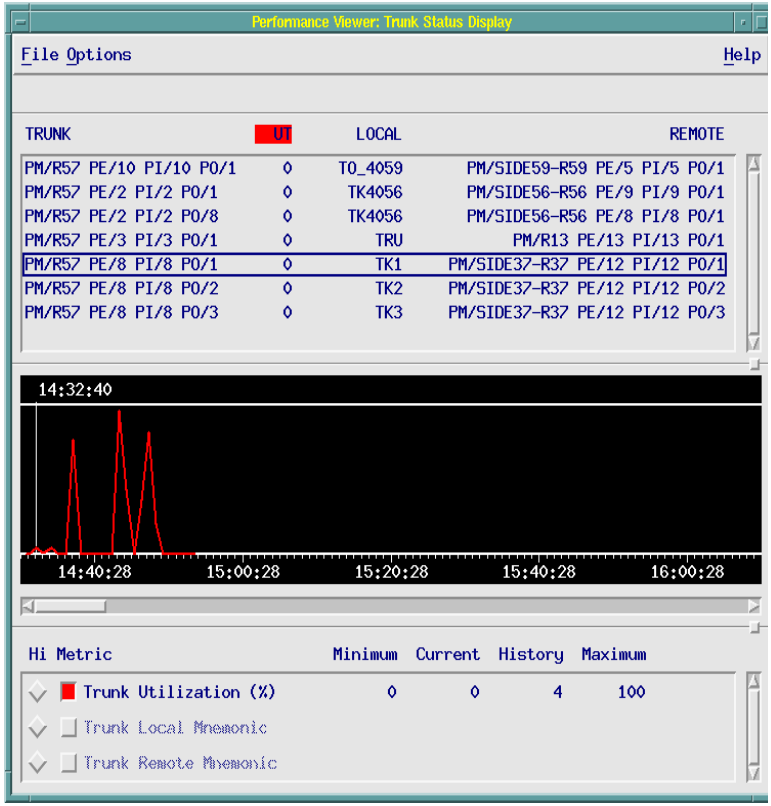
Note: An initial attempt occurs to get all the information at the start of the collection. After this attempt, the probe tries once every selected refresh interval.

CAUTION

The refresh interval should be equal to or greater than the maximum NCS status probe interval for the whole network. If not, the accuracy of the DPN Performance Viewer is affected.

4 Click **OK**.

The **Performance Viewer** window opens and the **Performance Viewer Setup** window closes.



This sample screen graphs the **Trunk Utilization** performance of DPN components under a Dest Mnem. The Performance Viewer used a refresh interval of 60 seconds and ran for about thirty minutes.

Controlling the graphic display

The **Performance Viewer** window contains several control areas. Use the mouse to activate a variety of display controls.

Single component display information

The single component **Performance Viewer** window contains the following areas and controls:

- a title bar at the top of the window showing the component name
- a menu bar with **File**, **Options,** and **Help** menus
- a graphic display area with a moveable vertical History Line
- a time scale and a horizontal scroll control below it
- a textual display area with buttons to the left and a vertical scroll control to the right. The default for the metrics button is Off. You need to select the metrics that you want to view as a graph.

Filtering information about a single component

1 Use the inner buttons at the bottom of the screen on the left-hand side to filter the display you want to see. You can display graphs of CPU Utilization (%)and Msg Block Utilization (%) for card components. For trunk components, you can display Packets/sec from interface, Trunk Pks/sec from interface, Discarded Packets/sec, and Round trip delay/ms. For bus components, you can display Bus Utilization (%).

   The DPN Performance Viewer reports the values obtained in the text display area on the right of the buttons and graphs these results in the graphic display area. The color of the button matches the line displayed in the graph. The endpoint of the graph line represents the latest value obtained and is updated according to the **Refresh Interval** you select in the **Performance Viewer Setup Dialog**.

2 Position the cursor in the graph display area and move the **History Line** to display values for a chosen moment of interest. Left click the mouse to move the **History Line** to the current cursor position. You can also use the left and right arrow keys to move the History line in increments of one data point.

   The **History Line** moves to the selected point, and the values obtained for that period are displayed in the text display area.

   Note: You cannot move the **History Line** to a point before the Performance Viewer is started or to a point beyond the current value.

3 If you want to view the maximum value for the period during which the Performance Viewer is active, click **High Water Mark** of the selected metric.

The History Line finds the High Water Mark and reports this value in the text display area.

4 If you want to change the nature of the DPN Performance Viewer display, use the **Options** menu. Change parameters lets you view the performance of another component after you enter the component ID in the **Performance Viewer Setup** dialog. You may also reset the refresh interval to a different value.

Note 1: Changing components is identical to exiting the current Performance Viewer and starting a new one. All history for the previous Performance Viewer is lost and any log file output is stopped. If you change the refresh interval, new history points are lined up based on the new refresh interval. This can result in the graph being stretched or squeezed.

Note 2: See **Help for Change Parameters** to find detailed component support information.

5 Use the **File** menu to create and view Performance Viewer log files. Start log prompts you to name a log file that you want to create and then writes collected information to that log file. The log file is updated every time more information is collected, until **Stop log**, **Change Parameters,** or **Exit** is selected. **Stop log** stops output to the log file. View log retrieves and displays saved Performance Viewer log files.

Note: If you select a filename identical to a previously saved log file, the saved log file is overwritten with the latest performance information.

Multiple component display information

The multiple component **Performance Viewer** window is similar to the single component window but has one additional display area. The top of the window contains different displays depending on the kind of multiple components you are viewing. This area is always present when viewing Data Packet Network (DPN) status.

Clicking one of the numbered radio button creates a display of that component's performance in the graphic display area below. Any previous component display is replaced by the new selection.

For the DPN status displays, the multiple component area shows a list of all the PE's, etc., that are report information through the specified Dest Mnem. Clicking an item in the list creates a display of that component's performance in the graphic display area below. Any previous component display is replaced by the new selection.

Note: Down DPN components appear in the list with an orange background.

Filtering information about multiple components

1 Use the inner buttons at the bottom of the screen to filter the display you want to see. You can display graphs of CPU Utilization (%) and Msg Block Utilization (%) for any single card on the Passport shelf.

The DPN Performance Viewer reports the values obtained in the text display area on the right of the buttons and graphs these results in the graphic display area above. The color of the button matches the line displayed in the graph or list. The endpoint of the graph line represents the latest value obtained and is updated according to the **Refresh Interval**

you select in the Performance Viewer Setup Dialog.

2 To see information on another component, click the numbered radio button or the list item that corresponds to that component at the top of the screen.

3 All other procedures and controls are identical to those described in steps 2-5 in “Filtering information about a single component” (page 133).

Customizing DPN Performance Viewer default settings

You can change several default settings. To override these defaults, enter new values in the .Xdefaults file in your $HOME/MagellanNMS directory as shown in the table “Resources for customizing Performance Viewer default settings” (page 136).

Table 1
Resources for customizing Performance Viewer default settings

Resource	Description	Legal values
PV*historyLimit	Specifies the number of data points the Performance Viewer can remember. This setting affects the size of the graphic display.	The default value is 1 000. You can choose any value between 200 and 10 000.
PV*logFile	Is used to enter a default log filename whenever you use the Start Log… option under the File menu.	You can choose any valid UNIX absolute path file.
PV*refreshInterval	Sets the refresh frequency default.	The default value is 300 seconds; however, you can choose a setting between 10 and 600 seconds (60 and 600 seconds for DPN displays).
PV*metricButton.set	Is used to set the initial state of the metric buttons.	The default is False, which means no graphs are initially displayed.

For additional information on customization, see 241-6001-301 *Preside MDM Customization Administrator Guide*.

Understanding DPN Performance Viewer log files

You can write the information collected by DPN Performance Viewer to a log file. These log files use an ASCII format and can be viewed or machine read. For procedures about creating and viewing DPN Performance Viewer log files, see step 5 in "Filtering information about a single component" (page 133).

Log file information uses the following syntax:

time : component : metric : value

time is the time stamp of the current line's output in the format yyyy mm dd hh mm ss. The time is fetched from the Preside Multiservice Data Manager (MDM) workstation clock at the moment the data is received.

component is a fully qualified component name. For example, PM/R34 PE/8

metric is the calculation defined in the metric database. For example, CPU Utilization (%).

value is the numeric or string result of the most recent calculation. For example, 42.

Here is an example of one line of output in a log file:

2002 01 31 15 52 51: PM/34 PE/8: CPU Utilization (%) : 0

> ***Note:*** Colons are used to separate the fields and to improve machine readability. This means that you cannot use colons as part of the component identification or the metric name if machine readability is expected.

Appendix A
Passport performance metrics

Passport performance metrics are generated by the Data Viewer and are detailed by component, in alphabetical order.

Note: Do not use an equal sign "=" in the <metric name>. It may cause parsing errors

Table 2
Component: EM/ AAL1CES/

Name	Formula	Meaning
Tx Cells per second	(cellsTransmitted/NUM) DELTA SECONDS DIVIDE	Number of cells sent to the interface per second since the last probe.
Tx Cells since Baseline	(cellsTransmitted/NUM) BASELINEDELTA	Number of cells sent to the interface since the last baseline reset.
Rx Cells per second	(cellsReceived/NUM) DELTA SECONDS DIVIDE	Number of cells received from the interface per second since the last probe.
Rx Cells since Baseline	(cellsReceived/NUM) BASELINEDELTA	Number of cells received from the interface since the last baseline reset.
Total Lost Cells	(lostCells/NUM)	Total number of cells lost since activation.
Total Buffer Underflows	(bufferUnderflows/NUM)	Total number of buffer underflows since activation.

(Sheet 1 of 2)

Table 2 (continued)
Component: EM/ AAL1CES/

Name	Formula	Meaning
Total Buffer Overflows	(bufferOverflows/NUM)	Total number of buffer overflows since activation.
Reassembled Cells per second	(reassembledCells/NUM) DELTA SECONDS DIVIDE	Number of reassembled cells per second since the last probe.
Reassembled Cells since Baseline	(reassembledCells/NUM) BASELINEDELTA	Number of reassembled cells since the last baseline reset.
Total Header Errors	(headerErrors/NUM)	Number of header errors accumulated.
Total Pointer Reframe Errors	(pointerReframes/NUM)	Number of Pointer Reframes accumulated.
Total Pointer Parity Errors	(pointerParityErrors/NUM)	Number of Pointer Parity Errors accumulated.
Total AAL1 Sequence Errors	(aal1SequenceErrors/NUM)	Number of Sequence Errors accumulated.
Total Misinserted Cells	(misinsertedCells/NUM)	Number of Misinserted Cells accumulated.

(Sheet 2 of 2)

Table 3
Component: EM/ ARTG PNNI

Name	Formula	Meaning
Routing Attempts	(routingAttempts/NUM) DELTA	Counts the calls routed. PNNI indicates the switch has PNNI routing capability.
Routing Attempts since Baseline	(routingAttempts/NUM) BASELINEDELTA (successfulRoutingAttempts/NUM) BASELINEDELTA ADD	Counts the calls routed since the last baseline reset. PNNI indicates the switch has PNNI routing capability.

(Sheet 1 of 2)

Table 3 (continued)
Component: EM/ ARTG PNNI

Name	Formula	Meaning
Failed Routing Attempts	(failedRoutingAttempts/NUM) DELTA	Counts the calls which were not successfully routed. PNNI indicates the switch has PNNI routing capability.
Failed Routing Attempts since Baseline	(failedRoutingAttempts/NUM) BASELINEDELTA	Counts the calls which were not successfully routed since the last baseline reset. PNNI indicates the switch has PNNI routing capability.
Calls Rerouted	(alternateRoutingAttempts/NUM) DELTA	Counts the calls that were routed an alternate route. PNNI indicates the switch has PNNI routing capability.
Calls Rerouted since Baseline	(alternateRoutingAttempts/NUM) BASELINEDELTA	Counts the calls that were routed an alternate route since the last baseline reset. PNNI indicates the switch has PNNI routing capability.

(Sheet 2 of 2)

Table 4
Component: EM/ ATMIF/

Name	Formula	Meaning
K Tx Cells per minute	(TransmittedCells/NUM) DELTA (txCell/NUM) DELTA ADD SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells sent per minute.
K Tx Cells since Baseline	(TransmittedCells/NUM) BASELINEDELTA (txCell/NUM) BASELINEDELTA ADD 1000 DIVIDE	Kilocells sent since the last baseline reset.

(Sheet 1 of 2)

Table 4 (continued)
Component: EM/ ATMIF/

Name	Formula	Meaning
K Rx Cells per minute	(receivedCells/NUM) DELTA (rxCell/NUM) DELTA ADD SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells received per minute.
K Rx Cells since Baseline	(receivedCells/NUM) BASELINEDELTA (rxCell/NUM) BASELINEDELTA ADD 1000 DIVIDE	Kilocells received since the last baseline reset.
Dropped Rx Cells	(droppedRxCells/NUM) DELTA	Cells dropped.
Dropped Rx Cells since Baseline	(droppedRxCells/NUM) BASELINEDELTA	Cells dropped since the last baseline reset.
Tx LinkUtilization	(txLinkUtilization/NUM)	Indicates the current transmit traffic rate over the most recent minute.
Rx LinkUtilization	(rxLinkUtilization/NUM)	Indicates the current receive traffic rate over the most recent minute.

(Sheet 2 of 2)

Table 5
Component: EM/ ATMIF/ VCC/

Name	Formula	Meaning
K Tx Cells per minute	(txCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells sent per minute.
K Tx Cells since Baseline	(txCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells sent since the last baseline reset.
K Rx Cells per minute	(rxCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells received per minute.

(Sheet 1 of 4)

Table 5 (continued)
Component: EM/ ATMIF/ VCC/

Name	Formula	Meaning
K Rx Cells since Baseline	(rxCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells received since the last baseline reset.
Tx Cells CLP per second	(txCellClp/NUM) DELTA SECONDS DIVIDE	Cells sent at CLP.
Tx Cells CLP since Baseline	(txCellClp/NUM) BASELINEDELTA	Cells sent at CLP since the last baseline reset.
Rx Cells CLP per second	(rxCellClp/NUM) DELTA SECONDS DIVIDE	Cells received at CLP.
Rx Cells CLP since Baseline	(rxCellClp/NUM) BASELINEDELTA	Cells received at CLP since the last baseline reset.
Cell Transmit Discards	(txDiscard/NUM) DELTA (txCellDiscard/NUM) DELTA ADD	Sent cells discarded.
Cell Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txCellDiscard/NUM) BASELINEDELTA ADD	Sent cells discarded since the last baseline reset.
Frame Transmit Discards	(txDiscard/NUM) DELTA (txFrameDiscard/NUM) DELTA ADD	Send frames discarded.
Frame Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txFrameDiscard/NUM) BASELINEDELTA ADD	Send frames discarded since the last baseline reset.
Cell Receive Discards	(rxDiscard/NUM) DELTA (rxCellDiscard/NUM) DELTA ADD	Received cells discarded.

(Sheet 2 of 4)

Table 5 (continued)
Component: EM/ ATMIF/ VCC/

Name	Formula	Meaning
Cell Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxCellDiscard/NUM) BASELINEDELTA ADD	Received cells discarded since the last baseline reset.
Frame Receive Discards	(rxDiscard/NUM) DELTA (rxFrameDiscard/NUM) DELTA ADD	Received frames discarded.
Frame Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxFrameDiscard/NUM) BASELINEDELTA ADD	Received frames discarded since the last baseline reset.
Cell Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txCellDiscardClp/NUM) DELTA ADD	Sent cells discarded at CLP.
Cell Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txCellDiscardClp/NUM) BASELINEDELTA ADD	Sent cells discarded at CLP since the last baseline reset.
Frame Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txFrameDiscardClp/NUM) DELTA ADD	Sent frames discarded at CLP.
Frame Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txFrameDiscardClp/NUM) BASELINEDELTA ADD	Sent frames discarded at CLP since the last baseline reset.
Cell Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxCellDiscardClp/NUM) DELTA ADD	Received cells discarded at CLP.

(Sheet 3 of 4)

Table 5 (continued)
Component: EM/ ATMIF/ VCC/

Name	Formula	Meaning
Cell Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxCellDiscardClp/NUM) BASELINEDELTA ADD	Received cells discarded at CLP since the last baseline reset.
Frame Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxFrameDiscardClp/NUM) DELTA ADD	Received frames discarded at CLP.
Frame Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxFrameDiscardClp/NUM) BASELINEDELTA ADD	Received frames discarded at CLP since the last baseline reset.
Transmit Discards	(txDiscard/NUM) DELTA	Sent cells discarded.
Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA	Sent cells discarded since the last baseline reset.
Receive Discards	(rxDiscard/NUM) DELTA	Received cells discarded.
Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA	Received cells discarded since the last baseline reset.
Transmit Discards CLP	(txDiscardClp/NUM) DELTA	Sent cells discarded at CLP.
Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA	Sent cells discarded at CLP since the last baseline reset.
Receive Discards CLP	(rxDiscardClp/NUM) DELTA	Received cells discarded at CLP.
Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA	Received cells discarded at CLP since the last baseline reset.

(Sheet 4 of 4)

Table 6
Component: EM/ ATMIF/ VPC/

Name	Formula	Meaning
K Tx Cells per minute	(txCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells sent per minute.
K Tx Cells since Baseline	(txCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells sent since the last baseline reset.
K Rx Cells per minute	(rxCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells received per minute.
K Rx Cells since Baseline	(rxCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells received since the last baseline reset.
Tx Cells CLP per second	(txCellClp/NUM) DELTA SECONDS DIVIDE	Cells sent at CLP.
Tx Cells CLP since Baseline	(txCellClp/NUM) BASELINEDELTA	Cells sent at CLP since the last baseline reset.
Rx Cells CLP per second	(rxCellClp/NUM) DELTA SECONDS DIVIDE	Cells received at CLP.
Rx Cells CLP since Baseline	(rxCellClp/NUM) BASELINEDELTA	Cells received at CLP since the last baseline reset.
Cell Transmit Discards	(txDiscard/NUM) DELTA (txCellDiscard/NUM) DELTA ADD	Sent cells discarded.
Cell Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txCellDiscard/NUM) BASELINEDELTA ADD	Sent cells discarded since the last baseline reset.
Frame Transmit Discards	(txDiscard/NUM) DELTA (txFrameDiscard/NUM) DELTA ADD	Send frames discarded.

(Sheet 1 of 3)

Table 6 (continued)
Component: EM/ ATMIF/ VPC/

Name	Formula	Meaning
Frame Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txFrameDiscard/NUM) BASELINEDELTA ADD	Send frames discarded since the last baseline reset.
Cell Receive Discards	(rxDiscard/NUM) DELTA (rxCellDiscard/NUM) DELTA ADD	Received cells discarded.
Cell Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxCellDiscard/NUM) BASELINEDELTA ADD	Received cells discarded since the last baseline reset.
Frame Receive Discards	(rxDiscard/NUM) DELTA (rxFrameDiscard/NUM) DELTA ADD	Received frames discarded.
Frame Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxFrameDiscard/NUM) BASELINEDELTA ADD	Received frames discarded since the last baseline reset.
Cell Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txCellDiscardClp/NUM) DELTA ADD	Sent cells discarded at CLP.
Cell Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txCellDiscardClp/NUM) BASELINEDELTA ADD	Sent cells discarded at CLP since the last baseline reset.
Frame Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txFrameDiscardClp/NUM) DELTA ADD	Sent frames discarded at CLP.
Frame Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txFrameDiscardClp/NUM) BASELINEDELTA ADD	Sent frames discarded at CLP since the last baseline reset.

(Sheet 2 of 3)

Table 6 (continued)
Component: EM/ ATMIF/ VPC/

Name	Formula		Meaning
Cell Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxCellDiscardClp/NUM) DELTA ADD		Received cells discarded at CLP.
Cell Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxCellDiscardClp/NUM) BASELINEDELTA ADD		Received cells discarded at CLP since the last baseline reset.
Frame Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxFrameDiscardClp/NUM) DELTA ADD		Received frames discarded at CLP.
Frame Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxFrameDiscardClp/NUM) BASELINEDELTA ADD		Received frames discarded at CLP since the last baseline reset.
Transmit Discards	(txDiscard/NUM)	DELTA	Sent cells discarded.
Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA		Sent cells discarded since the last baseline reset.
Receive Discards	(rxDiscard/NUM)	DELTA	Received cells discarded.
Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA		Received cells discarded since the last baseline reset.
Transmit Discards CLP	(txDiscardClp/NUM) DELTA		Sent cells discarded at CLP.
Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA		Sent cells discarded at CLP since the last baseline reset.
Receive Discards CLP	(rxDiscardClp/NUM) DELTA		Received cells discarded at CLP.
Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA		Received cells discarded at CLP since the last baseline reset.

(Sheet 3 of 3)

Table 7
Component: EM/ ATMIF/ VPT/

Name	Formula	Meaning
K Tx Cells per minute	(txCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells sent per minute.
K Tx Cells since Baseline	(txCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells sent since the last baseline reset.
K Rx Cells per minute	(rxCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells received per minute.
K Rx Cells since Baseline	(rxCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells received since the last baseline reset.
Tx Cells CLP per second	(txCellClp/NUM) DELTA SECONDS DIVIDE	Cells sent at CLP.
Tx Cells CLP since Baseline	(txCellClp/NUM) BASELINEDELTA	Cells sent at CLP since the last baseline reset.
Rx Cells CLP per second	(rxCellClp/NUM) DELTA SECONDS DIVIDE	Cells received at CLP.
Rx Cells CLP since Baseline	(rxCellClp/NUM) BASELINEDELTA	Cells received at CLP since the last baseline reset.
Cell Transmit Discards	(txDiscard/NUM) DELTA (txCellDiscard/NUM) DELTA ADD	Sent cells discarded.
Cell Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txCellDiscard/NUM) BASELINEDELTA ADD	Sent cells discarded since the last baseline reset.
Frame Transmit Discards	(txDiscard/NUM) DELTA (txFrameDiscard/NUM) DELTA ADD	Send frames discarded.

(Sheet 1 of 3)

Table 7 (continued)
Component: EM/ ATMIF/ VPT/

Name	Formula	Meaning
Frame Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txFrameDiscard/NUM) BASELINEDELTA ADD	Send frames discarded since the last baseline reset.
Cell Receive Discards	(rxDiscard/NUM) DELTA (rxCellDiscard/NUM) DELTA ADD	Received cells discarded.
Cell Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxCellDiscard/NUM) BASELINEDELTA ADD	Received cells discarded since the last baseline reset.
Frame Receive Discards	(rxDiscard/NUM) DELTA (rxFrameDiscard/NUM) DELTA ADD	Received frames discarded.
Frame Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxFrameDiscard/NUM) BASELINEDELTA ADD	Received frames discarded since the last baseline reset.
Cell Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txCellDiscardClp/NUM) DELTA ADD	Sent cells discarded at CLP.
Cell Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txCellDiscardClp/NUM) BASELINEDELTA ADD	Sent cells discarded at CLP since the last baseline reset.
Frame Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txFrameDiscardClp/NUM) DELTA ADD	Sent frames discarded at CLP.
Frame Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txFrameDiscardClp/NUM) BASELINEDELTA ADD	Sent frames discarded at CLP since the last baseline reset.

(Sheet 2 of 3)

Table 7 (continued)
Component: EM/ ATMIF/ VPT/

Name	Formula		Meaning
Cell Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxCellDiscardClp/NUM) DELTA ADD		Received cells discarded at CLP.
Cell Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxCellDiscardClp/NUM) BASELINEDELTA ADD		Received cells discarded at CLP since the last baseline reset.
Frame Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxFrameDiscardClp/NUM) DELTA ADD		Received frames discarded at CLP.
Frame Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxFrameDiscardClp/NUM) BASELINEDELTA ADD		Received frames discarded at CLP since the last baseline reset.
Transmit Discards	(txDiscard/NUM)	DELTA	Sent cells discarded.
Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA		Sent cells discarded since the last baseline reset.
Receive Discards	(rxDiscard/NUM)	DELTA	Received cells discarded.
Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA		Received cells discarded since the last baseline reset.
Transmit Discards CLP	(txDiscardClp/NUM) DELTA		Sent cells discarded at CLP.
Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA		Sent cells discarded at CLP since the last baseline reset.
Receive Discards CLP	(rxDiscardClp/NUM) DELTA		Received cells discarded at CLP.
Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA		Received cells discarded at CLP since the last baseline reset.

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Table 8
Component: EM/ ATMIF/ VPT/ VCC/

Name	Formula	Meaning
K Tx Cells per minute	(txCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells sent per minute.
K Tx Cells since Baseline	(txCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells sent since the last baseline reset.
K Rx Cells per minute	(rxCell/NUM) DELTA SECONDS DIVIDE 6 MULTIPLY 100 DIVIDE	Kilocells received per minute.
K Rx Cells since Baseline	(rxCell/NUM) BASELINEDELTA 1000 DIVIDE	Kilocells received since the last baseline reset.
Tx Cells CLP per second	(txCellClp/NUM) DELTA SECONDS DIVIDE	Cells sent at CLP.
Tx Cells CLP since Baseline	(txCellClp/NUM) BASELINEDELTA	Cells sent at CLP since the last baseline reset.
Rx Cells CLP per second	(rxCellClp/NUM) DELTA SECONDS DIVIDE	Cells received at CLP.
Rx Cells CLP since Baseline	(rxCellClp/NUM) BASELINEDELTA	Cells received at CLP since the last baseline reset.
Cell Transmit Discards	(txDiscard/NUM) DELTA (txCellDiscard/NUM) DELTA ADD	Sent cells discarded.
Cell Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txCellDiscard/NUM) BASELINEDELTA ADD	Sent cells discarded since the last baseline reset.
Frame Transmit Discards	(txDiscard/NUM) DELTA (txFrameDiscard/NUM) DELTA ADD	Send frames discarded.

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Table 8 (continued)
Component: EM/ ATMIF/ VPT/ VCC/

Name	Formula	Meaning
Frame Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA (txFrameDiscard/NUM) BASELINEDELTA ADD	Send frames discarded since the last baseline reset.
Cell Receive Discards	(rxDiscard/NUM) DELTA (rxCellDiscard/NUM) DELTA ADD	Received cells discarded.
Cell Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxCellDiscard/NUM) BASELINEDELTA ADD	Received cells discarded since the last baseline reset.
Frame Receive Discards	(rxDiscard/NUM) DELTA (rxFrameDiscard/NUM) DELTA ADD	Received frames discarded.
Frame Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA (rxFrameDiscard/NUM) BASELINEDELTA ADD	Received frames discarded since the last baseline reset.
Cell Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txCellDiscardClp/NUM) DELTA ADD	Sent cells discarded at CLP.
Cell Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txCellDiscardClp/NUM) BASELINEDELTA ADD	Sent cells discarded at CLP since the last baseline reset.
Frame Transmit Discards CLP	(txDiscardClp/NUM) DELTA (txFrameDiscardClp/NUM) DELTA ADD	Sent frames discarded at CLP.
Frame Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA (txFrameDiscardClp/NUM) BASELINEDELTA ADD	Sent frames discarded at CLP since the last baseline reset.

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Table 8 (continued)
Component: EM/ ATMIF/ VPT/ VCC/

Name	Formula		Meaning
Cell Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxCellDiscardClp/NUM) DELTA ADD		Received cells discarded at CLP.
Cell Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxCellDiscardClp/NUM) BASELINEDELTA ADD		Received cells discarded at CLP since the last baseline reset.
Frame Receive Discards CLP	(rxDiscardClp/NUM) DELTA (rxFrameDiscardClp/NUM) DELTA ADD		Received frames discarded at CLP.
Frame Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA (rxFrameDiscardClp/NUM) BASELINEDELTA ADD		Received frames discarded at CLP since the last baseline reset.
Transmit Discards	(txDiscard/NUM)	DELTA	Sent cells discarded.
Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA		Sent cells discarded since the last baseline reset.
Receive Discards	(rxDiscard/NUM)	DELTA	Received cells discarded.
Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA		Received cells discarded since the last baseline reset.
Transmit Discards CLP	(txDiscardClp/NUM) DELTA		Sent cells discarded at CLP.
Transmit Discards CLP since Baseline	(txDiscardClp/NUM) BASELINEDELTA		Sent cells discarded at CLP since the last baseline reset.
Receive Discards CLP	(rxDiscardClp/NUM) DELTA		Received cells discarded at CLP.
Receive Discards CLP since Baseline	(rxDiscardClp/NUM) BASELINEDELTA		Received cells discarded at CLP since the last baseline reset.

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Table 9
Component: EM/ ATMMPE/ AC/

Name	Formula	Meaning
In Packets/sec	(inPackets/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets received on this connection.
In Packets since Baseline	(inPackets/NUM) BASELINEDELTA	Counts the total number of packets received on this connection since the last baseline reset.
In Octects/sec	(inOctets/NUM) DELTA SECONDS DIVIDE	Counts the total number of octets received on this connection.
In Octects since Baseline	(inOctets/NUM) BASELINEDELTA	Counts the total number of octets received on this connection since the last baseline reset.
In UnknownProtos/sec	(inUnknownProtos/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets received on this connection which were discarded because they contained an unknown or unsupported protocol.
In UnknownProtos since Baseline	(inUnknownProtos/NUM) BASELINEDELTA	Counts the total number of packets received on this connection which were discarded because they contained an unknown or unsupported protocol, since the last baseline reset.
In Errors/sec	(inErrors/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets received on the connection which contained errors preventing them from being delivered to a higher-layer protocol.

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Table 9 (continued)
Component: EM/ ATMMPE/ AC/

Name	Formula	Meaning
In Errors since Baseline	(inErrors/NUM) BASELINEDELTA	Counts the total number of packets received on the connection which contained errors preventing them from being delivered to a higher-layer protocol, since the last baseline reset.
Out Packets/sec	(outPackets/NUM) DELTA SECONDS DIVIDE	outPackets
Out Packets since Baseline	(outPackets/NUM) BASELINEDELTA	outPackets since the last baseline reset.
Out Octects/sec	(outOctets/NUM) DELTA SECONDS DIVIDE	Counts the total number of octets sent on this connection.
Out Octects since Baseline	(outOctets/NUM) BASELINEDELTA	Counts the total number of octets sent on this connection since the last baseline reset.
Out Discards/sec	(outDiscards/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets which were supposed to be sent on this connection, but were discarded due to congestion or the connection being down.
Out Discards since Baseline	(outDiscards/NUM) BASELINEDELTA	Counts the total number of packets which were supposed to be sent on this connection, but were discarded due to congestion or the connection being down, since the last baseline reset.

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Table 10
Component: EM/ BSSMIF/

Name	Formula		Meaning
txPackets	(txPackets/NUM)	DELTA	The description for this metric is currently not defined.
txPackets since Baseline	(txPackets/NUM) BASELINEDELTA		The description for this metric is currently not define.
rxPackets	(rxPackets/NUM)	DELTA	The description for this metric is currently not defined.
rxPackets since Baseline	(rxPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
txPacketDiscards	(txPacketDiscards/NUM) DELTA		The description for this metric is currently not defined.
txPacketDiscards since Baseline	(txPacketDiscards/NUM) BASELINEDELTA		The description for this metric is currently not defined.
rxPacketDiscards	(rxPacketDiscards/NUM) DELTA		The description for this metric is currently not defined.
rxPacketDiscards since Baseline	(rxPacketDiscards/NUM) BASELINEDELTA		The description for this metric is currently not defined.

Table 11
Component: EM/ BTDS/ FRAMER

Name	Formula		Meaning
Frames per second Sent	(frmToIf/NUM) SECONDS	DELTA DIVIDE	Number of frames per second transmitted to the link interface by Framer, since last probe.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA		Number of frames transmitted to the link interface by Framer, since the last baseline reset.

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Table 11 (continued)
Component: EM/ BTDS/ FRAMER

Name	Formula	Meaning
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Number or frames per second received from the link interface by Framer, since last probe.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Number or frames received from the link interface by Framer, since the last baseline reset.
LRC Errors	(lrcErrors/NUM) DELTA	Number of frames received from the link interface with CRC errors, since last probe.
LRC Errors since Baseline	(lrcErrors/NUM) BASELINEDELTA	Number of frames received from the link interface with CRC errors, since the last baseline reset.
Frame Lost in Network	(frmLostInNetwork/NUM) DELTA	Number of frames the service did not receive from the network, since last probe.
Frame Lost in Network since Baseline	(frmLostInNetwork/NUM) BASELINEDELTA	Number of frames the service did not receive from the network, since the last baseline reset.
Frames Underruns	(frmUnderRuns/NUM) DELTA	Number of times a frame was needed but was not available because it was delayed too long in the network, since last probe.
Frames Underruns since Baseline	(frmUnderRuns/NUM) BASELINEDELTA	Number of times a frame was needed but was not available because it was delayed too long in the network, since the last baseline reset.

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Table 11 (continued)
Component: EM/ BTDS/ FRAMER

Name	Formula	Meaning
Frame Dumped	(frmDumped/NUM) DELTA	Number of frames dumped because the local interface output queue was too large, since last probe.
Frame Dumped since Baseline	(frmDumped/NUM) BASELINEDELTA	Number of frames dumped because the local interface output queue was too large, since the last baseline reset.

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Table 12
Component: EM/ BTS/ BTSIF/

Name	Formula	Meaning
txPackets	(txPackets/NUM) DELTA	The description for this metric is currently not defined.
txPackets since Baseline	(txPackets/NUM) BASELINEDELTA	The description for this metric is currently not defined.
rxPackets	(rxPackets/NUM) DELTA	The description for this metric is currently not defined.
rxPackets since Baseline	(rxPackets/NUM) BASELINEDELTA	The description for this metric is currently not defined.
txOctets	(txOctets/NUM) DELTA	The description for this metric is currently not defined.
txOctets since Baseline	(txOctets/NUM) BASELINEDELTA	The description for this metric is currently not defined.
rxOctets	(rxOctets/NUM) DELTA	The description for this metric is currently not defined.
rxOctets since Baseline	(rxOctets/NUM) BASELINEDELTA	The description for this metric is currently not defined.
txPacketDiscards	(txPacketDiscards/NUM) DELTA	The description for this metric is currently not defined.

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Table 12 (continued)
Component: EM/ BTS/ BTSIF/

Name	Formula	Meaning
txPacketDiscards since Baseline	(txPacketDiscards/NUM) BASELINEDELTA	The description for this metric is currently not defined.
rxPacketDiscards	(rxPacketDiscards/NUM) DELTA	The description for this metric is currently not defined.
rxPacketDiscards since Baseline	(rxPacketDiscards/NUM) BASELINEDELTA	The description for this metric is currently not defined.

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Table 13
Component: EM/ CIUIF/

Name	Formula		Meaning
txPackets	(txPackets/NUM)	DELTA	The description for this metric is currently not defined.
txPackets since Baseline	(txPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
rxPackets	(rxPackets/NUM)	DELTA	The description for this metric is currently not defined.
rxPackets since Baseline	(rxPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
txOctets	(txOctets/NUM)	DELTA	The description for this metric is currently not defined.
txOctets since Baseline	(txOctets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
rxOctets	(rxOctets/NUM)	DELTA	The description for this metric is currently not defined.
rxOctets since Baseline	(rxOctets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
txPacketDiscards	(txPacketDiscards/NUM) DELTA		The description for this metric is currently not defined.

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Table 13 (continued)
Component: EM/ CIUIF/

Name	Formula	Meaning
txPacketDiscards since Baseline	(txPacketDiscards/NUM) BASELINEDELTA	The description for this metric is currently not defined.
rxPacketDiscards	(rxPacketDiscards/NUM) DELTA	The description for this metric is currently not defined.
rxPacketDiscards since Baseline	(rxPacketDiscards/NUM) BASELINEDELTA	The description for this metric is currently not defined.
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Table 14
Component: EM/ CRS

Name	Formula	Meaning
Redir Attempts / second	(requestsReceived/NUM) DELTA SECONDS DIVIDE	Provides a set of alternate destinations for the original address.
Redir Attempts since Baseline	(requestsReceived/NUM) BASELINEDELTA	Provides a set of alternate destinations for the original address since the last baseline reset.

Table 15
Component: EM/ DISCOIF/

Name	Formula		Meaning
txPackets	(txPackets/NUM)	DELTA	The description for this metric is currently not defined.
txPackets since Baseline	(txPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
rxPackets	(rxPackets/NUM)	DELTA	The description for this metric is currently not defined.
rxPackets since Baseline	(rxPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
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Table 15 (continued)
Component: EM/ DISCOIF/

Name	Formula	Meaning
txPacketDiscards	(txPacketDiscards/NUM) DELTA	The description for this metric is currently not defined.
txPacketDiscards since Baseline	(txPacketDiscards/NUM) BASELINEDELTA	The description for this metric is currently not defined.
rxPacketDiscards	(rxPacketDiscards/NUM) DELTA	The description for this metric is currently not defined.
rxPacketDiscards since Baseline	(rxPacketDiscards/NUM) BASELINEDELTA	The description for this metric is currently not defined.

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Table 16
Component: EM/ DLEP/ DS1/

Name	Formula		Meaning
CRC Errors	(crcErrors/NUM)	DELTA	The description for this metric is currently not defined.
CRC Errors since Baseline	(crcErrors/NUM) BASELINEDELTA		The description for this metric is currently not defined.
Frame Errors	(frmErrors/NUM)	DELTA	The description for this metric is currently not defined.
Frame Errors since Baseline	(frmErrors/NUM) BASELINEDELTA		The description for this metric is currently not defined.
SLIP Errors	(slipErrors/NUM)	DELTA	The description for this metric is currently not defined.
SLIP Errors since Baseline	(slipErrors/NUM) BASELINEDELTA		The description for this metric is currently not defined.

Table 17
Component: EM/ DLEP/ DS1/ CHAN/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	The description for this metric is currently not defined.
Tx Cell Util	(transmitCellUtilization/NUM)	The description for this metric is currently not defined.

Table 18
Component: EM/ DPNGATE/

Name	Formula	Meaning
Packets/sec from Interface	(pktFromIf/NUM) DELTA SECONDS DIVIDE	Packets from interface per second.
Packets from Interface since Baseline	(pktFromIf/NUM) BASELINEDELTA	Packets from interface since the last baseline reset.
Trunk Pks/s to Interface	(trunkPktToIf/NUM) DELTA SECONDS DIVIDE	Trunk packets to interface per second.
Trunk Pks to Interface since Baseline	(trunkPktToIf/NUM) BASELINEDELTA	Trunk packets to interface since the last baseline reset.
Trunk Pks/s from Interface	(trunkPktFromIf/NUM) DELTA SECONDS DIVIDE	Trunk packets from interface per second.
Trunk Pks from Interface since Baseline	(trunkPktFromIf/NUM) BASELINEDELTA	Trunk packets from interface since the last baseline reset.
Discarded packets/sec	(discardUnforward/NUM) DELTA SECONDS DIVIDE	Discarded packets per second.

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Table 18 (continued)
Component: EM/ DPNGATE/

Name	Formula	Meaning
Discarded packets since Baseline	(discardUnforward/NUM) BASELINEDELTA	Discarded packets since the last baseline reset.
Round trip delay (ms)	(measuredRoundTripDelay/NUM)	Round trip delay in millisecond measured by the DPN Gateway.

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Table 19
Component: EM/ DPNGATE/ UTP FRAMER

Name	Formula	Meaning
Frames per second to Interface	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames to Interface since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second from Interface	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames from Interface since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Outgoing Priority Link Utilization	(highPrioLinkUtilToIf/NUM)	Priority traffic sending link utilization.
Incoming Priority Link Utilization	(highPrioLinkUtilFromIf/NUM)	Priority traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.

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Table 19 (continued)
Component: EM/ DPNGATE/ UTP FRAMER

Name	Formula		Meaning
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA		Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA		Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA		Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM)	DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA		Number of aborted frames since the last baseline reset.

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Table 20
Component: EM/ FRATM/ DLCI/

Name	Formula		Meaning
Frames per second Received	(frmFromIf/NUM) SECONDS	DELTA DIVIDE	Number of frames per second received from the interface since last probe.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA		Number of frames received from the interface since the last baseline reset.
DE Frames Received	(deFrmFromIf/NUM) DELTA		Number of frames received from the interface with the Discard Eligibility (DE) bit set since last probe.
DE Frames Received since Baseline	(deFrmFromIf/NUM) BASELINEDELTA		Number of frames received from the interface with the Discard Eligibility (DE) bit set, since the last baseline reset.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
Excess Frames Received	(excessFrmFromIf/NUM) DELTA	Number of frames, received from the interface with the Discard Eligibility (DE) bit clear, but subsequently set by the network due to rate enforcement, since the last probe.
Excess Frames Received since Baseline	(excessFrmFromIf/NUM) BASELINEDELTA	Number of frames, received from the interface with the Discard Eligibility (DE) bit clear, but subsequently set by the network due to rate enforcement, since the last baseline reset.
Discard Excess Received per second	(discExcessFromIf/NUM) DELTA SECONDS DIVIDE	Number of frames discarded due to rate enforcement.
Discard Excess Received since Baseline	(discExcessFromIf/NUM) BASELINEDELTA	Number of frames discarded due to rate enforcement, since the last baseline reset.
Discarded Frame A bit	(discFrameAbit/NUM) DELTA	Number of frames discarded at the Frame Relay Service due to an inactive PVC status in the direction toward the interworking function, since last probe.
Discarded Frame A bit since Baseline	(discFrameAbit/NUM) BASELINEDELTA	Number of frames discarded at the Frame Relay Service due to an inactive PVC status in the direction toward the interworking function, since the last baseline reset.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
Congested Frames Received Discarded	(discCongestedFromI/NUM) DELTA	Number of frames discarded at the Frame Relay Service due to local congestion in the direction toward the interworking funcion, since last probe.
Congested Frames Received Discarded since Baseline	(discCongestedFromI/NUM) BASELINEDELTA	Number of frames discarded at the Frame Relay Service due to local congestion in the direction toward the interworking funcion, since the last baseline reset.
Error short Frame Received	(errorShortFrmFromI/NUM) DELTA	Number of frames received with 0 octets in the information field, since last probe.
Error short Frame Received since Baseline	(errorShortFrmFromIf/NUM) BASELINEDELTA	Number of frames received with 0 octets in the information field, since the last baseline reset.
Error Long Frame Received	(errorLongFrmFromIf/NUM) DELTA	Number of frames received with the number of octets in the information field greater than the subscribed maximum, since last probe.
Error Long Frame Received since Baseline	(errorLongFrmFromIf/NUM) BASELINEDELTA	Number of frames received with the number of octets in the information field greater than the subscribed maximum, since the last baseline reset.
Kilobytes Sent	(bytesToIf/NUM) DELTA 1000 DIVIDE	Number of bytes sent out to the interface, since last probe.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
Kilobytes Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA 1000 DIVIDE	Number of bytes sent out to the interface since the last baseline reset.
DE bytes	(deBytesToIf/NUM) DELTA	Number of bytes sent to the interface with Discard Eligibility (DE) bit set.
DE bytes since Baseline	(deBytesToIf/NUM) BASELINEDELTA	Number of bytes sent to the interface with Discard Eligibility (DE) bit set, since the last baseline reset.
Kilobytes Received	(bytesFromIf/NUM) DELTA 1000 DIVIDE	Number of bytes received from the interface.
Kilobytes Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA 1000 DIVIDE	Number of bytes received from the interface since the last baseline reset.
DE bytes received per second	(deBytesFromIf/NUM) DELTA SECONDS DIVIDE	Number of bytes per second received from the interface with Discard Eligibility (DE) bit set.
DE bytes received since Baseline	(deBytesFromIf/NUM) BASELINEDELTA	Number of bytes received from the interface with Discard Eligibility (DE) bit set, since the last baseline reset.
Excess bytes received per second	(excessBytesFromIf/NUM) DELTA SECONDS DIVIDE	Number of bytes per second received from the interface with the Discard Eligibility (DE) bit clear but sebsequently set by the network due to rate enforcement, since last probe.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
Excess bytes received since Baseline	(excessBytesFromIf/NUM) BASELINEDELTA	Number of bytes received from the interface with the Discard Eligibility (DE) bit clear but sebsequently set by the network due to rate enforcement, since the last baseline reset.
Frame Discards for Rate Enforcement	(discExcessFromIfBy/NUM) DELTA	Number of bytes discarded due to rate enforcement, since last probe.
Frame Discards for Rate Enforcement since Baseline	(discExcessFromIfBytes/NUM) BASELINEDELTA	Number of bytes discarded due to rate enforcement since the last baseline reset.
Byte Discards due to A equals 0	(discByteAbit/NUM) DELTA	Number of bytes discarded due to the A bit being turned off, since last probe.
Byte Discards due to A equals 0 since Baseline	(discByteAbit/NUM) BASELINEDELTA	Number of bytes discarded due to the A bit being turned off since the last baseline reset.
Discarded congested received	(discCongestedFromI/NUM) DELTA	Number of bytes discarded at the Frame Relay service due to local congestion in the direction toward the interworking function, since last probe.
Discarded congested received since Baseline	(discCongestedFromIfBytes/NUM) BASELINEDELTA	Number of bytes discarded at the Frame Relay service due to local congestion in the direction toward the interworking function, since the last baseline reset.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
DE Discarded congested received	(discDeCongestedFro/NUM) DELTA	Number of bytes discarded with Discard Eligibility set due to local congestion in the direction toward the interworking fucntion, since last probe.
DE Discarded congested received since Baseline	(discDeCongestedFromIfBytes/ NUM) BASELINEDELTA	Number of bytes discarded with Discard Eligibility set due to local congestion in the direction toward the interworking fucntion, since the last baseline reset.
Error Long Bytes received	(errorLongBytesFrom/NUM) DELTA	Number of bytes received when the number of octets in the information field is greater than the subscribed maximum, since last probe.
Error Long Bytes received since Baseline	(errorLongBytesFromIf/NUM) BASELINEDELTA	Number of bytes received when the number of octets in the information field is greater than the subscribed maximum, since the last baseline reset.
Total Ingress Bytes	(totalIngressBytes/NUM) DELTA	Total payload bytes in received from link since the start of interval.
Total Ingress Bytes since Baseline	(totalIngressBytes/NUM) BASELINEDELTA	Total payload bytes in received from link since the last baseline reset.
Total Egress Bytes	(totalEgressBytes/NUM) DELTA	Total payload bytes sent to link since start of interval.
Total Egress Bytes since Baseline	(totalEgressBytes/NUM) BASELINEDELTA	Total payload bytes sent to link since the last baseline reset.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
EIR Ingress Bytes	(eirIngressBytes/NUM) DELTA	Total valid payload bytes in frames with Discard Eligibility (DE) bit set to 1 received from link since start of interval.
EIR Ingress Bytes since Baseline	(eirIngressBytes/NUM) BASELINEDELTA	Total valid payload bytes in frames with Discard Eligibility (DE) bit set to 1 received from link, since the last baseline reset.
EIR Egress Bytes	(eirEgressBytes/NUM) DELTA	Total valid payload bytes in frames with Discard Eligibility (DE) bit set sent to link since start of interval.
EIR Egress Bytes since Baseline	(eirEgressBytes/NUM) BASELINEDELTA	Total valid payload bytes in frames with Discard Eligibility (DE) bit set sent to link, since the last baseline reset.
Discarded Bytes	(discardedBytes/NUM) DELTA	Total payload bytes in invalid frames received from the link and siscarded at the DLCI since start of interval.
Discarded Bytes since Baseline	(discardedBytes/NUM) BASELINEDELTA	Total payload bytes in invalid frames received from the link and siscarded at the DLCI, since the last baseline reset.
Total Ingress frames	(totalIngressFrames/NUM) DELTA	Total number of frames received from the link since start of interval.
Total Ingress frames since Baseline	(totalIngressFrames/NUM) BASELINEDELTA	Total number of frames received from the link since the last baseline reset.

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Table 20 (continued)
Component: EM/ FRATM/ DLCI/

Name	Formula	Meaning
Total Egress frames	(totalEgressFrames/NUM) DELTA	Total number of frames sent to the link since the start of interval.
Total Egress frames since Baseline	(totalEgressFrames/NUM) BASELINEDELTA	Total number of frames sent to the link since the last baseline reset.
EIR Ingress frames	(eirIngressFrames/NUM) DELTA	Number of valid frames with Discard Eligibility set to 1, received from link since start of interval.
EIR Ingress frames since Baseline	(eirIngressFrames/NUM) BASELINEDELTA	Number of valid frames with Discard Eligibility set to 1, received from link, since the last baseline reset.
EIR Egress frames	(eirEgressFrames/NUM) DELTA	Number of frames with Discard Eligibility bit set sent to the link since start of interval.
EIR Egress frames since Baseline	(eirEgressFrames/NUM) BASELINEDELTA	Number of frames with Discard Eligibility bit set sent to the link, since the last baseline reset.
Discarded Frames	(discardedFrames/NUM) DELTA	Number of invalid frames received from the links and discarded at the DLCI.
Discarded Frames since Baseline	(discardedFrames/NUM) BASELINEDELTA	Number of invalid frames received from the links and discarded at the DLCI, since the last baseline reset.

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Table 21
Component: EM/ FRATM/ FRAMER

Name	Formula		Meaning
Frames per second Sent	(frmToIf/NUM) SECONDS	DELTA DIVIDE	The number of frames per second transmitted to the link interface by Framer since last probe.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA		The number of frames transmitted to the link interface by Framer since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) SECONDS	DELTA DIVIDE	The number of frames received from the link interface by Framer since the last probe.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA		The number of frames received from the link interface by Framer since the last baseline reset.
CRC Errors	(crcErrors/NUM)	DELTA	Number of frames with CRC errors occurring in the receive direction from the link since the last probe.
CRC Errors since Baseline	(crcErrors/NUM) BASELINEDELTA		Number of frames with CRC errors occurring in the receive direction from the link, since the last baseline reset.
LRC Errors	(lrcErrors/NUM)	DELTA	Number of frames with LRC errors occurring in the Tx link prior to transmission onto the link since the last probe.
LRC Errors since Baseline	(lrcErrors/NUM) BASELINEDELTA		Number of frames with LRC errors occurring in the Tx link prior to transmission onto the link, since the last baseline reset.

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Table 21 (continued)
Component: EM/ FRATM/ FRAMER

Name	Formula		Meaning
Overruns	(overruns/NUM)	DELTA	Number of frames received from the link for which overruns occurred since last probe.
Overruns since Baseline	(overruns/NUM) BASELINEDELTA		Number of frames received from the link for which overruns occurred, since the last baseline reset.
Underruns	(underruns/NUM)	DELTA	Number of frames transmitted to the link for which underruns occurred since last probe.
Underruns since Baseline	(underruns/NUM) BASELINEDELTA		Number of frames transmitted to the link for which underruns occurred, since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA		Number of frames received that were too large since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA		Number of frames received that were too large since the last baseline reset.

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Table 22
Component: EM/ FRDTE/ DLCI/

Name	Formula	Meaning
Frames per second Sent	(sentFrames/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(sentFrames/NUM) BASELINEDELTA	Frames sent since the last baseline reset.

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Table 22 (continued)
Component: EM/ FRDTE/ DLCI/

Name	Formula	Meaning
Frames per second Received	(receivedFrames/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(receivedFrames/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Kilobytes Sent	(sentOctets/NUM) DELTA 1000 DIVIDE	KiloBytes sent since the last probe.
Kilobytes Sent since Baseline	(sentOctets/NUM) BASELINEDELTA 1000 DIVIDE	KiloBytes sent since the last baseline reset.
Kilobytes Received	(receivedOctets/NUM) DELTA 1000 DIVIDE	KiloBytes received since the last probe.
Kilobytes Received since Baseline	(receivedOctets/NUM) BASELINEDELTA 1000 DIVIDE	KiloBytes received since the last baseline reset.
FECN Frames Received	(receivedFECNs/NUM) DELTA	Frames received with FECN bit set.
FECN Frames Received since Baseline	(receivedFECNs/NUM) BASELINEDELTA	Frames received with FECN bit set since the last baseline reset.
BECN Frames Received	(receivedBECNs/NUM) DELTA	Frames received with BECN bit set.
BECN Frames Received since Baseline	(receivedBECNs/NUM) BASELINEDELTA	Frames received with BECN bit set since the last baseline reset.

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Table 23
Component: EM/ FRDTE/ FRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA	Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA	Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA	Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM) DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA	Number of aborted frames since the last baseline reset.

Table 24
Component: EM/ FRDTE/ VFRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToOtherVFramer/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToOtherVFramer/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromOtherVFramer/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromOtherVFramer/NUM) BASELINEDELTA	Frames received since the last baseline reset.

Table 25
Component: EM/ FRNNI/

Name	Formula	Meaning
Frame Header Format Errors	(invalidHeaderFramesFromIf/NUM) DELTA	Number of frames with invalid headers since last probe.
Frame Header Format Errors since Baseline	(invalidHeaderFramesFromIf/NUM) BASELINEDELTA	Number of frames with invalid headers since the last baseline reset.
Unknown DLCI Errors	(unknownDlciFramesFromIf/NUM) DELTA	Number of frames with unknown DLCI since last probe.
Unknown DLCI Errors since Baseline	(unknownDlciFramesFromIf/NUM) BASELINEDELTA	Number of frames with unknown DLCI since the last baseline reset.
Last Unknown DLCI	(lastUnknownDlci/NUM)	DLCI of the last unknown DLCI frame.

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(continued)Table 25
Component: EM/ FRNNI/

Name	Formula	Meaning
Frames To I/F	(frmToIfByQueue[0]/NUM) DELTA (frmToIfByQueue[1]/NUM) DELTA (frmToIfByQueue[2]/NUM) DELTA (frmToIfByQueue[3]/NUM) DELTA ADD ADD ADD	Number of frames transmitted to the interface through all egress queues.
Frames To I/F since Baseline	(frmToIfByQueue[0]/NUM) BASELINEDELTA (frmToIfByQueue[1]/NUM) BASELINEDELTA (frmToIfByQueue[2]/NUM) BASELINEDELTA (frmToIfByQueue[3]/NUM) BASELINEDELTA ADD ADD ADD	Number of frames transmitted to the interface through all egress queues since the last baseline reset.
Octecs To I/F	(octetToIfByQueue[0]/NUM) DELTA (octetToIfByQueue[1]/NUM) DELTA (octetToIfByQueue[2]/NUM) DELTA (octetToIfByQueue[3]/NUM) DELTA ADD ADD ADD	Number of octets transmitted to the interface through all egress queues.
Octecs To I/F since Baseline	(octetToIfByQueue[0]/NUM) BASELINEDELTA (octetToIfByQueue[1]/NUM) BASELINEDELTA (octetToIfByQueue[2]/NUM) BASELINEDELTA (octetToIfByQueue[3]/NUM) BASELINEDELTA ADD ADD ADD	Number of octets transmitted to the interface through all egress queues since the last baseline reset.

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Table 25
Component: EM/ FRNNI/ DLCI/

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Kilobytes Sent	(bytesToIf/NUM) DELTA 1000 DIVIDE	KiloBytes sent since the last probe.
Kilobytes Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA 1000 DIVIDE	KiloBytes sent since the last baseline reset.
Kilobytes Received	(bytesFromIf/NUM) DELTA 1000 DIVIDE	KiloBytes received since the last probe.
Kilobytes Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA 1000 DIVIDE	KiloBytes received since the last baseline reset.
Average Payload Size Sent	(bytesToIf/NUM) DELTA (frmToIf/NUM) DELTA DIVIDE	Average size of frames in bytes sent out from the interface.
Average Payload Size Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA (frmToIf/NUM) BASELINEDELTA DIVIDE	Average size of frames in bytes sent out from the interface since the last baseline reset.
Average Payload Size Received	(bytesFromIf/NUM) DELTA (frmFromIf/NUM) DELTA DIVIDE	Average size of frames in bytes received from the interface.

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Table 25 (continued)
Component: EM/ FRNNI/ DLCI/

Name	Formula	Meaning
Average Payload Size Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA (frmFromIf/NUM) BASELINEDELTA DIVIDE	Average size of frames in bytes received from the interface since the last baseline reset.
Kilobits per second Sent	(bytesToIf/NUM) DELTA 8 MULTIPLY SECONDS DIVIDE 1000 DIVIDE	Kilobits per second sent.
Kilobits Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA 8 MULTIPLY 1000 DIVIDE	Kilobits sent since the last baseline reset.
Kilobits per second Received	(bytesFromIf/NUM) DELTA 8 MULTIPLY SECONDS DIVIDE 1000 DIVIDE	Kilobits per second received.
Kilobits Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA 8 MULTIPLY 1000 DIVIDE	Kilobits received since the last baseline reset.
Rx Utilization (% of CIR)	(bytesFromIf/NUM) DELTA 8 MULTIPLY SECONDS DIVIDE (committedInformationRate/NUM) PERCENT	Percentage of CIR used receiving.
Tx Bytes Discarded	(discCongestedToIfBytes/NUM) DELTA	Bytes sent dropped due to congestion.
Tx Bytes Discarded since Baseline	(discCongestedToIfBytes/NUM) BASELINEDELTA	Bytes sent dropped due to congestion since the last baseline reset.

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Table 25 (continued)
Component: EM/ FRNNI/ DLCI/

Name	Formula	Meaning
Rx Bytes Discarded	(discExcessFromIfBytes/NUM) DELTA (discByteAbit/ NUM) DELTA ADD (discCongestedFromIfBytes/NUM) DELTA ADD (errorLongBytesFromIf/NUM) DELTA ADD	Bytes received dropped.
Rx Bytes Discarded since Baseline	(discExcessFromIfBytes/NUM) BASELINEDELTA (discByteAbit/NUM) BASELINEDELTA ADD (discCongestedFromIfBytes/NUM) BASELINEDELTA ADD (errorLongBytesFromIf/NUM) BASELINEDELTA ADD	Bytes received dropped since the last baseline reset.
Frame Discards due to A equals 0	(discFrameAbit/NUM) DELTA	Received frames discarded due to zero A bit.
Frame Discards due to A equals 0 since Baseline	(discFrameAbit/NUM) BASELINEDELTA	Received frames discarded due to zero A bit since the last baseline reset.
Frame Discards due to Frame Error	(errorShortFrmFromIf/NUM) DELTA (errorLongFrmFromIf/NUM) DELTA ADD	Received frames discarded due to length errors.
Frame Discards due to Frame Error since Baseline	(errorShortFrmFromIf/NUM) BASELINEDELTA (errorLongFrmFromIf/NUM) BASELINEDELTA ADD	Received frames discarded due to length errors since the last baseline reset.
Frame Discards for Rate Enforcement	(discExcessFromIf/NUM) DELTA	Received frames discarded by rate enforcement.
Frame Discards for Rate Enforcement since Baseline	(discExcessFromIf/NUM) BASELINEDELTA	Received frames discarded by rate enforcement since the last baseline reset.

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Table 25 (continued)
Component: EM/ FRNNI/ DLCI/

Name	Formula	Meaning
Byte Discards due to A equals 0	(discByteAbit/NUM) DELTA	Received Bytes discarded due to zero A bit.
Byte Discards due to A equals 0 since Baseline	(discByteAbit/NUM) BASELINEDELTA	Received Bytes discarded due to zero A bit since the last baseline reset.
Byte Discards due to Frame Error	(errorLongBytesFromIf/NUM) DELTA	Received Bytes discarded due to frame length error.
Byte Discards due to Frame Error since Baseline	(errorLongBytesFromIf/NUM) BASELINEDELTA	Received Bytes discarded due to frame length error since the last baseline reset.
Byte Discards for Rate Enforcement	(discExcessFromIfBytes/NUM) DELTA	Received bytes discarded by rate enforcement.
Byte Discards for Rate Enforcement since Baseline	(discExcessFromIfBytes/NUM) BASELINEDELTA	Received bytes discarded by rate enforcement since the last baseline reset.
FECN Frames Sent	(fecnFrmToIf/NUM) DELTA	Frames sent with FECN bit set.
FECN Frames Sent since Baseline	(fecnFrmToIf/NUM) BASELINEDELTA	Frames sent with FECN bit set since the last baseline reset.
FECN Frames Received	(fecnFrmFromIf/NUM) DELTA	Frames received with FECN bit set.
FECN Frames Received since Baseline	(fecnFrmFromIf/NUM) BASELINEDELTA	Frames received with FECN bit set since the last baseline reset.
BECN Frames Sent	(becnFrmToIf/NUM) DELTA	Frames sent with BECN bit set.
BECN Frames Sent since Baseline	(becnFrmToIf/NUM) BASELINEDELTA	Frames sent with BECN bit set since the last baseline reset.
BECN Frames Received	(becnFrmFromIf/NUM) DELTA	Frames received with BECN bit set.

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Table 25 (continued)
Component: EM/ FRNNI/ DLCI/

Name	Formula	Meaning
BECN Frames Received since Baseline	(becnFrmFromIf/NUM) BASELINEDELTA	Frames received with BECN bit set since the last baseline reset.
DE Frames Sent	(deFrmToIf/NUM) DELTA	Frames sent with DE bit set.
DE Frames Sent since Baseline	(deFrmToIf/NUM) BASELINEDELTA	Frames sent with DE bit set since the last baseline reset.
DE Frames Received	(deFrmFromIf/NUM) DELTA	Frames received with DE bit set.
DE Frames Received since Baseline	(deFrmFromIf/NUM) BASELINEDELTA	Frames received with DE bit set since the last baseline reset.
Congested Frames Sent Discarded	(discCongestedToIf/NUM) DELTA	Sent frames discarded due to congestion.
Congested Frames Sent Discarded since Baseline	(discCongestedToIf/NUM) BASELINEDELTA	Sent frames discarded due to congestion since the last baseline reset.
Congested Frames Received Discarded	(discCongestedFromIf/NUM) DELTA	Received frames discarded due to congestion.
Congested Frames Received Discarded since Baseline	(discCongestedFromIf/NUM) BASELINEDELTA	Received frames discarded due to congestion since the last baseline reset.
Excess Frames Received	(excessFrmFromIf/NUM) DELTA	Number of excess frames.
Excess Frames Received since Baseline	(excessFrmFromIf/NUM) BASELINEDELTA	Number of excess frames since the last baseline reset.

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Table 26
Component: EM/ FRNNI/ FRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA	Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA	Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA	Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM) DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA	Number of aborted frames since the last baseline reset.

Table 27
Table 28Component: EM/ FRNNI/ LMI

Name	Formula	Meaning
Status Reports Tx	(keepAliveStatusToIf/NUM) DELTA (fullStatusToIf/ NUM) DELTA ADD	Number of status reports sent since last probe.
Status Reports Tx since Baseline	(keepAliveStatusToIf/NUM) BASELINEDELTA (fullStatusToIf/NUM) BASELINEDELTA ADD	Number of status reports sent since the last baseline reset.
Status Enquiries Rx	(keepAliveSeFromIf/NUM) DELTA (fullStatEnqFromIf/NUM) DELTA ADD	Number of status reports received since last probe.
Status Enquiries Rx since Baseline	(keepAliveSeFromIf/NUM) BASELINEDELTA (fullStatEnqFromIf/NUM) BASELINEDELTA ADD	Number of status reports received since the last baseline reset.
Sequence Number Mismatches	(sequenceErrors/NUM)	Number of Status enquiries with a sequence error.
Invalid Requests	(unexpectedIes/NUM)	Number of frames received with an unknown/unexpected IES.
Timeouts	(pollingVerifTimeouts/NUM) (noStatusReportCount/NUM) ADD	Number of checkPointTimer expired.

Table 29
Component: EM/ FRNNI/ VFRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToOtherVFramer/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToOtherVFramer/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromOtherVFramer/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromOtherVFramer/NUM) BASELINEDELTA	Frames received since the last baseline reset.

Table 30
Component: EM/ FRUNI/

Name	Formula	Meaning
Frame Header Format Errors	(invalidHeaderFramesFromIf/ NUM) DELTA	Number of frames with invalid headers since last probe.
Frame Header Format Errors since Baseline	(invalidHeaderFramesFromIf/ NUM) BASELINEDELTA	Number of frames with invalid headers since the last baseline reset.
Unknown DLCI Errors	(unknownDlciFramesFromIf/NUM) DELTA	Number of frames with unknown DLCI since last probe.
Unknown DLCI Errors since Baseline	(unknownDlciFramesFromIf/NUM) BASELINEDELTA	Number of frames with unknown DLCI since the last baseline reset.
Last Unknown DLCI	(lastUnknownDlci/NUM)	DLCI of the last unknown DLCI frame.

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Table 30 (continued)
Component: EM/ FRUNI/

Name	Formula	Meaning
Frames To I/F	(frmToIfByQueue[0]/NUM) DELTA (frmToIfByQueue[1]/NUM) DELTA (frmToIfByQueue[2]/NUM) DELTA (frmToIfByQueue[3]/NUM) DELTA ADD ADD ADD	Number of frames transmitted to the interface through all egress queues.
Frames To I/F since Baseline	(frmToIfByQueue[0]/NUM) BASELINEDELTA (frmToIfByQueue[1]/NUM) BASELINEDELTA (frmToIfByQueue[2]/NUM) BASELINEDELTA (frmToIfByQueue[3]/NUM) BASELINEDELTA ADD ADD ADD	Number of frames transmitted to the interface through all egress queues since the last baseline reset.
Octecs To I/F	(octetToIfByQueue[0]/NUM) DELTA (octetToIfByQueue[1]/NUM) DELTA (octetToIfByQueue[2]/NUM) DELTA (octetToIfByQueue[3]/NUM) DELTA ADD ADD ADD	Number of octets transmitted to the interface through all egress queues.
Octecs To I/F since Baseline	(octetToIfByQueue[0]/NUM) BASELINEDELTA (octetToIfByQueue[1]/NUM) BASELINEDELTA (octetToIfByQueue[2]/NUM) BASELINEDELTA (octetToIfByQueue[3]/NUM) BASELINEDELTA ADD ADD ADD	Number of octets transmitted to the interface through all egress queues since the last baseline reset.

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Table 31
Component: EM/ FRUNI/ DLCI/

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Kilobytes Sent	(bytesToIf/NUM) DELTA 1000 DIVIDE	KiloBytes sent since the last probe.
Kilobytes Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA 1000 DIVIDE	KiloBytes sent since the last baseline reset.
Kilobytes Received	(bytesFromIf/NUM) DELTA 1000 DIVIDE	KiloBytes received since the last probe.
Kilobytes Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA 1000 DIVIDE	KiloBytes received since the last baseline reset.
Average Payload Size Sent	(bytesToIf/NUM) DELTA (frmToIf/NUM) DELTA DIVIDE	Average size of frames in bytes sent out from the interface.
Average Payload Size Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA (frmToIf/NUM) BASELINEDELTA DIVIDE	Average size of frames in bytes sent out from the interface since the last baseline reset.
Average Payload Size Received	(bytesFromIf/NUM) DELTA (frmFromIf/NUM) DELTA DIVIDE	Average size of frames in bytes received from the interface.

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Table 31 (continued)
Component: EM/ FRUNI/ DLCI/

Name	Formula	Meaning
Average Payload Size Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA (frmFromIf/NUM) BASELINEDELTA DIVIDE	Average size of frames in bytes received from the interface since the last baseline reset.
Kilobits per second Sent	(bytesToIf/NUM) DELTA 8 MULTIPLY SECONDS DIVIDE 1000 DIVIDE	Kilobits per second sent.
Kilobits Sent since Baseline	(bytesToIf/NUM) BASELINEDELTA 8 MULTIPLY 1000 DIVIDE	Kilobits sent since the last baseline reset.
Kilobits per second Received	(bytesFromIf/NUM) DELTA 8 MULTIPLY SECONDS DIVIDE 1000 DIVIDE	Kilobits per second received.
Kilobits Received since Baseline	(bytesFromIf/NUM) BASELINEDELTA 8 MULTIPLY 1000 DIVIDE	Kilobits received since the last baseline reset.
Rx Utilization (% of CIR)	(bytesFromIf/NUM) DELTA 8 MULTIPLY SECONDS DIVIDE (committedInformationRate/NUM) PERCENT	Percentage of CIR used receiving.
Tx Bytes Discarded	(discCongestedToIfBytes/NUM) DELTA	Bytes sent dropped due to congestion.
Tx Bytes Discarded since Baseline	(discCongestedToIfBytes/NUM) BASELINEDELTA	Bytes sent dropped due to congestion since the last baseline reset.

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Table 31 (continued)
Component: EM/ FRUNI/ DLCI/

Name	Formula	Meaning
Rx Bytes Discarded	(discExcessFromIfBytes/NUM) DELTA (discByteAbit/ NUM) DELTA ADD (discCongestedFromIfBytes/NUM) DELTA ADD (errorLongBytesFromIf/NUM) DELTA ADD	Bytes received dropped.
Rx Bytes Discarded since Baseline	(discExcessFromIfBytes/NUM) BASELINEDELTA (discByteAbit/NUM) BASELINEDELTA ADD (discCongestedFromIfBytes/NUM) BASELINEDELTA ADD (errorLongBytesFromIf/NUM) BASELINEDELTA ADD	Bytes received dropped since the last baseline reset.
Frame Discards due to A equals 0	(discFrameAbit/NUM) DELTA	Received frames discarded due to zero A bit.
Frame Discards due to A equals 0 since Baseline	(discFrameAbit/NUM) BASELINEDELTA	Received frames discarded due to zero A bit since the last baseline reset.
Frame Discards due to Frame Error	(errorShortFrmFromIf/NUM) DELTA (errorLongFrmFromIf/NUM) DELTA ADD	Received frames discarded due to length errors.
Frame Discards due to Frame Error since Baseline	(errorShortFrmFromIf/NUM) BASELINEDELTA (errorLongFrmFromIf/NUM) BASELINEDELTA ADD	Received frames discarded due to length errors since the last baseline reset.
Frame Discards for Rate Enforcement	(discExcessFromIf/NUM) DELTA	Received frames discarded by rate enforcement.
Frame Discards for Rate Enforcement since Baseline	(discExcessFromIf/NUM) BASELINEDELTA	Received frames discarded by rate enforcement since the last baseline reset.

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Table 31 (continued)
Component: EM/ FRUNI/ DLCI/

Name	Formula	Meaning
Byte Discards due to A equals 0	(discByteAbit/NUM) DELTA	Received Bytes discarded due to zero A bit.
Byte Discards due to A equals 0 since Baseline	(discByteAbit/NUM) BASELINEDELTA	Received Bytes discarded due to zero A bit since the last baseline reset.
Byte Discards due to Frame Error	(errorLongBytesFromIf/NUM) DELTA	Received Bytes discarded due to frame length error.
Byte Discards due to Frame Error since Baseline	(errorLongBytesFromIf/NUM) BASELINEDELTA	Received Bytes discarded due to frame length error since the last baseline reset.
Byte Discards for Rate Enforcement	(discExcessFromIfBytes/NUM) DELTA	Received bytes discarded by rate enforcement.
Byte Discards for Rate Enforcement since Baseline	(discExcessFromIfBytes/NUM) BASELINEDELTA	Received bytes discarded by rate enforcement since the last baseline reset.
FECN Frames Sent	(fecnFrmToIf/NUM) DELTA	Frames sent with FECN bit set.
FECN Frames Sent since Baseline	(fecnFrmToIf/NUM) BASELINEDELTA	Frames sent with FECN bit set since the last baseline reset.
FECN Frames Received	(fecnFrmFromIf/NUM) DELTA	Frames received with FECN bit set.
FECN Frames Received since Baseline	(fecnFrmFromIf/NUM) BASELINEDELTA	Frames received with FECN bit set since the last baseline reset.
BECN Frames Sent	(becnFrmToIf/NUM) DELTA	Frames sent with BECN bit set.
BECN Frames Sent since Baseline	(becnFrmToIf/NUM) BASELINEDELTA	Frames sent with BECN bit set since the last baseline reset.
BECN Frames Received	(becnFrmFromIf/NUM) DELTA	Frames received with BECN bit set.

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Table 31 (continued)
Component: EM/ FRUNI/ DLCI/

Name	Formula	Meaning
BECN Frames Received since Baseline	(becnFrmFromIf/NUM) BASELINEDELTA	Frames received with BECN bit set since the last baseline reset.
DE Frames Sent	(deFrmToIf/NUM) DELTA	Frames sent with DE bit set.
DE Frames Sent since Baseline	(deFrmToIf/NUM) BASELINEDELTA	Frames sent with DE bit set since the last baseline reset.
DE Frames Received	(deFrmFromIf/NUM) DELTA	Frames received with DE bit set.
DE Frames Received since Baseline	(deFrmFromIf/NUM) BASELINEDELTA	Frames received with DE bit set since the last baseline reset.
Congested Frames Sent Discarded	(discCongestedToIf/NUM) DELTA	Sent frames discarded due to congestion.
Congested Frames Sent Discarded since Baseline	(discCongestedToIf/NUM) BASELINEDELTA	Sent frames discarded due to congestion since the last baseline reset.
Congested Frames Received Discarded	(discCongestedFromIf/NUM) DELTA	Received frames discarded due to congestion.
Congested Frames Received Discarded since Baseline	(discCongestedFromIf/NUM) BASELINEDELTA	Received frames discarded due to congestion since the last baseline reset.
Excess Frames Received	(excessFrmFromIf/NUM) DELTA	Number of excess frames.
Excess Frames Received since Baseline	(excessFrmFromIf/NUM) BASELINEDELTA	Number of excess frames since the last baseline reset.

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Table 32
Component: EM/ FRUNI/ FRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA	Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA	Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA	Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM) DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA	Number of aborted frames since the last baseline reset.

Table 33
Component: EM/ FRUNI/ LMI

Name	Formula	Meaning
Status Reports Tx	(keepAliveStatusToIf/NUM) DELTA (fullStatusToIf/NUM) DELTA ADD	Number of status reports sent since last probe.
Status Reports Tx since Baseline	(keepAliveStatusToIf/NUM) BASELINEDELTA (fullStatusToIf/NUM) BASELINEDELTA ADD	Number of status reports sent since the last baseline reset.
Status Enquiries Rx	(keepAliveSeFromIf/NUM) DELTA (fullStatEnqFromIf/NUM) DELTA ADD	Number of status reports received since last probe.
Status Enquiries Rx since Baseline	(keepAliveSeFromIf/NUM) BASELINEDELTA (fullStatEnqFromIf/NUM) BASELINEDELTA ADD	Number of status reports received since the last baseline reset.
Sequence Number Mismatches	(sequenceErrors/NUM)	Number of Status enquiries with a sequence error.
Invalid Requests	(unexpectedIes/NUM)	Number of frames received with an unknown/unexpected IES.
Timeouts	(pollingVerifTimeouts/NUM) (noStatusReportCount/NUM) ADD	Number of checkPointTimer expired.

Table 34
Component: EM/ FRUNI/ VFRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToOtherVFramer/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToOtherVFramer/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromOtherVFramer/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromOtherVFramer/NUM) BASELINEDELTA	Frames received since the last baseline reset.

Table 35
Component: EM/ HTDS/ FRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Number of frames per second transmitted to the link interface by Framer, since last probe.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Number of frames per second transmitted to the link interface by Framer, since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Number of frames per second received from the link interface by Framer, since last probe.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Number of frames received from the link interface by Framer, since the last baseline reset.
CRC Errors	(crcErrors/NUM) DELTA	Number of frames with CRC errors, since last probe.

(Sheet 1 of 2)

Table 35 (continued)
Component: EM/ HTDS/ FRAMER

Name	Formula		Meaning
CRC Errors since Baseline	(crcErrors/NUM) BASELINEDELTA		Number of frames with CRC errors since the last baseline reset.
LRC Errors	(lrcErrors/NUM)	DELTA	Number of frames with LRC errors, since last probe.
LRC Errors since Baseline	(lrcErrors/NUM) BASELINEDELTA		Number of frames with LRC errors since the last baseline reset.
Overruns	(overruns/NUM)	DELTA	Number of frames received from the link for which overruns occurred, since last probe.
Overruns since Baseline	(overruns/NUM) BASELINEDELTA		Number of frames received from the link for which overruns occurred, since the last baseline reset.
Underruns	(underruns/NUM)	DELTA	Number of frames transmitted to the link for which underruns occurred, since last probe.
Underruns since Baseline	(underruns/NUM) BASELINEDELTA		Number of frames transmitted to the link for which underruns occurred, since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA		Number of frames received that were too large, since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA		Number of frames received that were too large since the last baseline reset.

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Table 36
Component: EM/ ISSHOIF/

Name	Formula		Meaning
txPackets	(txPackets/NUM)	DELTA	The description for this metric is currently not defined.
txPackets since Baseline	(txPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
rxPackets	(rxPackets/NUM)	DELTA	The description for this metric is currently not defined.
rxPackets since Baseline	(rxPackets/NUM) BASELINEDELTA		The description for this metric is currently not defined.
txPacketDiscards	(txPacketDiscards/NUM) DELTA		The description for this metric is currently not defined.
txPacketDiscards since Baseline	(txPacketDiscards/NUM) BASELINEDELTA		The description for this metric is currently not defined.
rxPacketDiscards	(rxPacketDiscards/NUM) DELTA		The description for this metric is currently not defined.
rxPacketDiscards since Baseline	(rxPacketDiscards/NUM) BASELINEDELTA		The description for this metric is currently not defined.

Table 37
Component: EM/ LP/

Name	Formula	Meaning
CPU Utilization (%)	(cpuUtil/NUM)	CPU utilization.
Fast Ram Memory Utilization (%)	(memoryUsage[0]/NUM) (memoryCapacity[0]/NUM) PERCENT	Fast ram memory utilization.
Normal Ram Memory Utilization (%)	(memoryUsage[1]/NUM) (memoryCapacity[1]/NUM) PERCENT	Normal ram memory utilization.
Shared Ram Memory Utilization (%)	(memoryUsage[2]/NUM) (memoryCapacity[2]/NUM) PERCENT	Shared ram memory utilization.

(Sheet 1 of 2)

Table 37 (continued)
Component: EM/ LP/

Name	Formula	Meaning
Shared Msg Block Utilization (%)	(sharedMsgBlockUsage/NUM) (sharedMsgBlockCapacity/NUM) PERCENT	Shared message block utilization.
Local Msg Block Utilization (%)	(localMsgBlockUsage/NUM) (localMsgBlockCapacity/NUM) PERCENT	Local message block utilization.
(Sheet 2 of 2)		

Table 38
Component: EM/ LP/ ARU/

Name	Formula	Meaning
Tx Cell Block Util (%)	(txCellBlockUsage/NUM) (txCellBlockCapacity/NUM) PERCENT	Sending cell block utilization.
Rx Cell Block Util (%)	(rxCellBlockUsage/NUM) (rxCellBlockCapacity/NUM) PERCENT	Receiving cell block utilization.
Tx Frame Block Util (%)	(txFrameBlockUsage/NUM) (txFrameBlockCapacity/NUM) PERCENT	Sending frame block utilization.
Rx Frame Block Util (%)	(rxFrameBlockUsage/NUM) (rxFrameBlockCapacity/NUM) PERCENT	Receiving frame block utilization.

Table 39
Component: EM/ LP/ DS1/

Name	Formula		Meaning
CRC Errors	(crcErrors/NUM)	DELTA	Number of CRC errors since last probe.
CRC Errors since Baseline	(crcErrors/NUM) BASELINEDELTA		Number of CRC errors since the last baseline reset.
(Sheet 1 of 2)			

Table 39 (continued)
Component: EM/ LP/ DS1/

Name	Formula		Meaning
Frame Errors	(frameErrors/NUM) DELTA		Number of frame errors since last probe.
Frame Errors since Baseline	(frameErrors/NUM) BASELINEDELTA (frmErrors/NUM) BASELINEDELTA	ADD	Number of frame errors since the last baseline reset.
SLIP Errors	(slipErrors/NUM)	DELTA	Number of SLIP errors since last probe.
SLIP Errors since Baseline	(slipErrors/NUM) BASELINEDELTA		Number of SLIP errors since the last baseline reset.

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Table 40
Component: EM/ LP/ DS1/ CHAN/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 41
Component: EM/ LP/ DS3/

Name	Formula	Meaning
Line Failures	(lineFailures/NUM) DELTA	Number of line failures since last probe.
Line Failures since Baseline	(lineFailures/NUM) BASELINEDELTA	Number of line failures since the last baseline reset.

(Sheet 1 of 2)

Table 41 (continued)
Component: EM/ LP/ DS3/

Name	Formula	Meaning
Path Failures	(pathFailures/NUM) DELTA	Number of path failures since last probe.
Path Failures since Baseline	(pathFailures/NUM) BASELINEDELTA	Number of path failures since the last baseline reset.

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Table 42
Component: EM/ LP/ DS3/ CBIT

Name	Formula	Meaning
C bit Error Free Second	(cbitErrorFreeSec/NUM) DELTA	Number of seconds that the DS3 port has not suffered any C Bit errors.
C bit Error Free Second since Baseline	(cbitErrorFreeSec/NUM) BASELINEDELTA	Number of seconds that the DS3 port has not suffered any C Bit errors, since the last baseline reset.
C bit code violations	(cbitCodeViolations/NUM) DELTA SECONDS DIVIDE	Rate of C bit code violdations since last probe.
C bit code violations since Baseline	(cbitCodeViolations/NUM) BASELINEDELTA	Number of C bit code violdations since the last baseline reset.
C bit Errors Second	(cbitErroredSec/NUM) DELTA	Number of seconds sufferred from C Bit Parity Errored.
C bit Errors Second since Baseline	(cbitErroredSec/NUM) BASELINEDELTA	Number of seconds sufferred from C Bit Parity Errored, since the last baseline reset.
C bit Severe Error Second	(cbitSevErroredSec/NUM) DELTA	Number of seconds suffered C bit severe errors.
C bit Severe Error Second since Baseline	(cbitSevErroredSec/NUM) BASELINEDELTA	Number of seconds suffered C bit severe errors, since the last baseline reset.

(Sheet 1 of 2)

Table 42 (continued)
Component: EM/ LP/ DS3/ CBIT

Name	Formula	Meaning
C bit Unavailable Second	(cbitUnavailSec/NUM) DELTA	Number of seconds which DS3 is unavailable.
C bit Unavailable Second since Baseline	(cbitUnavailSec/NUM) BASELINEDELTA	Number of seconds which DS3 is unavailable since the last baseline reset.
(Sheet 2 of 2)		

Table 43
Component: EM/ LP/ DS3/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 44
Component: EM/ LP/ DS3/ DS1/ CHAN/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 45
Component: EM/ LP/ E1/

Name	Formula		Meaning
CRC Errors	(crcErrors/NUM)	DELTA	Number of CRC errors since last probe.
CRC Errors since Baseline	(crcErrors/NUM) BASELINEDELTA		Number of CRC errors since the last baseline reset.
Frame Errors	(frameErrors/NUM) DELTA		Number of frame errors since last probe.
Frame Errors since Baseline	(frameErrors/NUM) BASELINEDELTA (frmErrors/NUM) BASELINEDELTA	ADD	Number of frame errors since the last baseline reset.
SLIP Errors	(slipErrors/NUM)	DELTA	Number of SLIP errors since last probe.
SLIP Errors since Baseline	(slipErrors/NUM) BASELINEDELTA		Number of SLIP errors since the last baseline reset.

Table 46
Component: EM/ LP/ E1/ CHAN/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 47
Component: EM/ LP/ E3/

Name	Formula	Meaning
Line Failures	(lineFailures/NUM) DELTA	Number of line failures since last probe.
Line Failures since Baseline	(lineFailures/NUM) BASELINEDELTA	Number of line failures since the last baseline reset.
Path Failures	(pathFailures/NUM) DELTA	Number of path failures since last probe.
Path Failures since Baseline	(pathFailures/NUM) BASELINEDELTA	Number of path failures since the last baseline reset.

Table 48
Component: EM/ LP/ E3/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 49
Component: EM/ LP/ ENET/

Name	Formula		Meaning
Alignment Errors	(alignmentErrors/NUM) DELTA		Number of alignment errors since last probe.
Alignment Errors since Baseline	(alignmentErrors/NUM) BASELINEDELTA		Number of alignment errors since the last baseline reset.
FCS Errors	(fcsErrors/NUM)	DELTA	Number of FCS errors since last probe.
(Sheet 1 of 3)			

Table 49 (continued)
Component: EM/ LP/ ENET/

Name	Formula	Meaning
FCS Errors since Baseline	(fcsErrors/NUM) BASELINEDELTA	Number of FCS errors since the last baseline reset.
Single Collision Frames	(singleCollisionFrames/NUM) DELTA	Number of single frame collisions since last probe.
Single Collision Frames since Baseline	(singleCollisionFrames/NUM) BASELINEDELTA	Number of single frame collisions since the last baseline reset.
Multiple Collision Frames	(multipleCollisionFrames/NUM) DELTA	Number of multiple frame collisions since last probe.
Multiple Collision Frames since Baseline	(multipleCollisionFrames/NUM) BASELINEDELTA	Number of multiple frame collisions since the last baseline reset.
SQE Test Errors	(sqeTestErrors/NUM) DELTA	Number of SQE test errors since last probe.
SQE Test Errors since Baseline	(sqeTestErrors/NUM) BASELINEDELTA	Number of SQE test errors since the last baseline reset.
Deferred Transmissions	(deferredTransmissions/NUM) DELTA	Number of deferred transmissions since last probe.
Deferred Transmissions since Baseline	(deferredTransmissions/NUM) BASELINEDELTA	Number of deferred transmissions since the last baseline reset.
Late Collisions	(lateCollisions/NUM) DELTA	Number of late collisions since last probe.
Late Collisions since Baseline	(lateCollisions/NUM) BASELINEDELTA	Number of late collisions since the last baseline reset.
Excessive Collisions	(excessiveCollisions/NUM) DELTA	Number of excessive collisions since last probe.
Excessive Collisions since Baseline	(excessiveCollisions/NUM) BASELINEDELTA	Number of excessive collisions since the last baseline reset.

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Table 49 (continued)
Component: EM/ LP/ ENET/

Name	Formula	Meaning
MAC Transmit Errors	(macTransmitErrors/NUM) DELTA	Number of mac transmit errors since last probe.
MAC Transmit Errors since Baseline	(macTransmitErrors/NUM) BASELINEDELTA	Number of mac transmit errors since the last baseline reset.
Carrier Sense Errors	(carrierSenseErrors/NUM) DELTA	Number of carrier sense errors since last probe.
Carrier Sense Errors since Baseline	(carrierSenseErrors/NUM) BASELINEDELTA	Number of carrier sense errors since the last baseline reset.
Frame Size Errors	(frameTooLongs/NUM) DELTA	Number of frame size errors since last probe.
Frame Size Errors since Baseline	(frameTooLongs/NUM) BASELINEDELTA	Number of frame size errors since the last baseline reset.
MAC Receive Errors	(macReceiveErrors/NUM) DELTA	Number of mac receive errors since last probe.
MAC Receive Errors since Baseline	(macReceiveErrors/NUM) BASELINEDELTA	Number of mac receive errors since the last baseline reset.

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Table 50
Component: EM/ LP/ ENG AALIST

Name	Formula	Meaning
Rx Alarm	(alarmsRx/NUM)	Number of active alarms received from the LP.
Discarded Alarm	(alarmsDiscarded/NUM)	Number of active alarms discarded from the LP.

(Sheet 1 of 2)

Table 50 (continued)
Component: EM/ LP/ ENG AALIST

Name	Formula	Meaning
Current List Size	(currentListSize/NUM)	Number of active alarms stored on this LP.
Peak List Size	(peakListSize/NUM)	Indicates the maximum number of active alarms received on the LP since it last came up.
(Sheet 2 of 2)		

Table 51
Component: EM/ LP/ ENG HGS

Name	Formula	Meaning
Hunts per second	(huntAttempts/NUM) DELTA SECONDS DIVIDE	Number of hunt group hunt, since last probe.
Hunts since Baseline	(huntAttempts/NUM) BASELINEDELTA	Number of hunt group hunt since the last baseline reset.

Table 52
Component: EM/ LP/ ETHERNET/

Name	Formula	Meaning
Frames Transmitted Ok	(framesTransmittedOk/NUM) DELTA	Number of frames transmitted Ok since last probe.
Frames Transmitted Ok since Baseline	(framesTransmittedOk/NUM) BASELINEDELTA	Number of frames transmitted Ok since the last baseline reset.
Frames Received Ok	(framesReceivedOk/NUM) DELTA	Number of frames received Ok since last probe.
Frames Received Ok since Baseline	(framesReceivedOk/NUM) BASELINEDELTA	Number of frames received Ok since the last baseline reset.
(Sheet 1 of 3)		

Table 52 (continued)
Component: EM/ LP/ ETHERNET/

Name	Formula		Meaning
Octets Transmitted Ok	(octetsTransmittedOk/NUM) DELTA		Number of octets transmitted Ok since last probe.
Octets Transmitted Ok since Baseline	(octetsTransmittedOk/NUM) BASELINEDELTA		Number of octets transmitted Ok since the last baseline reset.
Octets Received Ok	(octetsReceivedOk/NUM) DELTA		Number of octets received Ok since last probe.
Octets Received Ok since Baseline	(octetsReceivedOk/NUM) BASELINEDELTA		Number of octets received Ok since the last baseline reset.
Undersize Frames	(undersizeFrames/NUM) DELTA		Number of undersize frames since last probe.
Undersize Frames since Baseline	(undersizeFrames/NUM) BASELINEDELTA		Number of undersize frames since the last baseline reset.
Fragments	(fragments/NUM)	DELTA	Number of fragments since last probe.
Fragments since Baseline	(fragments/NUM) BASELINEDELTA		Number of fragments since the last baseline reset.
Frames Too Long	(framesTooLong/NUM) DELTA		Number of frames too long since last probe.
Frames Too Long since Baseline	(framesTooLong/NUM) BASELINEDELTA		Number of frames too long since the last baseline reset.
Jabbers	(jabbers/NUM)	DELTA	Number of jabbers since last probe.
Jabbers since Baseline	(jabbers/NUM) BASELINEDELTA		Number of jabbers since the last baseline reset.
FCS Errors	(fcsErrors/NUM)	DELTA	Number of FCS errors since last probe.
FCS Errors since Baseline	(fcsErrors/NUM) BASELINEDELTA		Number of FCS errors since the last baseline reset.
Symbol Errors	(symbolErrors/NUM) DELTA		Number of symbol errors since last probe.

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Table 52 (continued)
Component: EM/ LP/ ETHERNET/

Name	Formula	Meaning
Symbol Errors since Baseline	(symbolErrors/NUM) BASELINEDELTA	Number of symbol errors since the last baseline reset.
Pause Frames Received	(pauseFramesReceived/NUM) DELTA	Number of pause frames received since last probe.
Pause Frames Received since Baseline	(pauseFramesReceived/NUM) BASELINEDELTA	Number of pause frames received since the last baseline reset.
(Sheet 3 of 3)		

Table 53
Component: EM/ LP/ IMA/

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.
Failures	(failures/NUM) DELTA	Number of failures that the link has experienced during link addition or normal operation.
Failures since Baseline	(failures/NUM) BASELINEDELTA	Number of failures that the link has experienced during link addition or normal operation, since the last baseline reset.

Table 54
Component: EM/ LP/ JT2/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 55
Component: EM/ LP/ SDH/

Name	Formula	Meaning
Error Free Sec	(errorFreeSec/NUM) DELTA	Number of seconds that the Sonet/Sdh component has been in a near error-free state.
Error Free Sec since Baseline	(errorFreeSec/NUM) BASELINEDELTA	Number of seconds that the Sonet/Sdh component has been in a near error-free state, since the last baseline reset.
Section Code Violations	(sectCodeViolations/NUM) DELTA	Total number of Section Code Violations.
Section Code Violations since Baseline	(sectCodeViolations/NUM) BASELINEDELTA	Total number of Section Code Violations, since the last baseline reset.
Section Error Sec	(sectErroredSec/NUM) DELTA	Total number of Section Error Seconds.
Section Error Sec since Baseline	(sectErroredSec/NUM) BASELINEDELTA	Total number of Section Error Seconds, since the last baseline reset.
Section Severe Error Sec	(sectSevErroredSec/NUM) DELTA	Total number of Section Severely Errored Seconds.
(Sheet 1 of 3)		

Table 55 (continued)
Component: EM/ LP/ SDH/

Name	Formula	Meaning
Section Severe Error Sec since Baseline	(sectSevErroredSec/NUM) BASELINEDELTA	Total number of Section Severely Errored Seconds, since the last baseline reset.
Section Los Sec	(sectLosSec/NUM) DELTA	Total number of section LOS seconds.
Section Los Sec since Baseline	(sectLosSec/NUM) BASELINEDELTA	Total number of section LOS seconds, since the last baseline reset.
Section Severe Error Frame Sec	(sectSevErroredFrmSec/NUM) DELTA	Total number of Section Severely Errored Frame Seconds.
Section Severe Error Frame Sec since Baseline	(sectSevErroredFrmSec/NUM) BASELINEDELTA	Total number of Section Severely Errored Frame Seconds, since the last baseline reset.
Section Failures	(sectFailures/NUM) DELTA	Total number of times a section failure (LOS or LOF) occurs.
Section Failures since Baseline	(sectFailures/NUM) BASELINEDELTA	Total number of times a section failure (LOS or LOF) occurs since the last baseline reset.
Line Code Violations	(lineCodeViolations/NUM) DELTA	Total number of Line Code Violations.
Line Code Violations since Baseline	(lineCodeViolations/NUM) BASELINEDELTA	Total number of Line Code Violations since the last baseline reset.
Line Errored Sec	(lineErroredSec/NUM) DELTA	Total number of Line Errored Seconds.
Line Errored Sec since Baseline	(lineErroredSec/NUM) BASELINEDELTA	Total number of Line Errored Seconds since the last baseline reset.

(Sheet 2 of 3)

Table 55 (continued)
Component: EM/ LP/ SDH/

Name	Formula	Meaning
Line Severe Errored Sec	(lineSevErroredSec/NUM) DELTA	Total number of Line Severely Errored Seconds.
Line Severe Errored Sec since Baseline	(lineSevErroredSec/NUM) BASELINEDELTA	Total number of Line Severely Errored Seconds since the last baseline reset.
Line Ais Sec	(lineAisSec/NUM)	Total number of Line AIS Seconds.
Line Unavailable Sec	(lineUnavailSec/NUM)	Total number of one-second intervals for which the STS line is unavailable.
Line Failures	(lineFailures/NUM) DELTA	Total number of times that a line failure (L-AIS) occurs.
Line Failures since Baseline	(lineFailures/NUM) BASELINEDELTA	Total number of times that a line failure (L-AIS) occurs, since the last baseline reset.

(Sheet 3 of 3)

Table 56
Component: EM/ LP/ SDH/ PATH/

Name	Formula	Meaning
Path Error Free Sec	(pathErrorFreeSec/NUM) DELTA	Number of seconds that the Sonet/SDH/ PATH component has been in a near error-free state.
Path Error Free Sec since Baseline	(pathErrorFreeSec/NUM) BASELINEDELTA	Number of seconds that the Sonet/SDH/ PATH component has been in a near error-free state, since the last baseline reset.
Path Code Violations	(pathCodeViolations/NUM) DELTA	Number of path code violations.

(Sheet 1 of 2)

Table 56 (continued)
Component: EM/ LP/ SDH/ PATH/

Name	Formula	Meaning
Path Code Violations since Baseline	(pathCodeViolations/NUM) BASELINEDELTA	Number of path code violations since the last baseline reset.
Path Errored Sec	(pathErroredSec/NUM) DELTA	Number of path errored seconds.
Path Errored Sec since Baseline	(pathErroredSec/NUM) BASELINEDELTA	Number of path errored seconds, since the last baseline reset.
Path Severe Errored Sec	(pathSevErroredSec/NUM) DELTA	Number of path severe errored seconds.
Path Severe Errored Sec since Baseline	(pathSevErroredSec/NUM) BASELINEDELTA	Number of path severe errored seconds, since the last baseline reset.
Path Ais Lop Sec	(pathAisLopSec/NUM) DELTA	Number of path AIS and LOP seconds.
Path Ais Lop Sec since Baseline	(pathAisLopSec/NUM) BASELINEDELTA	Number of path AIS and LOP seconds, since the last baseline reset.
Path Unavailable Sec	(pathUnavailSec/NUM) DELTA	Number of one-second intervals for which the STS/ STM path is unavailable.
Path Unavailable Sec since Baseline	(pathUnavailSec/NUM) BASELINEDELTA	Number of one-second intervals for which the STS/ STM path is unavailable, since the last baseline reset.

(Sheet 2 of 2)

Table 57
Component: EM/ LP/ SDH/ PATH/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 58
Component: EM/ LP/ SONET/

Name	Formula	Meaning
Error Free Sec	(errorFreeSec/NUM) DELTA	Number of seconds that the Sonet/Sdh component has been in a near error-free state.
Error Free Sec since Baseline	(errorFreeSec/NUM) BASELINEDELTA	Number of seconds that the Sonet/Sdh component has been in a near error-free state, since the last baseline reset.
Section Code Violations	(sectCodeViolations/NUM) DELTA	Total number of Section Code Violations.
Section Code Violations since Baseline	(sectCodeViolations/NUM) BASELINEDELTA	Total number of Section Code Violations since the last baseline reset.
Section Error Sec	(sectErroredSec/NUM) DELTA	Total number of Section Error Seconds.
Section Error Sec since Baseline	(sectErroredSec/NUM) BASELINEDELTA	Total number of Section Error Seconds since the last baseline reset.
Section Severe Error Sec	(sectSevErroredSec/NUM) DELTA	Total number of Section Severely Errored Seconds.
(Sheet 1 of 3)		

Table 58 (continued)
Component: EM/ LP/ SONET/

Name	Formula	Meaning
Section Severe Error Sec since Baseline	(sectSevErroredSec/NUM) BASELINEDELTA	Total number of Section Severely Errored Seconds since the last baseline reset.
Section Los Sec	(sectLosSec/NUM) DELTA	Total number of section LOS seconds.
Section Los Sec since Baseline	(sectLosSec/NUM) BASELINEDELTA	Total number of section LOS seconds since the last baseline reset.
Section Severe Error Frame Sec	(sectSevErroredFrmSec/NUM) DELTA	Total number of Section Severely Errored Frame Seconds.
Section Severe Error Frame Sec since Baseline	(sectSevErroredFrmSec/NUM) BASELINEDELTA	Total number of Section Severely Errored Frame Seconds since the last baseline reset.
Section Failures	(sectFailures/NUM) DELTA	Total number of times a section failure (LOS or LOF) occurs.
Section Failures since Baseline	(sectFailures/NUM) BASELINEDELTA	Total number of times a section failure (LOS or LOF) occurs since the last baseline reset.
Line Code Violations	(lineCodeViolations/NUM) DELTA	Total number of Line Code Violations.
Line Code Violations since Baseline	(lineCodeViolations/NUM) BASELINEDELTA	Total number of Line Code Violations since the last baseline reset.
Line Errored Sec	(lineErroredSec/NUM) DELTA	Total number of Line Errored Seconds.
Line Errored Sec since Baseline	(lineErroredSec/NUM) BASELINEDELTA	Total number of Line Errored Seconds since the last baseline reset.

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Table 58 (continued)
Component: EM/ LP/ SONET/

Name	Formula	Meaning
Line Severe Errored Sec	(lineSevErroredSec/NUM) DELTA	Total number of Line Severely Errored Seconds.
Line Severe Errored Sec since Baseline	(lineSevErroredSec/NUM) BASELINEDELTA	Total number of Line Severely Errored Seconds since the last baseline reset.
Line Ais Sec	(lineAisSec/NUM) DELTA	Total number of Line AIS Seconds.
Line Ais Sec since Baseline	(lineAisSec/NUM) BASELINEDELTA	Total number of Line AIS Seconds since the last baseline reset.
Line Unavailable Sec	(lineUnavailSec/NUM) DELTA	Total number of one-second intervals for which the STS line is unavailable.
Line Unavailable Sec since Baseline	(lineUnavailSec/NUM) BASELINEDELTA	Total number of one-second intervals for which the STS line is unavailable, since the last baseline reset.
Line Failures	(lineFailures/NUM) DELTA	Total number of times that a line failure (L-AIS) occurs.
Line Failures since Baseline	(lineFailures/NUM) BASELINEDELTA	Total number of times that a line failure (L-AIS) occurs, since the last baseline reset.

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Table 59
Component: EM/ LP/ SONET/ PATH/

Name	Formula	Meaning
Path Error Free Sec	(pathErrorFreeSec/NUM) DELTA	Number of seconds that the Sonet/SDH/ PATH component has been in a near error-free state.
Path Error Free Sec since Baseline	(pathErrorFreeSec/NUM) BASELINEDELTA	Number of seconds that the Sonet/SDH/ PATH component has been in a near error-free state, since the last baseline reset.
Path Code Violations	(pathCodeViolations/NUM) DELTA	Number of path code violations.
Path Code Violations since Baseline	(pathCodeViolations/NUM) BASELINEDELTA	Number of path code violations since the last baseline reset.
Path Errored Sec	(pathErroredSec/NUM) DELTA	Number of path errored seconds.
Path Errored Sec since Baseline	(pathErroredSec/NUM) BASELINEDELTA	Number of path errored seconds, since the last baseline reset.
Path Severe Errored Sec	(pathSevErroredSec/NUM) DELTA	Number of path severe errored seconds.
Path Severe Errored Sec since Baseline	(pathSevErroredSec/NUM) BASELINEDELTA	Number of path severe errored seconds, since the last baseline reset.
Path Ais Lop Sec	(pathAisLopSec/NUM) DELTA	Number of path AIS and LOP seconds.
Path Ais Lop Sec since Baseline	(pathAisLopSec/NUM) BASELINEDELTA	Number of path AIS and LOP seconds, since the last baseline reset.

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Table 59 (continued)
Component: EM/ LP/ SONET/ PATH/

Name	Formula	Meaning
Path Unavailable Sec	(pathUnavailSec/NUM) DELTA	Number of one-second intervals for which the STS/ STM path is unavailable.
Path Unavailable Sec since Baseline	(pathUnavailSec/NUM) BASELINEDELTA	Number of one-second intervals for which the STS/ STM path is unavailable, since the last baseline reset.
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Table 60
Component: EM/ LP/ SONET/ PATH/ CELL

Name	Formula	Meaning
Rx Cell Util	(receiveCellUtilization/NUM)	Ratio of number of valid assigned cells received on link to nominal capacity.
Tx Cell Util	(transmitCellUtilization/NUM)	Ratio of number of valid assigned cells transmitted on link to nominal capacity.

Table 61
Component: EM/ MPANL/

Name	Formula		Meaning
Frames per second Sent	(frmToIf/NUM) SECONDS	DELTA DIVIDE	Number of frames sent per second since last probe.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA		Number of frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) SECONDS	DELTA DIVIDE	Number of frames received per second since last probe.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA		Number of frames received since the last baseline reset.
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Table 61 (continued)
Component: EM/ MPANL/

Name	Formula	Meaning
Kilobytes per second Sent	(octetToIf/NUM) DELTA SECONDS DIVIDE 1000 DIVIDE	Number of kilobytes sent per second since last probe.
Kilobytes Sent since Baseline	(octetToIf/NUM) BASELINEDELTA 1000 DIVIDE	Number of kilobytes sent since the last baseline reset.
Kilobytes per second Received	(octetFromIf/NUM) DELTA SECONDS DIVIDE 1000 DIVIDE	Number of kilobytes received per second since last probe.
Kilobytes Received since Baseline	(octetFromIf/NUM) BASELINEDELTA 1000 DIVIDE	Number of kilobytes received since the last baseline reset.
Frame Header Format Errors	(invalidHeaderFramesFromIf/ NUM) DELTA	Number of frames with invalid headers since last probe.
Frame Header Format Errors since Baseline	(invalidHeaderFramesFromIf/ NUM) BASELINEDELTA	Number of frames with invalid headers since the last baseline reset.
Unknown DLCI Errors	(unknownDlciFramesFromIf/NUM) DELTA	Number of frames with unknown DLCI since last probe.
Unknown DLCI Errors since Baseline	(unknownDlciFramesFromIf/NUM) BASELINEDELTA	Number of frames with unknown DLCI since the last baseline reset.
Last Unknown DLCI	(lastUnknownDlci/NUM)	DLCI of the last unknown DLCI frame.

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Table 62
Component: EM/ MPANL/ FRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames per second Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA	Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA	Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA	Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM) DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA	Number of aborted frames since the last baseline reset.

Table 63
Component: EM/ MPANL/ SIGMPANL

Name	Formula	Meaning
Protocol Errors	(protocolErrors/NUM) DELTA	Number of protocol error reports sent since last probe.
Protocol Errors since Baseline	(protocolErrors/NUM) BASELINEDELTA	Number of protocol error reports sent since the last baseline reset.
SAP 0 Commands Sent	(sap0CommandsTx/NUM) DELTA	Number of SAP-0 commands sent since last probe.
SAP 0 Commands Sent since Baseline	(sap0CommandsTx/NUM) BASELINEDELTA	Number of SAP-0 commands sent since the last baseline reset.
SAP 0 Commands Received	(sap0CommandsRx/NUM) DELTA	Number of SAP-0 commands received since last probe.
SAP 0 Commands Received since Baseline	(sap0CommandsRx/NUM) BASELINEDELTA	Number of SAP-0 commands received since the last baseline reset.
SAP X Commands Sent	(sapXCommandsTx/NUM) DELTA	Number of SAP X commands sent since last probe.
SAP X Commands Sent since Baseline	(sapXCommandsTx/NUM) BASELINEDELTA	Number of SAP X commands sent since the last baseline reset.
SAP X Commands Received	(sapXCommandsRx/NUM) DELTA	Number of SAP X commands receivd since last probe.
SAP X Commands Received since Baseline	(sapXCommandsRx/NUM) BASELINEDELTA	Number of SAP X commands receivd since the last baseline reset.

Table 64
Component: EM/ PCGTL/ NSE/

Name	Formula	Meaning
Oct From Sgsn	(octetsFromSgsn/NUM) DELTA SECONDS DIVIDE	The description for this metric is currently not defined.
Oct From Sgsn since Baseline	(octetsFromSgsn/NUM) BASELINEDELTA	The description for this metric is currently not defined.
Oct To Sgsn	(octetsToSgsn/NUM) DELTA SECONDS DIVIDE	The description for this metric is currently not defined.
Oct To Sgsn since Baseline	(octetsToSgsn/NUM) BASELINEDELTA	The description for this metric is currently not defined.

Table 65
Component: EM/ PPP/ FRAMER

Name	Formula	Meaning
Frames per second Sent	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames Received since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
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Table 65 (continued)
Component: EM/ PPP/ FRAMER

Name	Formula		Meaning
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA		Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA		Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA		Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM)	DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA		Number of aborted frames since the last baseline reset.

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Table 66
Component: EM/ RTR/

Name	Formula	Meaning
Input Datagrams Received	(inReceives/NUM) DELTA	The number of input datagrams received from the interfaces, including those received in error since the last probe.
Input Datagrams Received since Baseline	(inReceives/NUM) BASELINEDELTA	The number of input datagrams received from the interfaces, including those received in error since the last baseline reset.
Invalid Address Errors Discarded	(inAddrErrors/NUM) DELTA	The number of input datagrams discarded due to errors such as invalid address, unsupported address class since the last probe.

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Table 66 (continued)
Component: EM/ RTR/

Name	Formula	Meaning
Invalid Address Errors Discarded since Baseline	(inAddrErrors/NUM) BASELINEDELTA	The number of input datagrams discarded due to errors such as invalid address, unsupported address class since the last baseline reset.
Invalid Header Errors Discarded	(inHdrErrors/NUM) DELTA	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc since the last probe.
Invalid Header Errors Discarded since Baseline	(inHdrErrors/NUM) BASELINEDELTA	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc since the last baseline reset.
Input Datagrams Discarded	(inDiscards/NUM) DELTA	The number of input datagrams for which no problems were encountered to prevent their continued processing, but which were discarded due to the lack of buffers since the last probe. This does not include any datagram discarded while awaiting for re-asembly.

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Table 66 (continued)
Component: EM/ RTR/

Name	Formula		Meaning
Input Datagrams Discarded since Baseline	(inDiscards/NUM) BASELINEDELTA		The number of input datagrams for which no problems were encountered to prevent their continued processing, but which were discarded due to the lack of buffers since the last baseline reset. This does not include any datagram discarded while awaiting for re-asembly.
Input Datagrams Delivered	(inDelivers/NUM)	DELTA	The number of input datagrams successfully delivered to IP user- protocols (including ICMP) since the last probe.
Input Datagrams Delivered since Baseline	(inDelivers/NUM) BASELINEDELTA		The number of input datagrams successfully delivered to IP user- protocols (including ICMP) since the last baseline reset.
Out Requests	(outRequests/NUM) DELTA		The number of datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission since the last probe.
Out Requests since Baseline	(outRequests/NUM) BASELINEDELTA		The number of datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission since the last baseline reset.
Out Discards	(outDiscards/NUM) DELTA		The number of outbound datagrams that were discarded due to the lack of buffers since the last probe.

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Table 66 (continued)
Component: EM/ RTR/

Name	Formula	Meaning
Out Discards since Baseline	(outDiscards/NUM) BASELINEDELTA	The number of outbound datagrams that were discarded due to the lack of buffers since the last baseline reset.
No Route Out Discards	(outNoRoutes/NUM) DELTA	The number of outbound datagrams discarded because no route could be found to transmit them to their destination since the last probe.
No Route Out Discards since Baseline	(outNoRoutes/NUM) BASELINEDELTA	The number of outbound datagrams discarded because no route could be found to transmit them to their destination since the last baseline reset.
Routing Discards	(routingDiscards/NUM) DELTA	The number of routing entries which were chosen to be discarded even though they are valid since the last probe.
Routing Discards since Baseline	(routingDiscards/NUM) BASELINEDELTA	The number of routing entries which were chosen to be discarded even though they are valid since the last baseline reset.

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Table 67
Component: EM/ RTR/ IF/

Name	Formula		Meaning
In Octets	(ifInOctets/NUM)	DELTA	Number of octets received on the interface, including framing characters, in 32-bit.
In Octets since Baseline	(ifInOctets/NUM) BASELINEDELTA		Number of octets received on the interface, including framing characters, since the last baseline reset, in 32-bit.
In Octets (64-bit)	(ifHCInOctets/NUM) DELTA		Number of octets received on the interface, including framing characters, in 64-bit.
In Octets since Baseline (64-bit)	(ifHCInOctets/NUM) BASELINEDELTA		Number of octets received on the interface, including framing characters, since the last baseline reset, in 64-bit.
Out Octets	(ifOutOctets/NUM) DELTA		Number of octets transmitted out the interface, including framing characters, in 32-bit.
Out Octets since Baseline	(ifOutOctets/NUM) BASELINEDELTA		Number of octets transmitted out the interface, including framing characters, since the last baseline reset, in 32-bit.
Out Octets (64-bit)	(ifHCOutOctets/NUM) DELTA		Number of octets transmitted out the interface, including framing characters, in 64-bit.
Out Octets since Baseline (64-bit)	(ifHCOutOctets/NUM) BASELINEDELTA		Number of octets transmitted out the interface, including framing characters, since the last baseline reset, in 64-bit.
In Discards	(ifInDiscards/NUM) DELTA		Number of inbound packets discarded even though no errors detected. Prevents the packets from being delivered to a higher layer protocol.

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Table 67 (continued)
Component: EM/ RTR/ IF/

Name	Formula	Meaning
In Discards since Baseline	(ifInDiscards/NUM) BASELINEDELTA	Number of inbound packets discarded even though no errors detected since the last baseline reset. Prevents the packets from being delivered to a higher layer protocol.
Out Discards	(ifOutDiscards/NUM) DELTA	Number of outbound packets discarded even though no errors detected. Prevents the packets from being transmitted.
Out Discards since Baseline	(ifOutDiscards/NUM) BASELINEDELTA	Number of outbound packets discarded even though no errors detected since the last baseline reset. Prevents the packets from being transmitted.
In Ucast Pkts	(ifInUcastPkts/NUM) DELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol, in 32-bit.
In Ucast Pkts since Baseline	(ifInUcastPkts/NUM) BASELINEDELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol since the last baseline reset, in 32-bit.
In Ucast Pkts (64-bit)	(ifHCInUcastPkts/NUM) DELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol, in 64-bit.
In Ucast Pkts since Baseline (64-bit)	(ifHCInUcastPkts/NUM) BASELINEDELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol since the last baseline reset, in 64-bit.

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Table 67 (continued)
Component: EM/ RTR/ IF/

Name	Formula	Meaning
Out Ucast Pkts	(ifOutUcastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address. Includes discarded and unsent packets, in 32-bit.
Out Ucast Pkts since Baseline	(ifOutUcastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address, since the last baseline reset. Includes discarded and unsent packets, in 32-bit.
Out Ucast Pkts (64-bit)	(ifHCOutUcastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address. Includes discarded and unsent packets, in 64-bit.
Out Ucast Pkts since Baseline (64-bit)	(ifHCOutUcastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address, since the last baseline reset. Includes discarded and unsent packets, in 64-bit.
In NUcast Pkts	(ifInNuCastPkts/NUM) DELTA	Number of non-unicast packets delivered to a higher layer protocol.
In NUcast Pkts since Baseline	(ifInNuCastPkts/NUM) BASELINEDELTA	Number of non-unicast packets delivered to a higher layer protocol, since the last baseline reset.

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Table 67 (continued)
Component: EM/ RTR/ IF/

Name	Formula	Meaning
Out NUcast Pkts	(ifOutNuCastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a non-unicast address. Includes discarded and unsent packets.
Out NUcast Pkts since Baseline	(ifOutNuCastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a non-unicast address, since the last baseline reset. Includes discarded and unsent packets.

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Table 68
Component: EM/ RTR/ IF/ LDPIF

Name	Formula		Meaning
In Octets Received	(inOctets/NUM)	DELTA	The number of octets received from terminating or incoming tandem MPLS data traffic since the last probe.
In Octets Received since Baseline	(inOctets/NUM) BASELINEDELTA		The number of octets received from terminating or incoming tandem MPLS data traffic since the last baseline reset.
In Frames Received	(inFrames/NUM)	DELTA	The number of frames received from terminating or incoming tandem MPLS data traffic since the last probe.

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Table 68 (continued)
Component: EM/ RTR/ IF/ LDPIF

Name	Formula		Meaning
In Frames Received since Baseline	(inFrames/NUM) BASELINEDELTA		The number of frames received from terminating or incoming tandem MPLS data traffic since the last baseline reset.
In Frames Discarded	(inFramesDiscards/NUM) DELTA		The number of frames received but discarded from terminating or incoming tandem MPLS data traffic since the last probe.
In Frames Discarded since Baseline	(inFramesDiscards/NUM) BASELINEDELTA		The number of frames received but discarded from terminating or incoming tandem MPLS data traffic since the last baseline reset.
Out Octets Received	(outOctets/NUM)	DELTA	The number of octets transmitted for originating or outgoing transit MPLS data since the last probe.
Out Octets Received since Baseline	(outOctets/NUM) BASELINEDELTA		The number of octets transmitted for originating or outgoing transit MPLS data since the last baseline reset.
Out Frames Transmitted	(outFrames/NUM) DELTA		The total number frames of transmitted since the last probe.
Out Frames Transmitted since Baseline	(outFrames/NUM) BASELINEDELTA		The total number of frames transmitted since the last baseline reset.

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Table 68 (continued)
Component: EM/ RTR/ IF/ LDPIF

Name	Formula	Meaning
Out Frames Discarded	(outFramesDiscards/NUM) DELTA	The total number frames of transmitted that were discarded since the last probe.
Out Frames Discarded since Baseline	(outFramesDiscards/NUM) BASELINEDELTA	The total number of frames transmitted that were discarded since the last baseline reset.

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Table 69
Component: EM/ RTR/ VRF/

Name	Formula	Meaning
Input Datagrams Received	(inReceives/NUM) DELTA	The number of input datagrams received from the interfaces, including those received in error since the last probe.
Input Datagrams Received since Baseline	(inReceives/NUM) BASELINEDELTA	The number of input datagrams received from the interfaces, including those received in error since the last baseline reset.
Invalid Address Errors Discarded	(inAddrErrors/NUM) DELTA	The number of input datagrams discarded due to errors such as invalid address, unsupported address class since the last probe.

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Table 69 (continued)
Component: EM/ RTR/ VRF/

Name	Formula	Meaning
Invalid Address Errors Discarded since Baseline	(inAddrErrors/NUM) BASELINEDELTA	The number of input datagrams discarded due to errors such as invalid address, unsupported address class since the last baseline reset.
Invalid Header Errors Discarded	(inHdrErrors/NUM) DELTA	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc since the last probe.
Invalid Header Errors Discarded since Baseline	(inHdrErrors/NUM) BASELINEDELTA	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc since the last baseline reset.
Input Datagrams Discarded	(inDiscards/NUM) DELTA	The number of input datagrams for which no problems were encountered to prevent their continued processing, but which were discarded due to the lack of buffers since the last probe. This does not include any datagram discarded while awaiting for re-asembly.

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Table 69 (continued)
Component: EM/ RTR/ VRF/

Name	Formula		Meaning
Input Datagrams Discarded since Baseline	(inDiscards/NUM) BASELINEDELTA		The number of input datagrams for which no problems were encountered to prevent their continued processing, but which were discarded due to the lack of buffers since the last baseline reset. This does not include any datagram discarded while awaiting for re-asembly.
Input Datagrams Delivered	(inDelivers/NUM)	DELTA	The number of input datagrams successfully delivered to IP user- protocols (including ICMP) since the last probe.
Input Datagrams Delivered since Baseline	(inDelivers/NUM) BASELINEDELTA		The number of input datagrams successfully delivered to IP user- protocols (including ICMP) since the last baseline reset.
Out Requests	(outRequests/NUM) DELTA		The number of datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission since the last probe.
Out Requests since Baseline	(outRequests/NUM) BASELINEDELTA		The number of datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission since the last baseline reset.
Out Discards	(outDiscards/NUM) DELTA		The number of outbound datagrams that were discarded due to the lack of buffers since the last probe.

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Table 69 (continued)
Component: EM/ RTR/ VRF/

Name	Formula	Meaning
Out Discards since Baseline	(outDiscards/NUM) BASELINEDELTA	The number of outbound datagrams that were discarded due to the lack of buffers since the last baseline reset.
No Route Out Discards	(outNoRoutes/NUM) DELTA	The number of outbound datagrams discarded because no route could be found to transmit them to their destination since the last probe.
No Route Out Discards since Baseline	(outNoRoutes/NUM) BASELINEDELTA	The number of outbound datagrams discarded because no route could be found to transmit them to their destination since the last baseline reset.
Routing Discards	(routingDiscards/NUM) DELTA	The number of routing entries which were chosen to be discarded even though they are valid since the last probe.
Routing Discards since Baseline	(routingDiscards/NUM) BASELINEDELTA	The number of routing entries which were chosen to be discarded even though they are valid since the last baseline reset.

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Table 70
Component: EM/ RTR/ VRF/ IF/

Name	Formula		Meaning
In Octets	(ifInOctets/NUM)	DELTA	Number of octets received on the interface, including framing characters, in 32-bit.
In Octets since Baseline	(ifInOctets/NUM) BASELINEDELTA		Number of octets received on the interface, including framing characters, since the last baseline reset, in 32-bit.
In Octets (64-bit)	(ifHCInOctets/NUM) DELTA		Number of octets received on the interface, including framing characters, in 64-bit.
In Octets since Baseline (64-bit)	(ifHCInOctets/NUM) BASELINEDELTA		Number of octets received on the interface, including framing characters, since the last baseline reset, in 64-bit.
Out Octets	(ifOutOctets/NUM) DELTA		Number of octets transmitted out the interface, including framing characters, in 32-bit.
Out Octets since Baseline	(ifOutOctets/NUM) BASELINEDELTA		Number of octets transmitted out the interface, including framing characters, since the last baseline reset, in 32-bit.
Out Octets (64-bit)	(ifHCOutOctets/NUM) DELTA		Number of octets transmitted out the interface, including framing characters, in 64-bit.
Out Octets since Baseline (64-bit)	(ifHCOutOctets/NUM) BASELINEDELTA		Number of octets transmitted out the interface, including framing characters, since the last baseline reset, in 64-bit.
In Discards	(ifInDiscards/NUM) DELTA		Number of inbound packets discarded even though no errors detected. Prevents the packets from being delivered to a higher layer protocol.

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Table 70 (continued)
Component: EM/ RTR/ VRF/ IF/

Name	Formula	Meaning
In Discards since Baseline	(ifInDiscards/NUM) BASELINEDELTA	Number of inbound packets discarded even though no errors detected since the last baseline reset. Prevents the packets from being delivered to a higher layer protocol.
Out Discards	(ifOutDiscards/NUM) DELTA	Number of outbound packets discarded even though no errors detected. Prevents the packets from being transmitted.
Out Discards since Baseline	(ifOutDiscards/NUM) BASELINEDELTA	Number of outbound packets discarded even though no errors detected since the last baseline reset. Prevents the packets from being transmitted.
In Ucast Pkts	(ifInUcastPkts/NUM) DELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol, in 32-bit.
In Ucast Pkts since Baseline	(ifInUcastPkts/NUM) BASELINEDELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol since the last baseline reset, in 32-bit.
In Ucast Pkts (64-bit)	(ifHCInUcastPkts/NUM) DELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol, in 64-bit.
In Ucast Pkts since Baseline (64-bit)	(ifHCInUcastPkts/NUM) BASELINEDELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol since the last baseline reset, in 64-bit.

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Table 70 (continued)
Component: EM/ RTR/ VRF/ IF/

Name	Formula	Meaning
Out Ucast Pkts	(ifOutUcastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address. Includes discarded and unsent packets, in 32-bit.
Out Ucast Pkts since Baseline	(ifOutUcastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address, since the last baseline reset. Includes discarded and unsent packets, in 32-bit.
Out Ucast Pkts (64-bit)	(ifHCOutUcastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address. Includes discarded and unsent packets, in 64-bit.
Out Ucast Pkts since Baseline (64-bit)	(ifHCOutUcastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address, since the last baseline reset. Includes discarded and unsent packets, in 64-bit.
In NUcast Pkts	(ifInNuCastPkts/NUM) DELTA	Number of non-unicast packets delivered to a higher layer protocol.
In NUcast Pkts since Baseline	(ifInNuCastPkts/NUM) BASELINEDELTA	Number of non-unicast packets delivered to a higher layer protocol, since the last baseline reset.

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Table 70 (continued)
Component: EM/ RTR/ VRF/ IF/

Name	Formula	Meaning
Out NUcast Pkts	(ifOutNuCastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a non-unicast address. Includes discarded and unsent packets.
Out NUcast Pkts since Baseline	(ifOutNuCastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a non-unicast address, since the last baseline reset. Includes discarded and unsent packets.

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Table 71
Component: EM/ RTR/ VRF/ IF/ ATMMPE AC/

Name	Formula		Meaning
In Packets/sec	(inPackets/NUM) DELTA SECONDS DIVIDE		Counts the total number of packets received on this connection.
In Packets since Baseline	(inPackets/NUM) BASELINEDELTA		Counts the total number of packets received on this connection since the last baseline reset.
In Octects/sec	(inOctets/NUM) DELTA SECONDS DIVIDE		Counts the total number of octets received on this connection.
In Octects since Baseline	(inOctets/NUM) BASELINEDELTA		Counts the total number of octets received on this connection since the last baseline reset.

(Sheet 1 of 3)

Table 71 (continued)
Component: EM/ RTR/ VRF/ IF/ ATMMPE AC/

Name	Formula	Meaning
In UnknownProtos/sec	(inUnknownProtos/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets received on this connection which were discarded because they contained an unknown or unsupported protocol.
In UnknownProtos since Baseline	(inUnknownProtos/NUM) BASELINEDELTA	Counts the total number of packets received on this connection which were discarded because they contained an unknown or unsupported protocol, since the last baseline reset.
In Errors/sec	(inErrors/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets received on the connection which contained errors preventing them from being delivered to a higher-layer protocol.
In Errors since Baseline	(inErrors/NUM) BASELINEDELTA	Counts the total number of packets received on the connection which contained errors preventing them from being delivered to a higher-layer protocol, since the last baseline reset.
Out Packets/sec	(outPackets/NUM) DELTA SECONDS DIVIDE	outPackets
Out Packets since Baseline	(outPackets/NUM) BASELINEDELTA	outPackets since the last baseline reset.
Out Octects/sec	(outOctets/NUM) DELTA SECONDS DIVIDE	Counts the total number of octets sent on this connection.

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Table 71 (continued)
Component: EM/ RTR/ VRF/ IF/ ATMMPE AC/

Name	Formula	Meaning
Out Octects since Baseline	(outOctets/NUM) BASELINEDELTA	Counts the total number of octets sent on this connection since the last baseline reset.
Out Discards/sec	(outDiscards/NUM) DELTA SECONDS DIVIDE	Counts the total number of packets which were supposed to be sent on this connection, but were discarded due to congestion or the connection being down.
Out Discards since Baseline	(outDiscards/NUM) BASELINEDELTA	Counts the total number of packets which were supposed to be sent on this connection, but were discarded due to congestion or the connection being down, since the last baseline reset.
(Sheet 3 of 3)		

Table 72
Component: EM/ SHELF BUS/

Name	Formula	Meaning
Bus Utilization (%)	(utilization/NUM)	Bus utilization.

Table 73
Component: EM/ SHELF BUS/ TEST

Name	Formula	Meaning
self test result(0)	(selfTestResults[0]/NUM)	Verifies the operation of a bus.
self test result(15)	(selfTestResults[15]/NUM)	Verifies the operation of a bus.
(Sheet 1 of 2)		

Table 73 (continued)
Component: EM/ SHELF BUS/ TEST

Name	Formula	Meaning
clock source test result(0..0)	(clockSourceTestResults[0,0]/ NUM)	Verifies the operation of a bus.
clock source test result(0..15)	(clockSourceTestResults[1,15]/ NUM)	Verifies the operation of a bus.
(Sheet 2 of 2)		

Table 74
Component: EM/ SHELF CARD/

Name	Formula	Meaning
CPU Utilization (%)	(cpuUtil/NUM)	Card CPU utilization.
Fast Ram Memory Utilization (%)	(memoryUsage[0]/NUM) (memoryCapacity[0]/NUM) PERCENT	Fast ram memory utilization.
Normal Ram Memory Utilization (%)	(memoryUsage[1]/NUM) (memoryCapacity[1]/NUM) PERCENT	Normal ram memory utilization.
Shared Ram Memory Utilization (%)	(memoryUsage[2]/NUM) (memoryCapacity[2]/NUM) PERCENT	Shared ram memory utilization.
Shared Msg Block Utilization (%)	(sharedMsgBlockUsage/NUM) (sharedMsgBlockCapacity/NUM) PERCENT	Shared message block utilization.
Local Msg Block Utilization (%)	(localMsgBlockUsage/NUM) (localMsgBlockCapacity/NUM) PERCENT	Local message block utilization.

Table 75
Component: EM/ SHELF FABRICCARD/

Name	Formula	Meaning
Bus Utilization (%)	(utilization/NUM)	Estimates the current fabric utilization.

Table 76
Component: EM/ TRK/

Name	Formula	Meaning
Packets/sec from Interface	(pktFromIf/NUM) DELTA SECONDS DIVIDE	Packets from interface per second.
Packets from Interface since Baseline	(pktFromIf/NUM) BASELINEDELTA	Packets from interface since the last baseline reset.
Trunk Pks/s to Interface	(trunkPktToIf/NUM) DELTA SECONDS DIVIDE	Trunk packets to interface per second.
Trunk Pks to Interface since Baseline	(trunkPktToIf/NUM) BASELINEDELTA	Trunk packets to interface since the last baseline reset.
Trunk Pks/s from Interface	(trunkPktFromIf/NUM) DELTA SECONDS DIVIDE	Trunk packets from interface per second.
Trunk Pks from Interface since Baseline	(trunkPktFromIf/NUM) BASELINEDELTA	Trunk packets from interface since the last baseline reset.
Discarded packets/sec	(discardUnforward/NUM) DELTA SECONDS DIVIDE	Discarded packets per second.
Discarded packets since Baseline	(discardUnforward/NUM) BASELINEDELTA	Discarded packets since the last baseline reset.
Round trip delay (ms / 10)	(measuredRoundTripDelay/NUM)	Round trip delay in millisecond measured by the trunk or DPN Gateway.

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Table 76 (continued)
Component: EM/ TRK/

Name	Formula	Meaning
Packet/sec from Interface EP equals 0	(pktFromIfByPrio[0]/NUM) DELTA SECONDS DIVIDE	Packets with priority 0 from interface per second.
Packet from Interface EP equals 0 since Baseline	(pktFromIfByPrio[0]/NUM) BASELINEDELTA	Packets with priority 0 from interface since the last baseline reset.
Packet/sec from Interface EP equals 1	(pktFromIfByPrio[1]/NUM) DELTA SECONDS DIVIDE	Packets with priority 1 from interface per second.
Packet from Interface EP equals 1 since Baseline	(pktFromIfByPrio[1]/NUM) BASELINEDELTA	Packets with priority 1 from interface since the last baseline reset.
Packet/sec from Interface EP equals 2	(pktFromIfByPrio[2]/NUM) DELTA SECONDS DIVIDE	Packets with priority 2 from interface per second.
Packet from Interface EP equals 2 since Baseline	(pktFromIfByPrio[2]/NUM) BASELINEDELTA	Packets with priority 2 from interface since the last baseline reset.
Discarded Packet/sec from IF EP equals 0	(discPktFromIfByPrio[0]/NUM) DELTA SECONDS DIVIDE	Discarded packets with priority 0 from interface per second.
Discarded Packet from IF EP equals 0 since Baseline	(discPktFromIfByPrio[0]/NUM) BASELINEDELTA	Discarded packets with priority 0 from interface since the last baseline reset.
Discarded Packet/sec from IF EP equals 1	(discPktFromIfByPrio[1]/NUM) DELTA SECONDS DIVIDE	Discarded packets with priority 1 from interface per second.
Discarded Packet from IF EP equals 1 since Baseline	(discPktFromIfByPrio[1]/NUM) BASELINEDELTA	Discarded packets with priority 1 from interface since the last baseline reset.
Discarded Packet/sec from IF EP equals 2	(discPktFromIfByPrio[2]/NUM) DELTA SECONDS DIVIDE	Discarded packets with priority 2 from interface per second.

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Table 76 (continued)
Component: EM/ TRK/

Name	Formula	Meaning
Discarded Packet from IF EP equals 2 since Baseline	(discPktFromIfByPrio[2]/NUM) BASELINEDELTA	Discarded packets with priority 2 from interface since the last baseline reset.
Octets/sec from Interface EP equals 0	(octetFromIfByPrio[0]/NUM) DELTA SECONDS DIVIDE	Octets with priority 0 from interface per second.
Octets from Interface EP equals 0 since Baseline	(octetFromIfByPrio[0]/NUM) BASELINEDELTA	Octets with priority 0 from interface since the last baseline reset.
Octets/sec from Interface EP equals 1	(octetFromIfByPrio[1]/NUM) DELTA SECONDS DIVIDE	Octets with priority 1 from interface per second.
Octets from Interface EP equals 1 since Baseline	(octetFromIfByPrio[1]/NUM) BASELINEDELTA	Octets with priority 1 from interface since the last baseline reset.
Octets/sec from Interface EP equals 2	(octetFromIfByPrio[2]/NUM) DELTA SECONDS DIVIDE	Octets with priority 2 from interface per second.
Octets from Interface EP equals 2 since Baseline	(octetFromIfByPrio[2]/NUM) BASELINEDELTA	Octets with priority 2 from interface since the last baseline reset.
Utilization	(utilization/NUM)	Average trunk utilization.

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Table 77
Component: EM/ TRK/ UNACKED FRAMER

Name	Formula	Meaning
Frames per second from Interface	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames from Interface since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.

(Sheet 1 of 2)

Table 77 (continued)
Component: EM/ TRK/ UNACKED FRAMER

Name	Formula	Meaning
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Outgoing Priority Link Utilization	(highPrioLinkUtilToIf/NUM)	Priority traffic sending link utilization.
Incoming Priority Link Utilization	(highPrioLinkUtilFromIf/NUM)	Priority traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA	Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA	Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA	Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM) DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA	Number of aborted frames since the last baseline reset.

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Table 78
Component: EM/ TRK/ UTP FRAMER

Name	Formula	Meaning
Frames per second to Interface	(frmToIf/NUM) DELTA SECONDS DIVIDE	Frames sent per second.
Frames to Interface since Baseline	(frmToIf/NUM) BASELINEDELTA	Frames sent since the last baseline reset.

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Table 78 (continued)
Component: EM/ TRK/ UTP FRAMER

Name	Formula	Meaning
Frames per second from Interface	(frmFromIf/NUM) DELTA SECONDS DIVIDE	Frames received per second.
Frames from Interface since Baseline	(frmFromIf/NUM) BASELINEDELTA	Frames received since the last baseline reset.
Outgoing Normal Link Utilization	(normPrioLinkUtilToIf/NUM)	Normal traffic sending link utilization.
Incoming Normal Link Utilization	(normPrioLinkUtilFromIf/NUM)	Normal traffic receiving link utilization.
Outgoing Priority Link Utilization	(highPrioLinkUtilToIf/NUM)	Priority traffic sending link utilization.
Incoming Priority Link Utilization	(highPrioLinkUtilFromIf/NUM)	Priority traffic receiving link utilization.
Octet Alignment Errors	(nonOctetErrors/NUM) DELTA	Number of non-octet aligned frames since last probe.
Octet Alignment Errors since Baseline	(nonOctetErrors/NUM) BASELINEDELTA	Number of non-octet aligned frames since the last baseline reset.
Frame Length Errors	(largeFrmErrors/NUM) DELTA	Number of bad length frames since last probe.
Frame Length Errors since Baseline	(largeFrmErrors/NUM) BASELINEDELTA	Number of bad length frames since the last baseline reset.
Frame Abort Errors	(aborts/NUM) DELTA	Number of aborted frames since last probe.
Frame Abort Errors since Baseline	(aborts/NUM) BASELINEDELTA	Number of aborted frames since the last baseline reset.

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Table 79
Component: EM/ VR/ IFTABLEENTRY/

Name	Formula		Meaning
comp Name	(componentName/STR)		Provides a component name associated with the IFentry.
In Octets	(ifInOctets/NUM)	DELTA	Number of octets received on the interface, including framing characters.
In Octets since Baseline	(ifInOctets/NUM) BASELINEDELTA		Number of octets received on the interface, including framing characters, since the last baseline reset.
Out Octets	(ifOutOctets/NUM) DELTA		Number of octets transmitted out the interface, including framing characters.
Out Octets since Baseline	(ifOutOctets/NUM) BASELINEDELTA		Number of octets transmitted out the interface, including framing characters, since the last baseline reset.
In Discards	(ifInDiscards/NUM) DELTA		Number of inbound packets discarded even though no errors detected. Prevents the packets from being delivered to a higher layer protocol.
In Discards since Baseline	(ifInDiscards/NUM) BASELINEDELTA		Number of inbound packets discarded even though no errors detected since the last baseline reset. Prevents the packets from being delivered to a higher layer protocol.
Out Discards	(ifOutDiscards/NUM) DELTA		Number of outbound packets discarded even though no errors detected. Prevents the packets from being transmitted.

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Table 79 (continued)
Component: EM/ VR/ IFTABLEENTRY/

Name	Formula	Meaning
Out Discards since Baseline	(ifOutDiscards/NUM) BASELINEDELTA	Number of outbound packets discarded even though no errors detected since the last baseline reset. Prevents the packets from being transmitted.
In Ucast Pkts	(ifInUcastPkts/NUM) DELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol.
In Ucast Pkts since Baseline	(ifInUcastPkts/NUM) BASELINEDELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol since the last baseline reset.
Out Ucast Pkts	(ifOutUcastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address. Includes discarded and unsent packets.
Out Ucast Pkts since Baseline	(ifOutUcastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address, since the last baseline reset. Includes discarded and unsent packets.
In NUcast Pkts	(ifInNuCastPkts/NUM) DELTA	Number of non-unicast packets delivered to a higher layer protocol.
In NUcast Pkts since Baseline	(ifInNuCastPkts/NUM) BASELINEDELTA	Number of non-unicast packets delivered to a higher layer protocol, since the last baseline reset.

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Table 79 (continued)
Component: EM/ VR/ IFTABLEENTRY/

Name	Formula	Meaning
Out NUcast Pkts	(ifOutNuCastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a non-unicast address. Includes discarded and unsent packets.
Out NUcast Pkts since Baseline	(ifOutNuCastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a non-unicast address, since the last baseline reset. Includes discarded and unsent packets.
In Octets (64-bit)	(ifHCInOctets/NUM) DELTA	Number of octets received on the interface, including framing characters, in 64-bit.
In Octets since Baseline (64-bit)	(ifHCInOctets/NUM) BASELINEDELTA	Number of octets received on the interface, including framing characters, since the last baseline reset, in 64-bit.
Out Octets (64-bit)	(ifHCOutOctets/NUM) DELTA	Number of octets transmitted out the interface, including framing characters, in 64-bit.
Out Octets since Baseline (64-bit)	(ifHCOutOctets/NUM) BASELINEDELTA	Number of octets transmitted out the interface, including framing characters, since the last baseline reset, in 64-bit.
In Ucast Pkts (64-bit)	(ifHCInUcastPkts/NUM) DELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol, in 64-bit.
In Ucast Pkts since Baseline (64-bit)	(ifHCInUcastPkts/NUM) BASELINEDELTA	Number of subnetwork-unicast packets delivered to a higher layer protocol since the last baseline reset, in 64-bit.

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Table 79 (continued)
Component: EM/ VR/ IFTABLEENTRY/

Name	Formula	Meaning
Out Ucast Pkts (64-bit)	(ifHCOutUcastPkts/NUM) DELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address. Includes discarded and unsent packets, in 64-bit.
Out Ucast Pkts since Baseline (64-bit)	(ifHCOutUcastPkts/NUM) BASELINEDELTA	Number of packets the higher level protocols request to be transmitted to a subnetwork-unicast address, since the last baseline reset. Includes discarded and unsent packets, in 64-bit.

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Table 80
Component: EM/ VR/ IP

Name	Formula	Meaning
Input Datagrams Received	(inReceives/NUM) DELTA	The number of input datagrams received from the interfaces, including those received in error since the last probe.
Input Datagrams Received since Baseline	(inReceives/NUM) BASELINEDELTA	The number of input datagrams received from the interfaces, including those received in error since the last baseline reset.
Invalid Address Errors Discarded	(inAddrErrors/NUM) DELTA	The number of input datagrams discarded due to errors such as invalid address, unsupported address class since the last probe.

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Table 80 (continued)
Component: EM/ VR/ IP

Name	Formula	Meaning
Invalid Address Errors Discarded since Baseline	(inAddrErrors/NUM) BASELINEDELTA	The number of input datagrams discarded due to errors such as invalid address, unsupported address class since the last baseline reset.
Invalid Header Errors Discarded	(inHdrErrors/NUM) DELTA	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc since the last probe.
Invalid Header Errors Discarded since Baseline	(inHdrErrors/NUM) BASELINEDELTA	The number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc since the last baseline reset.
Input Datagrams Discarded	(inDiscards/NUM) DELTA	The number of input datagrams for which no problems were encountered to prevent their continued processing, but which were discarded due to the lack of buffers since the last probe. This does not include any datagram discarded while awaiting for re-asembly.

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Table 80 (continued)
Component: EM/ VR/ IP

Name	Formula		Meaning
Input Datagrams Discarded since Baseline	(inDiscards/NUM) BASELINEDELTA		The number of input datagrams for which no problems were encountered to prevent their continued processing, but which were discarded due to the lack of buffers since the last baseline reset. This does not include any datagram discarded while awaiting for re-asembly.
Input Datagrams Delivered	(inDelivers/NUM)	DELTA	The number of input datagrams successfully delivered to IP user- protocols (including ICMP) since the last probe.
Input Datagrams Delivered since Baseline	(inDelivers/NUM) BASELINEDELTA		The number of input datagrams successfully delivered to IP user- protocols (including ICMP) since the last baseline reset.
Out Requests	(outRequests/NUM) DELTA		The number of datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission since the last probe.
Out Requests since Baseline	(outRequests/NUM) BASELINEDELTA		The number of datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission since the last baseline reset.
Out Discards	(outDiscards/NUM) DELTA		The number of outbound datagrams that were discarded due to the lack of buffers since the last probe.

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Table 80 (continued)
Component: EM/ VR/ IP

Name	Formula	Meaning
Out Discards since Baseline	(outDiscards/NUM) BASELINEDELTA	The number of outbound datagrams that were discarded due to the lack of buffers since the last baseline reset.
No Route Out Discards	(outNoRoutes/NUM) DELTA	The number of outbound datagrams discarded because no route could be found to transmit them to their destination since the last probe.
No Route Out Discards since Baseline	(outNoRoutes/NUM) BASELINEDELTA	The number of outbound datagrams discarded because no route could be found to transmit them to their destination since the last baseline reset.
Routing Discards	(routingDiscards/NUM) DELTA	The number of routing entries which were chosen to be discarded even though they are valid since the last probe.
Routing Discards since Baseline	(routingDiscards/NUM) BASELINEDELTA	The number of routing entries which were chosen to be discarded even though they are valid since the last baseline reset.

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Table 81
Component: EM/ VR/ IP RTD VCGDESTADDR/

Name	Formula	Meaning
Minimum Round Trip Delay	(minRoundTripDelay/NUM)	Minimum round trip delay measured in the last monitoring session.
Maximum Round Trip Delay	(maxRoundTripDelay/NUM)	Maximum round trip delay measured in the last monitoring session.
Average Round Trip Delay	(avgRoundTripDelay/NUM)	Average round trip delay calculated in the last monitoring session.
RTD Frame Transmitted	(framesTransmitted/NUM)	The number of RTD frames transmitted to this remote destination address.
RTD Frame Received	(framesReceived/NUM)	The number of RTD frames received.
Last Monitoring Time	(time/STR)	The start time of the latest RTD session.

Table 82
Component: EM/ VR/ PP/ MPLSPORT

Name	Formula		Meaning
In Octets Received	(inOctets/NUM)	DELTA	The number of octets received from terminating or incoming tandem MPLS data traffic since the last probe.
In Octets Received since Baseline	(inOctets/NUM) BASELINEDELTA		The number of octets received from terminating or incoming tandem MPLS data traffic since the last baseline reset.
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Table 82 (continued)
Component: EM/ VR/ PP/ MPLSPORT

Name	Formula		Meaning
In Octets Discarded	(inDiscards/NUM) DELTA		The number of octets received but discarded from terminating or incoming tandem MPLS data traffic since the last probe.
In Octets Discarded since Baseline	(inDiscards/NUM) BASELINEDELTA		The number of octets received but discarded from terminating or incoming tandem MPLS data traffic since the last baseline reset.
Out Octets Received	(outOctets/NUM)	DELTA	The number of octets transmitted for originating or outgoing transit MPLS data since the last probe.
Out Octets Received since Baseline	(outOctets/NUM) BASELINEDELTA		The number of octets transmitted for originating or outgoing transit MPLS data since the last baseline reset.
Out Octets Discarded	(outDiscards/NUM) DELTA		The total number of packets transmitted that were discarded since the last probe.
Out Octets Discarded since Baseline	(outDiscards/NUM) BASELINEDELTA		The total number of packets transmitted that were discarded since the last baseline reset.

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Table 83
Component: EM/ VR/ PP/ MPLSPORT INSEG/

Name	Formula		Meaning
De0 Octets Received	(de0Oct/NUM)	DELTA	The number of the received and successfully passed through octets for the ingress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.
De0 Octets Received since Baseline	(de0Oct/NUM) BASELINEDELTA		The number of the received and successfully passed through octets for the ingress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.
De1 Octets Received	(de1Oct/NUM)	DELTA	The number of the received and successfully passed through octets for the ingress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.
De1 Octets Received since Baseline	(de1Oct/NUM) BASELINEDELTA		The number of the received and successfully passed through octets for the ingress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.
De0 Octets Discarded	(de0OctDsc/NUM) DELTA		The number of the received but discarded octets for the ingress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.

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Table 83 (continued)
Component: EM/ VR/ PP/ MPLSPORT INSEG/

Name	Formula	Meaning
De0 Octets Discarded since Baseline	(de0OctDsc/NUM) BASELINEDELTA	The number of the received but discarded octets for the ingress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.
De1 Octets Discarded	(de1OctDsc/NUM) DELTA	The number of the received but discarded octets for the ingress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.
De1 Octets Discarded since Baseline	(de1OctDsc/NUM) BASELINEDELTA	The number of the received but discarded octets for the ingress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.

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Table 84
Component: EM/ VR/ PP/ MPLSPORT OUTSEG/

Name	Formula		Meaning
De0 Octets Received	(de0Oct/NUM)	DELTA	The number of the received and successfully passed through octets for the egress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.
De0 Octets Received since Baseline	(de0Oct/NUM) BASELINEDELTA		The number of the received and successfully passed through octets for the egress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.
De1 Octets Received	(de1Oct/NUM)	DELTA	The number of the received and successfully passed through octets for the egress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.
De1 Octets Received since Baseline	(de1Oct/NUM) BASELINEDELTA		The number of the received and successfully passed through octets for the egress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.
De0 Octets Discarded	(de0OctDsc/NUM) DELTA		The number of the received but discarded octets for the egress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.

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Table 84 (continued)
Component: EM/ VR/ PP/ MPLSPORT OUTSEG/

Name	Formula	Meaning
De0 Octets Discarded since Baseline	(de0OctDsc/NUM) BASELINEDELTA	The number of the received but discarded octets for the egress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.
De1 Octets Discarded	(de1OctDsc/NUM) DELTA	The number of the received but discarded octets for the egress traffic on this segment since the last probe. The octets reflect the non discard-eligible traffic.
De1 Octets Discarded since Baseline	(de1OctDsc/NUM) BASELINEDELTA	The number of the received but discarded octets for the egress traffic on this segment since the last baseline reset. The octets reflect the non discard-eligible traffic.

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Table 85
Component: EM/ VROUTE/

Name	Formula	Meaning
Calls From Subnet	(totalCallsFromSubnet/NUM) DELTA	Number of call attempts from the subnet since the last probe.
Calls From Subnet since Baseline	(totalCallsFromSubnet/NUM) BASELINEDELTA	Number of call attempts from the subnet since the last baseline reset.
Calls Cleared (No Channel)	(callsClearedNoChannel/NUM) DELTA	Number of call attempts from the subnet since the last probe rejected due to lack of idle channels.

(Sheet 1 of 2)

Table 85 (continued)
Component: EM/ VROUTE/

Name	Formula	Meaning
Calls Cleared (No Channel) since Baseline	(callsClearedNoChannel/NUM) BASELINEDELTA	Number of call attempts from the subnet rejected due to lack of idle channels, since the last baseline reset.
Calls Cleared (Out of Service)	(callsClearedOutOfService/NUM) DELTA	Number of call attempts from the subnet since the last probe rejected due to lack of in-service channels.
Calls Cleared (Out of Service) since Baseline	(callsClearedOutOfService/NUM) BASELINEDELTA	Number of call attempts from the subnet rejected due to lack of in-service channels, since the last baseline reset.
Calls Rejected	(callsRejected/NUM) DELTA	Number of call attempts from the subnet since the last probe rejected due to typeOfCall or signaling protocol mismatches.
Calls Rejected since Baseline	(callsRejected/NUM) BASELINEDELTA	Number of call attempts from the subnet rejected due to typeOfCall or signaling protocol mismatches, since the last baseline reset.

(Sheet 2 of 2)

Table 86
Component: EM/ VS/ FRAMER

Name	Formula	Meaning
Total Cells	(totalCells/NUM) DELTA	Total number of cells since last probe.
Total Cells since Baseline	(totalCells/NUM) BASELINEDELTA	Total number of cells since the last baseline reset.
Audio Cells	(audioCells/NUM) DELTA	Number of audio cells since last probe.

(Sheet 1 of 3)

Table 86 (continued)
Component: EM/ VS/ FRAMER

Name	Formula	Meaning
Audio Cells since Baseline	(audioCells/NUM) BASELINEDELTA	Number of audio cells since the last baseline reset.
Frames To Network (64 s)	(frmToNetwork[0]/NUM) DELTA	Number of frames to network since last probe.
Frames To Network (64 s) since Baseline	(frmToNetwork[0]/NUM) BASELINEDELTA	Number of frames to network since the last baseline reset.
Frames To Network (32 s)	(frmToNetwork[1]/NUM) DELTA	Number of frames to network since last probe.
Frames To Network (32 s) since Baseline	(frmToNetwork[1]/NUM) BASELINEDELTA	Number of frames to network since the last baseline reset.
Frames To Network (24 s)	(frmToNetwork[2]/NUM) DELTA	Number of frames to network since last probe.
Frames To Network (24 s) since Baseline	(frmToNetwork[2]/NUM) BASELINEDELTA	Number of frames to network since the last baseline reset.
Frames To Network (16 s)	(frmToNetwork[3]/NUM) DELTA	Number of frames to network since last probe.
Frames To Network (16 s) since Baseline	(frmToNetwork[3]/NUM) BASELINEDELTA	Number of frames to network since the last baseline reset.
Frames To Network (8 s)	(frmToNetwork[4]/NUM) DELTA	Number of frames to network since last probe.
Frames To Network (8 s) since Baseline	(frmToNetwork[4]/NUM) BASELINEDELTA	Number of frames to network since the last baseline reset.
Frames Lost In Network	(frmLostInNetwork/NUM) DELTA	Number of frames lost in network since last probe.
Frames Lost In Network since Baseline	(frmLostInNetwork/NUM) BASELINEDELTA	Number of frames lost in network since the last baseline reset.
Frames Underruns	(frmUnderRuns/NUM) DELTA	Number of frame underruns since last probe.
Frames Underruns since Baseline	(frmUnderRuns/NUM) BASELINEDELTA	Number of frame underruns since the last baseline reset.

(Sheet 2 of 3)

Table 86 (continued)
Component: EM/ VS/ FRAMER

Name	Formula	Meaning
Frames Dumped	(frmDumped/NUM) DELTA	Number of frame dumps since last probe.
Frames Dumped since Baseline	(frmDumped/NUM) BASELINEDELTA	Number of frame dumps since the last baseline reset.
LRC Errors	(lrcErrors/NUM) DELTA	Number of LRC errors since last probe.
LRC Errors since Baseline	(lrcErrors/NUM) BASELINEDELTA	Number of LRC errors since the last baseline reset.
Modem Cells	(modemCells/NUM) DELTA	Number of modem cells since last probe.
Modem Cells since Baseline	(modemCells/NUM) BASELINEDELTA	Number of modem cells since the last baseline reset.

(Sheet 3 of 3)

Table 87
Component: EM/ VS/ LCO

Name	Formula	Meaning
Voice Tx Rate (kb/s)	(pktsToNetwork/NUM) DELTA 352 MULTIPLY SECONDS DIVIDE 1000 DIVIDE	Kilobits sent per second (44 Bytes/packet).
Voice Tx (kb) since Baseline	(pktsToNetwork/NUM) BASELINEDELTA 352 MULTIPLY 1000 DIVIDE	Kilobits sent (44 Bytes/ packet) since the last baseline reset.
Voice Rx Rate (kb/s)	(pktsFromNetwork/NUM) DELTA 352 MULTIPLY SECONDS DIVIDE 1000 DIVIDE	Kilobits received per second (44 Bytes/packet).

(Sheet 1 of 2)

Table 87 (continued)
Component: EM/ VS/ LCO

Name	Formula	Meaning
Voice Rx (kb) since Baseline	(pktsFromNetwork/NUM) BASELINEDELTA 352 MULTIPLY 1000 DIVIDE	Kilobits received (44 Bytes/ packet) since the last baseline reset.
Round trip delay (ms)	(measuredRoundTripDelay/NUM)	Measured round trip delay in milliseconds.
Path Up DateTime	(pathUpDateTime/STR)	Path up date and time.
(Sheet 2 of 2)		

Table 88
Component: EM/ VSR/

Name	Formula	Meaning
Active Channel Number	(activeChannels/NUM)	Number of currently active B-channels.
Active Voice Channel Number	(activeVoiceChannels/NUM)	Number of currently active B-channels carrying voice.
Active Modem Channel Number	(activeModemChannels/NUM)	Number of currently active B-channels carrying MODEM (2100Hz tone).
Active Data Channel Number	(activeDataChannels/NUM)	Number of currently active B-channels carrying data.

Appendix B
DPN-100 metrics

DPN-100 Metrics

DPN-100 metrics are generated by the DPN Performance Viewer, and are detailed in the following sections.

Micro status

This DPN Performance Viewer option provides metrics for the PEs of a specific DPN-100 module. The information for these metrics is gathered from the DPN-100 NCS PE status records.

See the table "Destination mnem: PM/<mnemonic> or just <mnemonic>" (page 266).

Table 89
Destination mnem: PM/<mnemonic> or just <mnemonic>

Name	Formula	Label	Meaning
CPU Utilization (%)	peCpuUtilization	UT	PE CPU utilitilization Range: 0-100 %, -1 = down
Free Heap (%)	peFreeHeap	HP	PE free heap space utilization Range: 0-100 %, -1 = down
Free MSG (%)	peFreeMsgPE	MSG	free message blocks utilization Range: 0-100 %, -1 = down
PPS Sent	pePpsSent	TXPK/S	Packets per second sent Initial Range: 0-20 pps, -1 = down
PPS Received	pePpsReceived	RXPK/S	Packets per second received Initial Range: 0-20 pps, -1 = down
PE Service	peService	SERVICE	PE service name

Net Link status

This PV option provides metrics for all the network links whose endpoint modules report to a specific DPN-100 NCS OA. The information for these metrics is gathered from the DPN-100 NCS Network Link status records.

See the table “Destination mnem: OA/<mnemonic> or just <mnemonic>” (page 267).

Table 90
Destination mnem: OA/<mnemonic> or just <mnemonic>

Name	Formula	Label	Meaning
Netlink Transmit Utilization (%)	netlinkUtilization	UT	Network link transmit side utilization Range: 0-100 %, -1 = down
Netlink Local Mnemonic	netlinkLocalMnemonic	LOCAL	Local network link mnemonic
Netlink Remote Mnemonic	netlinkRemoteMnemonic	REMOTE	Remote network link endpoint component ID

Trunk status

This DPN Performance Viewer option provides metrics for all the Trunks whose endpoint modules report to a specific DPN-100 NCS OA. The information for these metrics is gathered from the DPN-100 NCS Trunk status records.

See the table “Destination mnem: OA/<mnemonic> or just <mnemonic>” (page 267).

Table 91
Destination mnem: OA/<mnemonic> or just <mnemonic>

Name	Formula	Label	Meaning
Trunk Transmit Utilization (%)	trunkUtilization	UT	Trunk transmit side link utilization Range: 0-100 %, -1 = down
Trunk Local Mnemonic	trunkLocalMnemonic	LOCAL	Local trunk mnemonic
Trunk Remote Mnemonic	trunkRemoteMnemonic	REMOTE	Remote trunk endpoint component ID

Gateway status

This DPN Performance Viewer option provides metrics for all the X.25 and X.75 gateways whose endpoint module reports to a specific DPN-100 NCS OA. The information for these metrics is gathered from the DPN-100 NCS X.25 and X.75 Gateway status records.

See the table “Destination mnem: OA/<mnemonic> or just <mnemonic>” (page 268).

Table 92
Destination mnem: OA/<mnemonic> or just <mnemonic>

Name	Formula	Label	Meaning
Gateway Type	gatewayType	TYPE	Type of gateway (X25 or X75)
Gateway Call (%)	gatewayCall	CALL	Maximum percentage number of active LCNs compared to the total number of LCNs for the status interval Range: 0-100 %, -1 = down
Link Transmit Utilization (%)	gatewayLinkUtilization	LINK UT	Total link sending and receiving utilization Range: 0-100 %, -1 = down
Gateway Pkt Sent	gatewayPktSent	TXPK/S	Packets per second sent Initial Range: 0-20 pps, -1 = down
Gateway Pkt Received	gatewayPktReceived	RXPK/S	Packets per second received Initial Range: 0-20 pps, -1 = down

Summary status

This DPN Performance Viewer option provides NCS Common Memory metrics for modules reporting to a specific DPN-100 NCS OA. The information for these metrics is gathered from the DPN-100 NCS Common Memory status records.

See the table “Destination mnem: OA/<mnemonic> or just <mnemonic>” (page 269).

Table 93
Destination mnem: OA/<mnemonic> or just <mnemonic>

Name	Formula	Label	Meaning
Bus Utilization (%)	pmBusUtilization	BUS	Module bus utilization Range: 0-100
Common MSG (%)	pmCommonMsg	MSG	Common memory message block utilization Range: 0-100

Appendix C
Metric file format

This appendix describes the metric elements and their associated attributes in SNMP metric files, describes their formats, and provides sample metric files. The section contains the following topics:

You can add metrics and components to extend the SNMP metric file as required.

The metric file is a flat ASCII file in XML format. To edit it, use a standard Unix text editor.

SNMP metric file formats

The metric file contains elements and attributes. For a description of the format of this file, see "METRICFILE" (page 271). To view sample metric file formats, see "Metric file example" (page 282)

METRICFILE

The keyword <METRICFILE> is mandatory. This keyword denotes the beginning of a metric file and must be the first entry in the metric file. The keyword </METRICFILE> is also mandatory. This keyword denotes the end of a metric file and must be the last entry in the metric file.

Comment

The comment element is optional. You can place comments anywhere within the metric file. The format for this element is <!--Comments-->.

COMPONENT

The COMPONENT element is mandatory. This element describes the characteristics of the component. You can embed one or more COMPONENT elements within the METRICFILE tags. The notation <COMPONENT...> indicates the beginning of the COMPONENT definition and the notation </COMPONENT> indicates the end of that definition. You need to define all attributes of the COMPONENT element within these notations. The attributes of the COMPONENT element are as follows:

COMPONENT NAME

The format for the NAME attribute of the COMPONENT element is <COMPONENT NAME = "<component name>"> where <component name> is the component name used in the Preside MDM component hierarchy. The name begins with the device type which is the root of the hierarchy. A slash (/) at the end of each component type indicates that a component attribute is required. Use only uppercase characters in this field.

> ***Note:*** The short form of the component prompt must be used for <component name>. Do not leave any white space before or after <component name>. Failure to do this when adding or editing metrics results in a component not available message when polling for one or more metrics.

SEPARATE_IP

The SEPARATE_IP element is optional. When used, it is an element within the COMPONENT element. This element indicates that the component has a different IP address than the device with which it is associated. To define this element, use the <SEPARATE_IP/> notation.

MAP

The MAP element is optional. When used, it is an element within the COMPONENT element. Use this element to map a component instance in the component name to a different value. You can define one or more MAP elements within the COMPONENT element. The notation <MAP...>

indicates the beginning of the MAP element definition and the notation </MAP> indicates the end of that definition. The are two attributes of the MAP element are as follows:

- **NAME**
  The MAP NAME attribute is mandatory when you use the MAP element. This attribute is an attribute of the MAP element and defines the component instance in the component name. The format of the MAP NAME attribute is <MAP NAME="<name>" where <name> uses the convention $n to indicate the nth component instance in the component name.

- **VALUE**
  The MAP VALUE indicates the decrement value of the component instance. The format of this attribute is VALUE="<value>" where <value> is "DEC(<offset>)" and <offset> is any integer or single alphabetic character (A to Z). The notation "DEC(<offset>)" decrements the component instance specified in the NAME attribute by the value specified in <offset>. The following example shows a sample MAP element:

  ```
  <MAP NAME="$4"
       VALUE="DEC(A)">
  </MAP>
  ```

  The value of "$4" for the MAP NAME attribute indicates the mapping of the value is performed on the fourth component instance in the component name. The value "DEC(A) indicates the fourth component instance value will be decremented by the value of the character A. If the fourth component instance is "A", then the resulting value is "0". If the fourth component instance is "B", then the resulting value is "1". The resulting VALUE is then used as the INDEX value in the METRIC element if this component instance is defined in the metric INDEX attribute.

METRIC

This METRIC element is mandatory. This element is an element within the COMPONENT element. You can define one or more METRIC elements within the COMPONENT element. The notation <METRIC...> indicates the beginning of the METRIC element definition and the notation </METRIC>

indicates the end of that definition. You need to define all attributes of the METRIC element within these notations. The attributes of the METRIC element are as follows:

- **NAME**
  The format for the NAME attribute of the METRIC element is <METRIC NAME="<metric name>...>" where <metric name> is the name of the metric. The Data Viewer main window uses this name to identify the metric.

- **POLLBYDEFAULT**
  The POLLBYDEFAULT attribute of the METRIC element specifies the default polling of the metric. The value of this keyword can be "yes" or "no". If "yes", the metric is polled by default and the metric name appears in the "Metrics to be Polled" list in the Data Viewer main window. If "no", the metric is not polled by default and appears in the "Metrics Available" list in the Data Viewer main window. To define this attribute, use the notation POLLBYDEFAULT="<yes or no>".

- **THRESHOLD**
  The THRESHOLD attribute is optional. This attribute of the METRIC element specifies the maximum threshold value of the metric. If a metric value exceeds the defined threshold, the Data Viewer windows displays that data in red. To define this attribute, use the notation THRESHOLD="<value>" where <value> is the threshold value.

- **STACK**
  The STACK attribute of the METRIC element identifies the attributes to be polled and the required calculation. To define this attribute, use the notation STACK="<stack elements>" where <stack elements> contain one of the following items:

  — an attribute which is defined as name/type

  — a constant, which you type as a string of digits

  — an operator keyword, which indicates that a numerical operation should be performed on the current stack contents (for example, ADD, SUBTRACT, MULTIPLY).

  — a special keyword (SECONDS) used to represent the elapsed time since the last update

The following are examples of metric stacks:

```
STACK="(sdmErroredSeconds/NUM)
(sdmSeverelyErroredSeconds/NUM
PERCENT"

STACK="(sdmErroredSeconds/NUM)
DELTA
8
MULTIPLY
SECONDS
DIVIDE
2
DIVIDE
2
SUBTRACT"
```

The stack depth is limited to two. Therefore you must express new Data Viewer metrics in a manner that will run with a stack depth of two.

Attributes
Each attribute specification is replaced on the stack by the corresponding value received from the network. Attributes are written as (name/type), where

name is the table column name taken from the MIB table for SNMP devices

type indicates the type of data returned from the device for this attribute. The Data Viewer supports only the numeric data type (NUM).

You can include the same attribute in more than one metric. In this case, only one copy of the attribute is stored in the Data Viewer; however, all metrics are calculated using the same attribute value.

Constants
You can place integer constants on the stack as required to compute the desired value. Constants are useful for

- dividing a value by 100 for display as a percentage

- converting between different units (for example, bytes per second to bits per second).

Operators

Several operators are available for use in a metric definition. In the following descriptions the top of the stack is the value (attribute or constant) most recently placed onto the stack. The bottom of the stack is the other value (since Data Viewer requires a stack depth of two).

The following binary operators are supported. When you use an operator, both the top and bottom values on the stack are removed and the resulting value is placed on the top of the stack.

- ADD
  Use this operator to add the two values on the stack and store the result.
- SUBTRACT
  Use this operator to subtract the top value from the bottom value and store the result. For example, “7 4 SUBTRACT” leaves a result of “3” on the stack.
- MULTIPLY
  Use this operator to multiply the stack values and store the result.
- DIVIDE
  Use this operator to divide the value on the bottom of the stack by the value on top and store the result. For example, “6 2 DIVIDE” leaves a result of “3” on the stack.
- PERCENT
  Use this operator as a shortcut to ensure that percentage calculations are performed correctly. In this example, “A B DIVIDE 100 MULTIPLY” normally produces the wrong answer because the (integer) division is performed before the multiplication. To ensure correct results, use the format “A B PERCENT”.

The following unary operators affect only the top element on the stack. You can apply them to both attributes and constants. However, they are only useful when the top element on the stack is an attribute or the result of a previous stack operation.

- NEGATE
  This operator toggles the sign of the value on top of the stack. For example, “6 2 NEGATE” leaves “6 -2” on the stack.
- DELTA
  This operator replaces the attribute value with the difference between the current value and the previous value for the same attribute. This is useful when dealing with attributes, such as alarm counts, that continue to grow over time.
- BASELINEDELTA
  This operator replaces the attribute value with the difference between the current value and the baseline value. The baseline value is the first sample taken after polling is started or resumed.

SECONDS Keyword

You can place the SECOND keyword on the stack to support time-based calculations. It is replaced on the stack by the elapsed time since the last update or calculation cycle, expressed in the appropriate units. For example, you might use the SECOND keyword to construct metrics of the form “Alarms per minute”. To do so, you would define the following (pseudo) stack:

(AlarmCount/123)
DELTA
SECONDS
DIVIDE
60
MULTIPLY

In this case the AlarmCount attribute is assumed to be a continually increasing variable. Therefore, you would use the DELTA operator to ensure that only the new alarms are used in this calculation.

- **INDEX**
  The INDEX describes the index of the attributes specified in the stack elements.

  The following conventions describe an index:

  — $n
  The index for the object identifier (OID) of the attribute in the stack uses the nth component instance in the component name. In the following example, the INDEX attribute has a value of $3. As a result, the third-level component in the component name is used as the index for the OID of the STACK attribute.

  ```
  <COMPONENT NAME = "<deivce type>/ <component>/">
      <METRIC NAME="Uncorrectable HEC errors"
          POLLBYDEFAULT="no"
          THRESHOLD="100"
          STACK="(<stack attribute>/NUM) DELTA"
          INDEX="$3" >
      </METRIC>
  </COMPONENT>
  ```

  where:
  device typeis the device type
  componentis the component type
  attribute stackis the attribute name of which its value is used to calculate the metric value

  When you enter the component <ABC>/NNE CA/1 SH/1 AWM/11 in the Data Viewer, and select the metric "Uncorrectable HEC errors", the attribute "awmUncorrHecErrors" translates into the OID .1.3.6.1.4.1.562.21.1.1.8.1.4.17.2.1.16. Because the INDEX attribute has a value of "$3", the third component instance (which is 11 for AWM) is used as the index to the MIB table column. The resulting OID is .1.3.6.1.4.1.562.21.1.1.8.1.4.17.2.1.16.11.

— (<table column>)
The index uses an entry in a MIB table column. The <table column> identifies the MIB table column that contains the index. This notation retrieves all values for the OID that are associated with the <table column>.

If there is only one value in the <table column>, then that value is used as the index. If there is more than one value in the <table column>, select the appropriate value for the index. This value is used as the index for all the selected component instances.

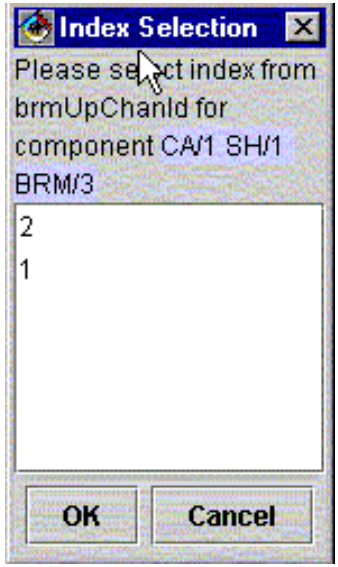
In the following example, the INDEX attribute is defined as the table column “brmUpChanId”.

```
<COMPONENT NAME = “<device type>/ <component>/”>
    <METRIC NAME=“<metric name>”
        POLLBYDEFAULT=“no”
        THRESHOLD=“100”
        STACK=“(<stack attribute>/NUM) DELTA”
        INDEX=“(<index attribute)” >
    </METRIC>
</COMPONENT>
```

where:
device typeis the device type
componentis the component type
metric nameis the name of the metric
stack attributeis the attribute name of which its value is used to calculate the metric value
index attributeis the attribute name of which its value is used to define the index value of the attribute name
<attribute name>

When you enter the component <device type>/ <component>/” in the Data Viewer and select the metric “Up Total Cell Count”, the INDEX attribute “brmUpChanId” is polled and values in this table column display in the Index Selection dialog.

— The value you select is used as the index to the attribute “bUpToTCellCount”. For example, if the OID for “bUpToTCellCount” is .1.3.6.1.4.1.562.21.1.1.8.1.4.19.1.18.1.2.and you select an index value of 2, then the OID becomes .1.3.6.1.4.1.562.21.1.1.8.1.4.19.1.18.1.2.2.



— (<table column>/COMPONENT)
The index uses an index of the <table column>. The keyword COMPONENT uses the component name in the Data Viewer window to find the index. When a value of the <table column> matches the component, the value’s associated index is used as the index for the OID of the attribute name.

In the following example, the INDEX attribute is defined as the value “mcmSysIfExtName/COMPONENT”.

<COMPONENT NAME = “MPA/ CARD/ PO/”>

```
<METRIC NAME="Frames received from WAN"
    POLLBYDEFAULT="no"
    THRESHOLD="100"
    STACK="(wanifGlobalStatisticsRxBlockCount/NUM)
        DELTA"
    INDEX="(mcmSysIfExtName/COMPONENT)" >
</METRIC>
</COMPONENT>
```

When you enter the component MPA/MPA1 CARD/1 PO/1 in Data Viewer and select the metric "wanifGlobalStatisticsRxBlockCount", the table column "mcmSysIfExtName" is polled. If a value in this table matches the string CARD/1 PO/1, then the index of the matched entry is used as the index for the STACK attribute "wanifGlobalStatisticsRxBlockCount". For example, if the OID for "wanifGlobalStatisticsRxBlockCount" is .1.3.6.1.4.1.562.21.1.1.8.1.4.19.1.18.1.2 and the index entry of the table column "mcmSysIfExtName" that matches the string CARD/1 PO/1 is 150, then the OID of the STACK attribute "wanifGlobalStatisticsRxBlockCount" becomes .1.3.6.1.4.1.562.21.1.1.8.1.4.19.1.18.1.2.150.

— <any string>
The constant string <any string> is used as the index for the OID of the attribute.

In the following example, the INDEX attribute has the value "0".

```
<COMPONENT NAME = "<device type>/ <component>/">
    <METRIC NAME="Snr"
        POLLBYDEFAULT="no"
        STACK="(<stack attribute>/NUM)"
        INDEX="(<index attribute>)" >
    </METRIC>
</COMPONENT>
```

where:
device type is the device type
componentis the component type

stack attributeis the attribute name of which its value is used to calculate the metric value

When you enter the component <ABC>/NIU3 TMM in Data Viewer and select the metric “Snr”, the STACK attribute “tmmDsSnr” is translated into its OID .1.3.6.1.4.1.562.21.1.2.14.12. With an INDEX value of “0”, the OID for “tmmDsSnr becomes .1.3.6.1.4.1.562.21.1.2.14.12.0.

If the OID of the attribute name specified in the stack requires more than one index, you can combine any index method, except for (<table column>/ COMPONENT).

Metric file example

```
<METRICFILE>
    <COMPONENT NAME = “<device type>/ <component>/”>
            <SEPARATE_IP/>
        <METRIC NAME=“<metric name>”
            POLLBYDEFAULT=“yes”
            THRESHOLD=“100”
            STACK=“(<stack attribute>/NUM) DELTA”
            INDEX=“(<index attribute>)”
        </METRIC>
        <METRIC NAME=“<metric name>”
            POLLBYDEFAULT=“no”
            THRESHOLD=“100”
            STACK=“(<stack attribute>/NUM) DELTA”
            INDEX=“(<index attribute>)”>
        </METRIC>


    <--! This is different COMPONENT -->
    <COMPONENT NAME = “<device type>/ <component?/”>
            <MAP NAME=”$4”
                VALUE=”DEC(A)”>
            </MAP>
        <METRIC NAME=“<metric name>”
            POLLBYDEFAULT=“no”
            THRESHOLD=“100”
```

```
            STACK="(<stack attribute>>/NUM) DELTA"
            INDEX="$3 $4">
        </METRIC>
        <METRIC NAME="<metric name>"
            POLLBYDEFAULT="no"
            THRESHOLD="100"
            STACK="(<stack attribute>/NUM) DELTA"
            INDEX="$3 $4">
        </METRIC>
    </COMPONENT>
</METRICFILE>
```

where:

device type	is the device type
component	is the component type
metric name	is the name of the metric
stack attribute	is the attribute name of which its value is used to calculate the metric value
index attribute	is the attribute name of which its value is used to define the index value of the attribute name <attribute name>

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Preside Multiservice Data Manager

Performance Management

User Guide

R14.3

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