NORTEL NETWORKS

Preside Multiservice Data Manager

Performance Management
User Guide

241-6001-031

Preside Multiservice Data Manager
Performance Management
User Guide

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Publication history

August 2004

15.5RSUP Standard
Commercial availability except for MPE support which will be available in a future release.

About this document

The following topics are discussed in this section:

- "Who should read this document and why" (page 13)

- "What you need to know" (page 13)

- "How this document is organized" (page 14)

- "What's new in this document" (page 15)

- "Text conventions" (page 15)

- "Related documents" (page 17)

Who should read this document and why

This document is for those who require performance metrics for devices in the Preside Multiservice Data Manager 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 and MPE 9500 products

- the UNIX operating system

How this document is organized

This document contains the following sections:

- "Performance management tools overview" (page 19) gives a description of the performance management tools and how to access them.

- "Data Viewer configuration" (page 21) 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.

- "Data Viewer real-time collection" (page 35) describes real-time collection procedures that operator's use to collect, display, and analyze performance information in real-time mode for component monitoring and diagnositics.

- "Data Viewer retrieval of collected metrics" (page 47) describes the procedures for replay mode, to analyze collected performance information for planning, pattern analysis, and fault cause analysis.

- "Data Viewer basic procedures" (page 53) describes basic procedures for operations such as starting and stopping, and for interface management through both the Preside Multiservice Data Manager Toolset and the Operator client in both real-time and replay modes.

- "Data Viewer window" (page 69) describes the main components in the Data Viewer windows for both real-time and replay modes.

- "Data Viewer fundamentals" (page 91) describes information specific to real-time mode, replay mode, or both.

- "DPN Performance Viewer" (page 107) describes the DPN Performance Viewer and provides instructions on how to use this tool.

Supplemental information in the appendices includes the following:

- Appendix A, " Passport performance metrics" (page 129), describes Passport performance metrics that the Data Viewer generates, by component in alphabetical order.

- Appendix B, "DPN-100 metrics" (page 301), describes metrics supported by the Data Viewer application.

- Appendix C, "Metric file format" (page 307), describes SNMP metric file format and elements.

What's new in this document

The following changes were made to this document:

- "MPE support" (page 15)

- "Operator client support" (page 15)

- "Restructure" (page 15)

MPE support

This document now includes new Data Viewer tool procedures and text to support MPE. The Data Viewer tool supports MPE in much the same way as it does Passport. However, the Data Viewer tool does not support collection of multiple component instances of MPE devices.

Operator client support

This document includes new Data Viewer tool procedures and text to support MPE real-time and replay modes on the Operator client.

Restructure

This document has been restructured using a task-based model.

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 document for related information:

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

Chapter 1
Performance management tools overview

There are two performance management tools available on the Preside Multiservice Data Manager.

- **Data Viewer**. Data Viewer monitors performance metrics of components associated with (Simple Network Management Protocol (SNMP), MPE_9500, and Passport devices using a graphical interface. Data Viewer also traces faults in the network, collects information about network load, and generates statistics for reporting analytical purposes. For an overview of the Data Viewer tool, see "Data Viewer" (page 19)for information.

- **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 107).

  Note: The DPN Viewer is only available from the Toolset and cannot be accessed from the Operator client.

Data Viewer

Data Viewer can be used in two modes:

- Real-time mode

- Replay mode

Use the Data Viewer tool to collect, display, and analyze performance information in real-time mode for component monitoring and diagnostics.

Use the Data Viewer in replay mode to analyze collected performance information for planning, pattern analysis, and fault cause analysis.

Prerequisites to using Data Viewer

• To use Data Viewer in real-time mode, the user must have permission to authenticate using a device.

• To use Data Viewer in replay mode, collect and save the following files:

— BDF

— Data Viewer Saved Statistics

— Streamed Passport Statistics

— Statistical Retrieval System

• To configure Data Viewer for real-time mode, the user must have administrator level privileges.

Data Viewer navigation

• "Data Viewer configuration" (page 21)

• "Data Viewer real-time collection" (page 35)

• "Data Viewer retrieval of collected metrics" (page 47)

• "Data Viewer basic procedures" (page 53)

• "Data Viewer window" (page 69)

• "Data Viewer fundamentals" (page 91)

Chapter 2
Data Viewer configuration

Customize the Data Viewer configuration when you want to make changes to the initial default configuration, or when you need to make changes to existing metrics or add new metrics.

Use Data Viewer configuration procedures to

- create or update metrics files

- integrate the metrics files needed for Data Viewer operation

User Preferences can be configured for Data Viewer. System level preferences are set by the administrator for a group of users, and user level preferences are set by individual users for themselves. Instructions for customizing user preferences are found in 241-6001-301 *Preside MDM Customization Administrator Guide*.

Prerequisites to Data Viewer configuration

- To configure Data Viewer you must have administrator level privileges.

- Be familiar with the differences between the Operator client and the Preside Multiservice Data Manager Toolset. For more information, see 241-6001-100 *Preside MDM Installation*.

Navigation

Data Viewer metrics configuration

Use the metrics configuration procedures to create or update metrics on SNMP devices, and Passport. Metrics configuration requires product integration for SNMP devices and Passport devices. SNMP devices require PMDCD configuration updates when there are changes to the metrics.

Note: The Nortel Networks Multiservice Provider Edge (MPE) metrics file cannot be changed in this release.

Instructions support the Toolset and Operator client environments unless other wise indicated.

Prerequisites

- Data Viewer must be installed (as part of the Preside Multiservice Data Manager installation).

- Fault Management must be configured.

- Configuration variables values must be defined in a separate planning activity.

Navigation

Metrics configuration procedures

Use the following taskflow to identify the procedures needed to perform
metrics configuration for SNMP devices, and Passport devices.

```
                          ┌─────────────────┐
                          │  Data Viewer    │
                          │    Metrics      │
                          │ Configuration   │
                          └─────────────────┘
                                   │
                                   ▼
                          ◇─────────────────◇
        ┌───────────┐     On which              ┌───────────┐
        │   SNMP    │◀────devices are you ─────▶│ Passport  │
        │  devices  │     configuring            └───────────┘
        └───────────┘     metrics?
                          ◇─────────────────◇
```

SNMP devices branch:

- Creating a new metric file or Updating an existing metric file
- Updating the Data Viewer agent map file
- Updating the PMDCD configuration file
- User preferences for Data Viewer in 241-6001-301

Passport branch:

- Creating a new metric file or Updating an existing metric file
- Updating the Data Viewer agent map file
- User preferences for Data Viewer in 241-6001-301

Both branches lead to: Metrics configured

Metrics configuration procedures navigation

SNMP device metrics configuration procedures navigation

*   "Creating a new metric file" (page 25) or "Updating an existing metric file" (page 32)

*   "Updating the Data Viewer agent map file" (page 31)

*   "Updating the PMDCD configuration file" (page 32)

*   "User preferences for Data Viewer" in the 241-6001-301 *Preside MDM Customization Administrator Guide*

Passport metrics configuration procedures navigation

*   "Creating a new metric file" (page 25) or "Updating an existing metric file" (page 32)

*   "Updating the Data Viewer agent map file" (page 31)

*   "User preferences for Data Viewer" in the 241-6001-301 *Preside MDM Customization Administrator Guide*

Creating a new metric file

Use this procedure to create a new metric file that allows you to collect and display data using Data Viewer.

Note: You cannot customize the MPE metric file.

Instructions support SNMP devices, and Passport unless other wise indicated.

For details about the required elements and format of the metric file, see "Metric file format" (page 307).

Navigation

Procedure steps

1   Log on as root.

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

For	Access directory
SNMP devices	cd /opt/MagellanNMS/cfg/pmr
Passport	cd /opt/MagellanNMS/cfg/pmr
	cd /opt/MagellanNMS/ext/lib/cfg/ pmr
MPE	MPE metrics file cannot be customized in this release

3   Using a UNIX editor, open a new file for editing.

4   The subsequent steps in this procedure specify the required entries that you need to add to create a metric file.

5   Define the beginning of the metric file:

    <METRICFILE>

For more information on how to structure a metrics file, see "Sample metrics file job aid" (page 29).

6 Define a component:

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

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

7 Use this table to add SNMP-specific commands. Otherwise, go to the next step.

For...	Instruction	Command
SNMP devices	If the component requires an IP address separate from the device itself, type the following entry.	<SEPARATE_IP/>
	If the component requires mapping a component instance in the component name to a different value, type the following entry.	<MAP NAME = "<name>" VALUE = "DEC(<offset>)">s
MPE	Define the community string.	<PROMPT NAME="community string">
	Define the MPE 9500 index mapping label on the Input Request dialog.	<PARAMETER="label name">

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.

For more information, see "Variable definitions" (page 28).

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

`POLLBYDEFAULT = "<yes|no>"`

For more information, see "Variable definitions" (page 28).

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

`THRESHOLD = "<value>"`

11   Define the METRIC STACK attribute:

`STACK = "<stack elements>"`

For more information, see "Variable definitions" (page 28).

12   If required for SNMP devices and MPE, specify the metric index.

`INDEX = "<index elements>"`

For more information, see "Variable definitions" (page 28).

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 6 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

`<![CDATA[Discarded packets with priority 0 from`
`interface since the last baseline reset.]]>`

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

For more information, see "Sample metrics file job aid" (page 29).

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
`<file name>`	is the name of the metric file used in step 3
`<index elements>`	specifies the index of the attributes in the stack
`<metric name>`	is the name of the metric
`<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
`<prompt name`	is the name of the prompt used to define both the community string and index mappings
`<SEPARATE_IP/>`	specifies that the IP address is separate from the device
`<stack elements>`	specifies the attributes to be polled and their calculations
`<value>`	is the threshold value

Sample Cdata notation for metrics in a metrics file job aid
The following is an example of a Cdata metric description for metric "Tx Cells From Baseline". Use it as a model when creating Cdata metric definitions.

```
<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.]]>
```

Sample metrics file job aid
The following is an example of a metrics file.

```
<METRICFILE>

<DEFINE>
<ENTRY NAME="CPUMemHeapTotal"
OID=".1.3.6.1.4.1.3199.10.28.1.2.14"/>
<ENTRY NAME="CPUMemHeapFree"
OID=".1.3.6.1.4.1.3199.10.28.1.2.13"/>
<ENTRY NAME="CPUMBufClusterFree"<ENTRY NAME="PacketsDropped"
OID=".1.3.6.1.4.1.3199.10.28.1.1.3.1.14/>
<ENTRY NAME="PacketsForwarded"
OID=".1.3.6.1.4.1.3199.10.28.1.1.3.1.15/>
</DEFINE>
<COMPONENT NAME = "XYZ">
<PROMPT NAME="%COMMUNITY_STRING" PARAMETER="VRF Community
String"/>
<PROMPT NAME="index1" PARAMETER="Interface Number"/>
<PROMPT NAME="index2" PARAMETER="Protocol Number"/>
<METRIC NAME="Total Memory in Heap"
POLLBYDEFAULT="no"
STACK="(CPUMemHeapTotal/NUM) DELTA"
INDEX="index1">
</METRIC>
<METRIC NAME="Free Memory in Heap"
POLLBYDEFAULT="no"
STACK="(CPUMemHeapFree/NUM) DELTA"
INDEX="index1">
</METRIC>
<METRIC NAME="Free MBuf cluster in the CPU"
POLLBYDEFAULT="no"
STACK="(CPUMBufClusterFree/NUM) DELTA"
INDEX="index2">
</METRIC>
<METRIC NAME="Number of packets dropped"
<!-- This is a comment. This sample continues on the next page-->
```

```
                    <METRIC NAME="Number of packets dropped"
                    POLLBYDEFAULT="no"
                    STACK="(PacketsDropped/NUM) DELTA"
                    INDEX ="index2">
                    </METRIC>
                    <METRIC NAME="Number of packets forwarded"
                    POLLBYDEFAULT="no"
                    STACK="(PacketsForwarded/NUM) DELTA"
                    INDEX="index2">
                    </METRIC>
                    </COMPONENT>
                    </METRICFILE>
```

Updating the Data Viewer agent map file

Use this procedure to update the Data Viewer agent map file. The Data Viewer map file maps the client session to Preside Multiservice Data Manager (MDM) servers. Clients open sessions with the Data Viewer agent. The agent connects to the corresponding MDM servers. Once connected to the servers, the agent provides information to the graphic user interface (GUI).

Use this procedure for SNMP devices only.

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 file.

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.

Variable definitions

Variable	Definition
device type	defines the device.
metric file with full path name	defines the file name and the location of the metrics file for the device type

Updating the PMDCD configuration file

Use this procedure to update the PMDCD configuration file to allow the Data Viewer data collection daemon to collect and display real-time performance information for Simple Network Management Protocol (SNMP) devices in the network.

Use this procedure for Passport and SNMP devices only.

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 file.

3   Add the device type and sysName OID:

   sysName:<device type>:<sysName OID>

4   Save the changes and close the file.

Variable definitions

Variable	Definition
device type	defines the device type.
sysName OID	defines the system object identifier

Updating an existing metric file

Update an existing metric file when a metrics file has already been defined and only minor changes need to be made.

Instructions support SNMP devices, and Passport unless other wise indicated.

Note: You cannot update or customize the MPE metric file in this release.

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 307).

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 file.

6   Modify the path name of the metric file associated with the device type.

7   Save the changes and close the file.

Chapter 3
Data Viewer real-time collection

Use Data Viewer real-time collection procedures to collect, display, and analyze performance information in real-time mode for component monitoring and diagnostics.

Prerequisites for collecting real-time statistics

- To use Data Viewer in real-time mode, the user must have permission to authenticate using a device.

Navigation

Metrics collection procedures navigation

- "Collecting performance information for single or multiple component instances" (page 36)

Data recording procedures navigation

- "Recording component information to a Data Viewer Saved Statistics file" (page 42)

- "Viewing a Data Viewer Saved Statistics file" (page 44)

Collecting performance information for single or multiple component instances

Use this procedure to collect performance information for single or multiple components in real-time.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

Data Viewer supports performance collection from MPE for single component instances only. If multiple component instances are specified, they are ignored. Only the index specified by the user in the Input Request dialog is used for polling.

Navigation

Prerequisites

- The Data Viewer must be running in real-time mode.

- If starting the Data Viewer from within another fault management tool, begin at step 6 of this procedure.

Procedure steps

1 In the **Data Viewer** window enter the device name in the **Device Name** field, or click the down arrow of the **Device Name** field to scroll to the device name, or click **Search** to expand the dialog and enter device name search criteria.

2 Click **OK**.

The **Data Viewer - Group Authentication** dialog opens if you have not previously authenticated.

3 Click the down arrow next to the **Group** field and select a group.

4 Click the down arrow next to **Userid** field and select a user ID.

5 Enter your password if the password field is not automatically populated.

6   Click **OK**.

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

7   Specify the component to monitor by performing 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. Specify an instance.

- If a "?" 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.

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

A "?" after a component name indicates that there are multiple instances of that component. Specify the instance for each of these components by doing one of the following:

- 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).

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

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

Note: MPE 9500 devices do not support monitoring of multiple component instances.

9   If the metrics for the selected component(s) require an index, the **Index Request** dialog opens.

10   If the metric for the selected component requires a community string, enter a value for the Community String in the dialog.

11   If the metric for the selected component requires an index, enter a number value for the **Index Number** into the dialog.

12 If there have been changes resulting from step 10 or step 11, press **Accept**.

The metrics that are available for the component appear in the **Available Metrics** list.

13 In the **Max Components** field, enter the maximum number of components to monitor. Enter a number in this field if a wildcard (*) or a range of sequential component numbers is entered into the Component field.

The metrics available for the selected components appear in the **Available Metrics** list. Add new metrics for the components if required. For information on adding metrics see "Creating a new metric file" (page 25).

Note: MPE devices do not support monitoring of multiple component instances.

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

The default is 60 seconds.

For	Polling interval range
SNMP devices	30 to 600 seconds
Passport	30 to 600 seconds
MPE	5 to 600 seconds

CAUTION:
Selecting a low polling interval when multiple devices are selected can flood the network and affect its performance.

15 To limit the number of times data is collected for this component, enter a number into the **Number of Polls** field.

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

If the **Number of Polls** is empty, data collection continues until the user clicks **Pause** or **Stop,** or selects **File** -> **Exit** from the Data Viewer.

16   In the **Available Metrics** list, click the metric name in the **Available Metrics** list.

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

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

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.

19   Press **Start**.

20   Click **OK**.

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.

If necessary, change the order of the columns in the data panel area and sort the values for each metric in ascending order.

21   Optionally, click **Reset** to change the MPE component to collect data on. Repeat step 9 to step 20.

22   Optionally, from the **View** menu, change the view.

View detailed performance information about each component. See "Viewing summary and detailed performance information" (page 62).

Components selection job aid

A "?" after a component name in the **Component** field indicates that there are multiple instances of that component.

Note: MPE devices do not support polling of multiple component instances. If multiple component instances are specified, they are ignored. Only the index specified by the user in the Input Request dialog is used for polling.

To select multiple component instances to monitor, enter one of the following after the forward slash:

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

  For Passport, 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 "*" for multiple component display, since context supplies only single component names. If the Passport version supports it, use the component administration system (CAS) extended wild carding. 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.

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

  Note: Do not target too many components using extended Ricardian as this can negatively impact the performance of both the Passport 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).

- 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).

Controlling data collection in real-time job aid

One of the following actions are possible:

- 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**.

- To restart polling using the same settings, click **Start**.

Recording component information to a Data Viewer Saved Statistics file

Use this procedure to record data files, and write the component information to a Data Viewer Saved Statistics file for future reference.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

- "Prerequisites" (page 42)
- "Procedure steps" (page 42)

Prerequisites

- The Data Viewer must be in real-time mode.

- Saved files must not exceed 10 Mega bytes. When this limit is reached, the file should be closed and a new file opened.

Procedure steps

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

2 From the **Data Recording Options** dialog, select one of the following options:

- **Record Starting Now** saves all the data the Data Viewer has collected since start-up

- **Record All Available Data** saves the metric data that the Data Viewer collects during the next and subsequent polling intervals

3 Click **OK**.

4 From the **Select Recording File** dialog, 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 Select **Open** for new files.

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

6 When selecting an existing file name, the **Legacy 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. Enter the name of the file 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

Use this procedure to view the Data Viewer Saved Statistics file after saving the component information.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

•   "Prerequisites" (page 44)

•   "Procedure steps" (page 44)

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.

```
─ View File: /home/shlam/pp_DV_20040212T114722_ATHEN ┐

File  Help

Index/Component/TYPE=STR,Time/TYPE=STR,CPU Utilization (%)/TYPE=BIG,Fast Ram
EM/ATHENS SHELF CARD/4,02/12 11:44:35,0,0.0,0.15,14.3,0.0,0.0
EM/ATHENS SHELF CARD/1,02/12 11:44:35,7,0.0,0.39,33.27,0.98,100.0
EM/ATHENS SHELF CARD/0,02/12 11:44:35,15,0.0,0.78,69.49,6.15,100.0
EM/ATHENS SHELF CARD/4,02/12 11:44:45,0,0.0,0.15,14.3,0.0,0.0
EM/ATHENS SHELF CARD/1,02/12 11:44:45,6,0.0,0.39,33.27,0.98,100.0
EM/ATHENS SHELF CARD/0,02/12 11:44:45,74,0.0,0.78,69.49,6.15,100.0
EM/ATHENS SHELF CARD/4,02/12 11:44:54,0,0.0,0.15,14.3,0.0,0.0
EM/ATHENS SHELF CARD/1,02/12 11:44:54,6,0.0,0.39,33.27,0.98,100.0
EM/ATHENS SHELF CARD/0,02/12 11:44:54,9,0.0,0.78,69.49,6.15,100.0
EM/ATHENS SHELF CARD/4,02/12 11:45:05,0,0.0,0.15,14.3,0.0,0.0
EM/ATHENS SHELF CARD/1,02/12 11:45:05,6,0.0,0.39,33.27,0.98,100.0
EM/ATHENS SHELF CARD/0,02/12 11:45:05,10,0.0,0.91,69.49,6.15,100.0
EM/ATHENS SHELF CARD/4,02/12 11:45:14,1,0.0,0.15,14.3,0.0,0.0
EM/ATHENS SHELF CARD/1,02/12 11:45:14,7,0.0,0.39,33.27,0.98,100.0
EM/ATHENS SHELF CARD/0,02/12 11:45:14,5,0.0,0.78,69.48,6.15,100.0
EM/ATHENS SHELF CARD/4,02/12 11:45:24,1,0.0,0.15,14.3,0.0,0.0
```

If a Data Viewer Saved Statistics file is open, the name of the open Data Viewer Saved Statistics file appears in the window. 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. When viewing the current Data Viewer Saved Statistics file, new data is continuously written to the file as received.

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

Chapter 4
Data Viewer retrieval of collected metrics

The Preside Multiservice Data Manager Data Viewer tool in replay mode is used to analyze collected performance information for planning, pattern analysis and fault cause analysis.

Prerequisites to retrieving collected metrics

To use Data Viewer in replay mode, files of one of the following types needs to have been previously collected and saved:

- BDF

- Data Viewer Saved Statistics

- Streamed Passport Statistics

- Statistical Retrieval System

Retrieving data files

Replay BDF, Data Viewer Saved Statistics, Streamed Passport Statistics, Statistical Retrieval System files on a local workstation, and from an Operator Client after data has been collected.

> *Note:* When using Operator Client to view BDF files, ensure that BDF data files have be transferred to the local directory for Operator Client.

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.

If the BDF files were recorded using an older version of the RDF files and the data record does not contain the current RDF version, use the **Select RDF** option to select the corresponding RDF for the BDF files. Begin the following procedure at step 5. See 241-6001-309 *Preside MDM Management Data Provider User Guide* for information on managing BDF data, and customizing RDF data records.

Instructions support both the Toolset and Operator Client environments unless other wise indicated.

Navigation

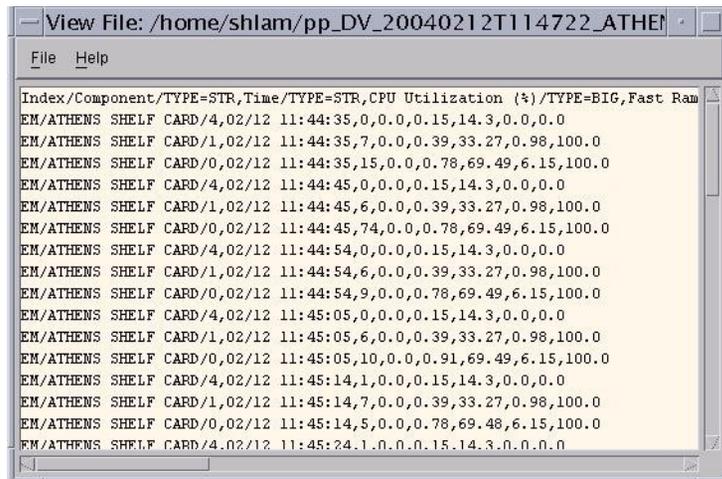- "Prerequisites" (page 48)
- "Procedure steps" (page 48)
- "Data Viewer file selection job aid" (page 51)

Prerequisites

The Data Viewer must be in replay mode.

Procedure steps

1   Use this table to select the appropriate access method.

For	Go to
local access	step 5
remote access	step 2
Operator Client access	step 3

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

3   From the Operator Client Data Viewer **Options** menu, choose **Replay Mode**.

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

5   To use the default RDF, go to step 7, otherwise, continue with this step. From the **Options** menu, choose **Select RDF**.
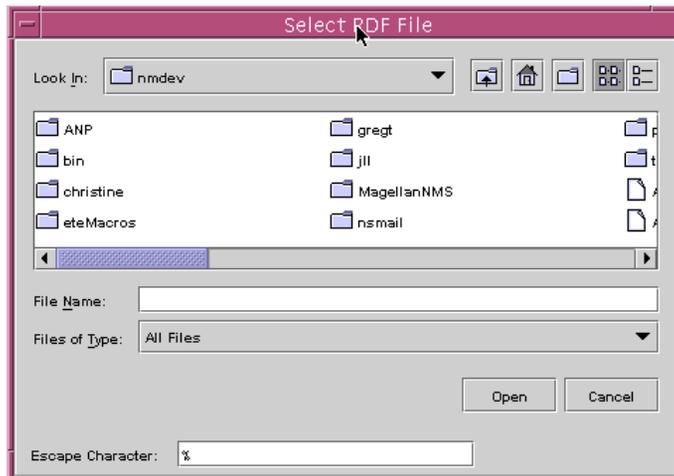
6   From the **Select RDF File** dialog, select an RDF file and click **Open**.

7   In the **File Retrieval** section of the **Data Viewer** replay mode 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, Statistics Retrieval System, SCN, Statistics, Streamed Passport Statistics

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

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

9   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

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

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

- Use **End Date** to specify a range of end date (yyyy/mm/dd) and time (hh:mm:ss) of the filename to be filtered. Any files with an end date and time earlier than the End Date are selected.

11 Click **Retrieve Files** to add data files.
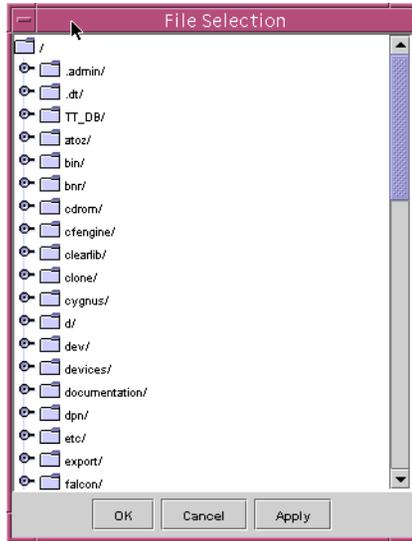
12 Select the file(s) from the **File Selection** dialog and click **OK**. For information on how to select multiple files or file ranges, see "Data Viewer file selection job aid" (page 51)

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

14 Select the file(s) to view from the **Files Selected** area.

15 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.

16 To view multiple files with the same data type, use Shift+click (to select a group of consecutive files) or Ctrl+click (to select individual files).

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

Data Viewer file selection job aid

For instruction on how to select a file, a range of files, or multiple files from the file selection dialog use this job aid.

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 the selections.

To select multiple files

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

Chapter 5
Data Viewer basic procedures

Use Data Viewer basic procedures for operations such as starting and stopping, or managing the interface of the Data Viewer from the Preside Multiservice Data Manager Toolset and from Operator client in both real-time and replay modes.

Navigation

Real-time mode

Replay mode

Real-time and replay modes

Controlling the display of performance information

Viewing performance information

- "Changing the color assigned to a metric" (page 58)

- "Managing the graphical display" (page 59)

- "Removing files from the Files Selected area" (page 60)

Starting the Data Viewer in real-time mode

Use this procedure to start Data Viewer in real-time mode to analyze performance data.

Figure 1, "Toolset performance management tools," (page 49) shows performance management tools available from the Preside Multiservice Data Manager Toolset.

Figure 1
Toolset performance management tools
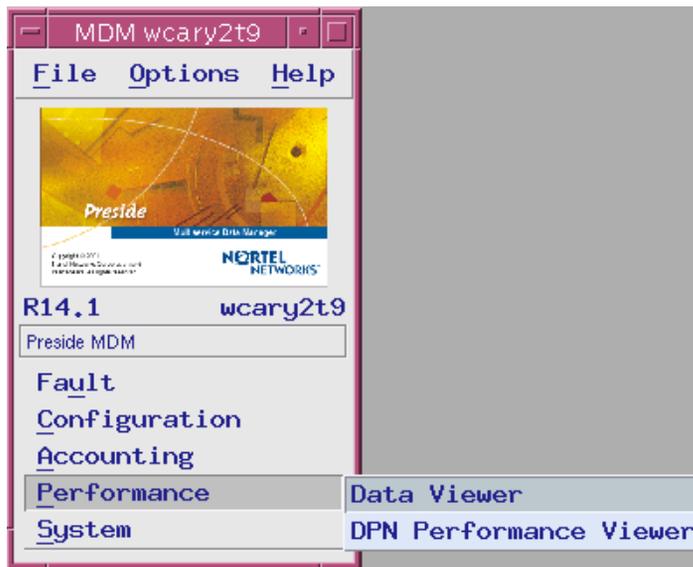
Figure 2, "Operator client toolset performance management tools," (page 50) shows performance management tools available from the Operator client.

Figure 2
Operator client toolset performance management tools

Procedure steps

If running Toolset, see...	If running Operator client, see...
step 1	step 2

1 In the application main window, select **Performance** -> **Data Viewer**.

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

2 In the **Operator client** window, select **Performance** -> **Data Viewer** from the menu.

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

Use this procedure to start the Data Viewer from the following fault management tools:

If running Toolset	If running Operator client
• Network Viewer	• Network Browser
• Component Information Viewer	• Component Information Viewer
• Component Status Display	• Alarm Display
• Network Status Bar	• Passport Shelf View
• Alarm Display	• MPE Shelf View
• Passport Shelf View	• Passport Nodal Provisioning
• MPE Shelf View	• MPE Nodal Provisioning
• Passport Nodal Provisioning	
• MPE Nodal Provisioning	

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 **Data Viewer** window opens.

Starting other fault management tools from Data Viewer

Use this procedure to start other fault management tools from Data Viewer using Start Tool. The following tools can be started from Data Viewer:

If running Toolset	If running Operator client
• Network Viewer	• Network Browser
• Component Information Viewer	• Component Information Viewer
• Component Status Display	• Alarm Display
• Network Status Bar	• Passport Shelf View
• Alarm Display	• MPE Shelf View
• Passport Shelf View	• Passport Nodal Provisioning
• MPE Shelf View	• MPE Nodal Provisioning
• Passport Nodal Provisioning	
• MPE Nodal Provisioning	

Procedure steps

1 From the Data Viewer tool, right click in the data panel area and select the **Start Tool** menu.

2 From the pop-up menu, select an FCAP label and the tool name.

The selected fault tool opens in a new window.

Starting the Data Viewer in replay mode

Use this procedure to start the Data Viewer in replay mode to analyze
collected data at a later date

Procedure steps

If running Toolset, see...	If running Operator client, see...
step 1	steps 2 and 3

3   In the application main window, select **Accounting** -> **Data Viewer**.

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

4   In the **Operator client** window, select **Performance** -> **Data Viewer** from
the menu.

The **Data Viewer** window opens in real-time mode.

5   In the **Data Viewer** window, select **Options** -> **Replay Mode** from the
menu.

The **Data Viewer** switches to replay mode.

Exiting the Data Viewer

Use this procedure to exit the Data Viewer.

Procedure steps

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

All open windows close and history for the session is discarded.

Rearranging data display

Use this procedure to sort the values and change the order of the data columns.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

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 and replay modes)

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 or descending order, click in the column header for the metric.

Viewing summary and detailed performance information

Use this procedure to view detailed and summary information collected for each component.

The information is displayed in the **Graph** window, in both table and graphic formats.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

Procedure steps

1   In the data panel area, click in a component row.

2   Click **Graph**.

The **Graph** window opens. To monitor multiple components, launch multiple versions of the **Graph** window. See "Managing the graphical display" (page 59).
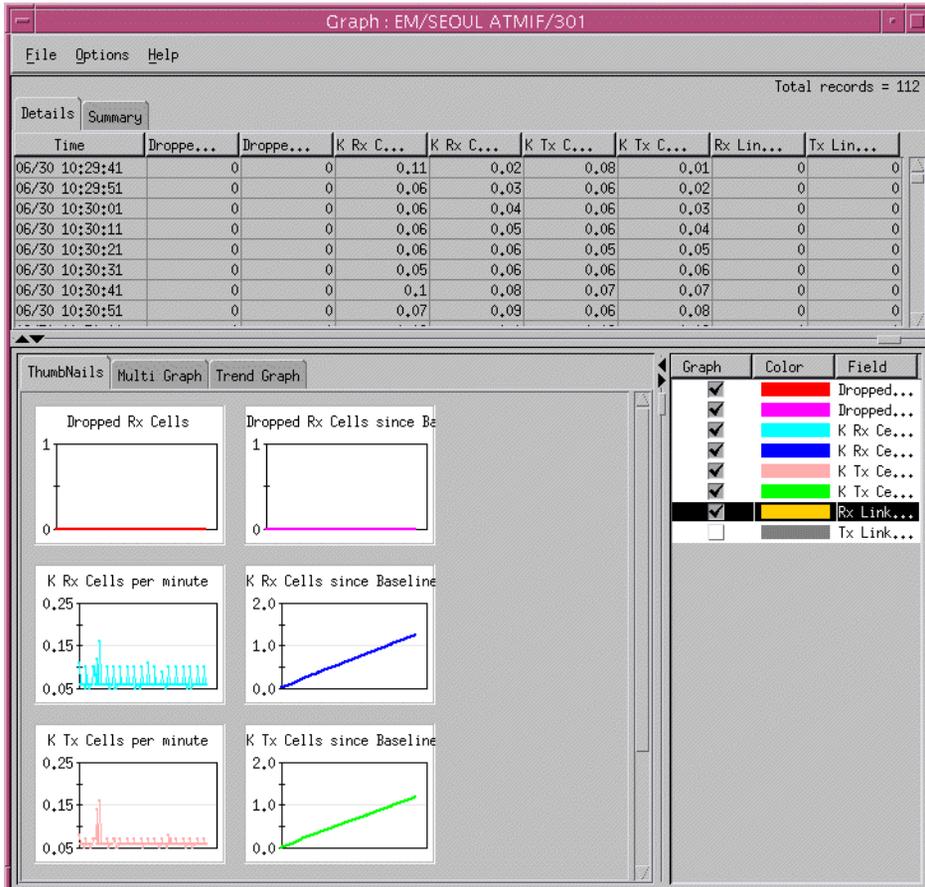
This sample screen displays detailed information about one component.

3   Click the **Detail** tab to view detailed information.

4   Click the **Summary** tab to view summary information.

Changing the color assigned to a metric

Use this procedure to change the color assigned to a metric. For more information on graphs see "Managing the graphical display" (page 59).

Instructions support both the Toolset and Operator client environments unless other wise indicated.

Procedure steps

1   In the data panel area, click in a component row.

2   Click **Graph**.

The **Graph** window opens.

3   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 allow selection or color mixing for the metric.

4   Choose a new color for the metric.

5   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.

Managing the graphical display

Use this procedure to specify performance data to view in thumbnails, multi graphs or trend graphs, and in line or bar graph format.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

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 selected 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 selected 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, 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.

Removing files from the Files Selected area

Use this procedure to remove one or more files data files while working with collected data.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

Prerequisites

The Data Viewer must be in replay mode.

Procedure steps

1   Select the file(s) to view from the **Files Selected** area.

2   Click **Remove Selected**.

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

Removing all files from the Files Selected area

Use this procedure to remove all files.

Instructions support both the Toolset and Operator client environments unless other wise indicated.

Prerequisites

The Data Viewer must be in replay mode.

Procedure steps

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

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

Chapter 6
Data Viewer window

This section contains descriptions for all the main components in the Data Viewer windows for real-time mode and replay mode.

Navigation

Data Viewer window for real-time mode

The Data Viewer window for real-time mode is described in this section.

Data Viewer window - Real-time mode in latest poll view
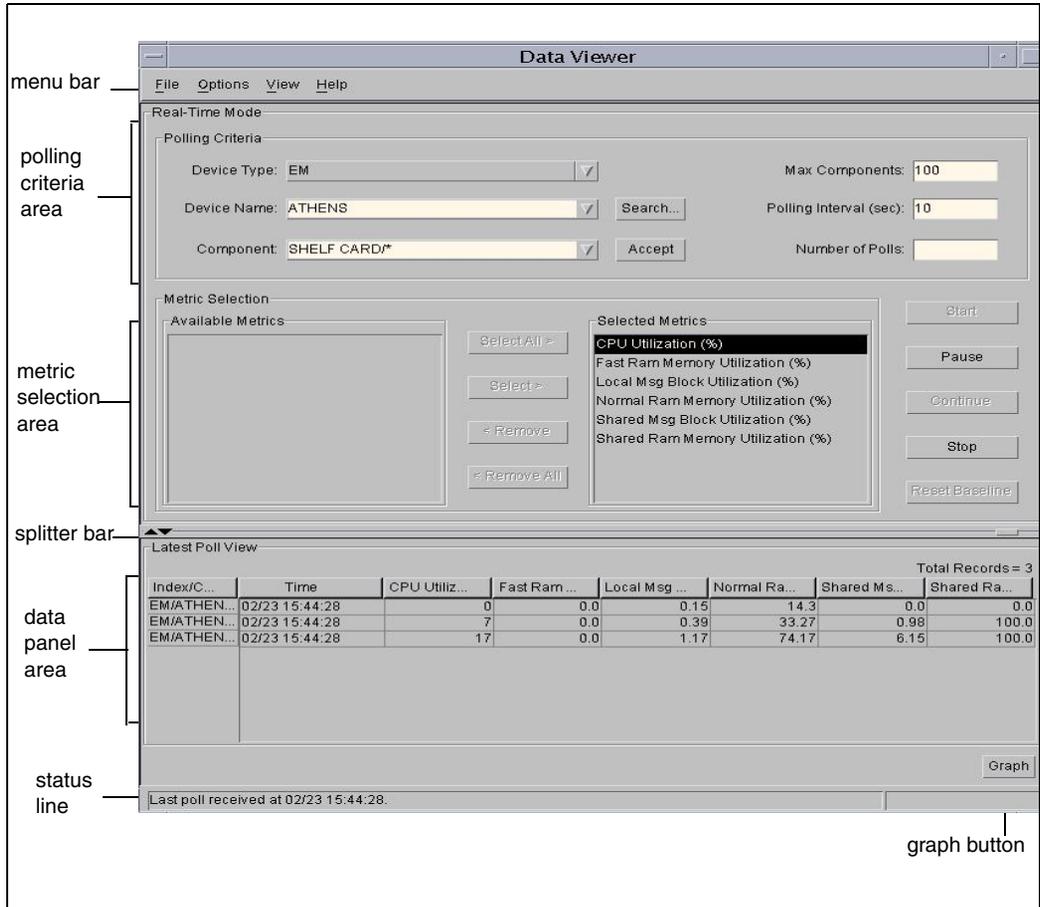
Navigation

- • "Graph button" (page 77)

- • "Dialog boxes" (page 77)

Splitter bar

A splitter bar between the metric selection area and the data panel area divides the **Data Viewer** window into two adjustable window panes. The window panes adjusts 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.

Menu bar

The menu bar organizes commands into the following menus:

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 displays connection status information.
Start Recording	Writes statistical data, including baseline-delta statistics, to the Data Viewer Saved Statistics file. Provides the option to overwrite an existing Data Viewer Saved Statistics file or start a new file with a new name. The file is placed in the home directory, unless an absolute pathname is specified. 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.
Stop Recording	Stops output to the Data Viewer Saved Statistics file and saves and closes the file.
	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. Reset all baseline values collected from the first poll taken by clicking **Continue**.
View Recording	Displays the **View File** window. From the window, select a file to view. View baseline delta statistics also. By selecting the file that is currently open, new data is written to the file as it is received.
	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.

Options menu

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

Replay Mode	Retrieves collected data. When this option is selected, Replay Mode is enabled and Real-Time Mode is disabled.
Real-Time Mode	Collects and displays real-time statistical data from different devices.

View menu

The **View** menu contains a list of data views. The selected view is displayed in the data panel area. 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, "Views" (page 95).

Help menu

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

Help On Window	Provides descriptive help information about a window.
What's This?	Displays information about a selected area of the window.

Polling criteria area

In the polling criteria area in the Data Viewer window, specify the device and associated component(s) from which to gather information, and the polling interval.

The polling criteria area contains six fields:

- **Device Type** specifies 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** lists device names for the device type. Enter the device name or select an item from the menu. If the device type for Passport is selected, the **Authenticate** dialog prompts for the group, use name and password.

- **Component** specifies the component(s) to monitor. The **Component** field contains a list of the component types that are defined in the metric file. Select one component to monitor for MPE_9500, or one or more components to monitor for a Passport.

- **Max Components** specifies 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. Enter a number in this field when selecting multiple components using either the wildcard (*) or a range of component numbers.

  This attribute does not apply to MPE devices.

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

- **Polling interval (Secs)** specifies the polling interval (in seconds) for data collection. The polling interval has a range of 30 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 10 seconds to 600 seconds. For MPE_9500 devices, the polling interval range is 5 seconds to 600 seconds. The default for both Passport and MPE_9500 devices 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. A polling interval of less than 30 seconds is not recommended.

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

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

- **Number of Polls** specifies the number of polls to execute during the polling session. If a number is entered in the field, polling stops when this number is reached. If a number is not entered, polling continues until the tool stops, polling pauses or stops, or monitoring starts on another component.

Metric selection area

Use the **Metric Selection** area in the Data Viewer window to 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. Select any or all of the metrics from this list for polling. Right-click a metric to display a description of the metric.

- **Selected Metrics** lists the metrics that are selected for polling. Remove any metric from this list by clicking the metric name, and then clicking the left arrow. Right-click a metric to display a description of the metric.

- Use **Select All** to select all available metrics to be polled. The metrics are moved from the **Available Metrics** list to the **Selected Metrics** list. This option is grayed out if there are no metrics in the **Available Metrics** section.

- Use **Select** to select a specific metric to be polled. The metric is moved from the **Available Metrics** list to the **Selected Metrics** list. This option is grayed out if no metrics are selected in the **Available Metrics** section.

- Use **Remove** to remove a specific metric to be polled. The metric is moved from the **Selected Metrics** list to the **Available Metrics** list. The Remove option is grayed out if no metrics are selected from the **Available Metrics** section.

- Use **Remove All** to remove all metrics to be polled. The metrics are moved from the **Selected Metrics** list to the **Available Metrics** list. This option is grayed out if there are no metrics in the **Selected Metrics** section.

Command buttons

The command buttons in the Data Viewer window control component searches and polling session. The following buttons are available:

Search	Allows the user to find a specific node by searching with the help of filters and pattern matching. The user can specify criteria, such as the node name starting characters to search all the nodes that contain the pattern. The user may also specify the maximum number of matches to display.
Accept	Allows the user to accept the component being polled. Displays the Input dialog for the MPE 9500 component and all available metrics.
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 clicking **Continue**.
Stop	Ends the polling for the current settings. 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.

On a 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.

The status line is dived into three fields. The left-most message field contains a description of the last command that was executed. The middle field which is the last baseline reset time field displays the last time the card or shelf was reset if this information is available. The right-most hostname field displays the nodename to which it is connected. If service selection is made from the Data Viewer window, it will be reflected in the next opened application.

Graph button

Click the Graph button to open the Graph window. See "Graph window" (page 83).

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, Management Data Provider (MDP) collected statistics, Statistics Retrieval System (SRS) and Streamed Passport Statistics (PMSP) files.

Dialog boxes

There are three dialog boxes, one related to authentication, one related to input required to collect MPE statistics, and a third that provides information related to the polling interval.

Navigation

- "Input Request dialog" (page 77)
- "Information dialog" (page 78)
- "View File dialog" (page 78)
- Authentication dialog, see 241-6001-122 *Preside MDM SNM*P *MDM Toolset and Operator Client Basic Operations*

Input Request dialog

The Input Request dialog opens and allows the user to specify the metric index for the component.

Community String	Specifies the community string in use, or where multiple community strings exist, allows the user to specify one.
Interface Number	Allows the user to specify the SNMP index number
OK	Sets all the specified values, initiates a polling request and displays all available metrics for the specified component in the main window.
Cancel	Closes the **Input** dialog. All information in the dialog is ignored.
Help	Displays help on the **Input** dialog.

See the figure "Input Request dialog" (page 78).

Input Request dialog

Information dialog

The **Information** dialog displays the acceptable polling interval range.

View File dialog

The **View File** dialog displays a list of files that collected metrics are written to. From the list, select the file that is currently open. View new data as it is written to the file.

Data Viewer window for replay mode

The Data Viewer window for replay mode is described in this section.

Data Viewer window - Replay mode in spreadsheet view

Navigation

- • "File retrieval criteria area" (page 81)

- • "Files selected area" (page 82)

Menu bar

Use the Data Viewer to view performance information through the menu bar commands. The menu bar contains the following menus:

"File menu" (page 80)	Provides commands related to files and a means to exit the Data Viewer tool.
"Options menu" (page 80)	Controls display of menu bars, icons bars, node labels, background maps, and legends. Also sets preferences and filters.
"View menu" (page 80)	Control which nodes are shown in the network display area. Network model navigation and background zooming can also be performed with these commands.
"Help menu" (page 81)	Gives access to online help.

File menu

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

Exit	Terminates the polling 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 enabled and Replay 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 selected view opens in the data panel area. 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.**

Note: The views are described in the section, "Views" (page 95).

Help menu

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

Help On Window	Provides descriptive help information about a window.
What's This?	Displays information about a selected area of the window.

File retrieval criteria area

Use the file retrieval criteria to select files to replay. The file retrieval criteria area consists of the following input areas:

Note: The maximum file size that can be retrieved is 10 Mega bytes.

• Select the **Data Type** pull-down list for the following data types: **Accounting**, **Alarm**, **All**, **Availability**, **Data Viewer Saved Statistics**, **Log**, **Outage**, **Statistics Retrieval System**, **Scn**, **Statistics**, **Streamed Passport Statistics**. The default is **All** for all data types.

• Select the **Device Type** pull-down list to filter on specific device types: **All**, **DPN**, **Others**, **Passport**, **MPE**. The default is **All** for all device types.

• Use **Device Name** to enter 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

- Use **Start Date** to 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.

- Use **End Date** to 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.

- Use **Retrieve Files** to open the **File Selection** dialog. This dialog is a tree representation of the available directories and files for the selected type. Navigate the file system to locate files for the selected data type. The default directory for the selected Device Type is displayed. The default directory varies depending on the Device Type selected.

Files selected area

The files selected area displays a listing of retrieved files. The files are displayed in tabular format. Click and drag a column heading to reorder the columns.

This area consists of the following 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. The maximum size is 10 Mega bytes.

- **Remove Selected** removes the selected file from the **Files Selected** area.

- **Remove All** removes all files from the **Files Selected** area.

- **View** lists 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 83)

- "Graph window" (page 83)

Data panel area

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) indexID of the component(s) for SNMP devices and MPE_9500, and the component under monitor.

   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.

Graph window

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 85) and "Graph window: Detail panel" (page 86) for sample displays.

Navigation

Splitter bar

A splitter bar separates the summary or detail statistics display into two adjustable window panes. Click the mouse on one of the arrows in the splitter bar to configure window pane size. 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 3
Graph window: Summary panel

title bar

menu bar

statistics
tables

splitter bar

graph
area

graph selection
table
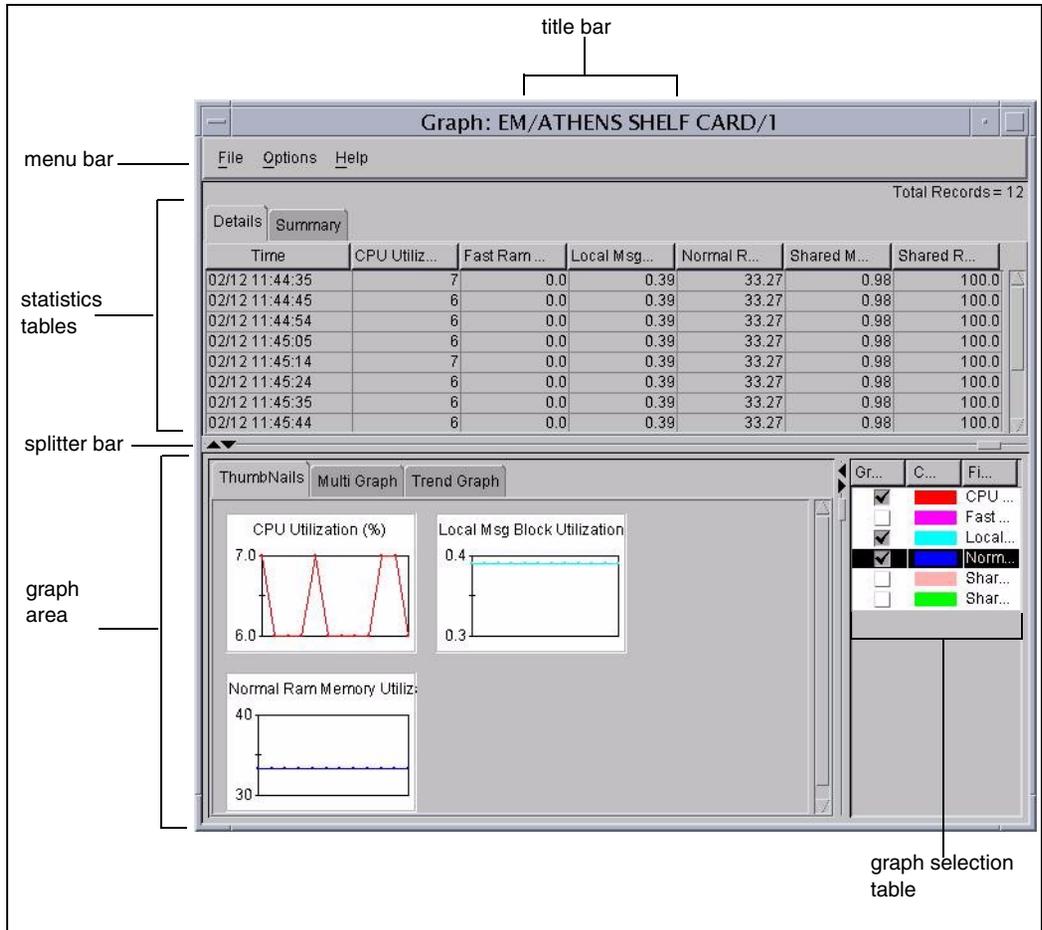
Figure 4
Graph window: Detail panel
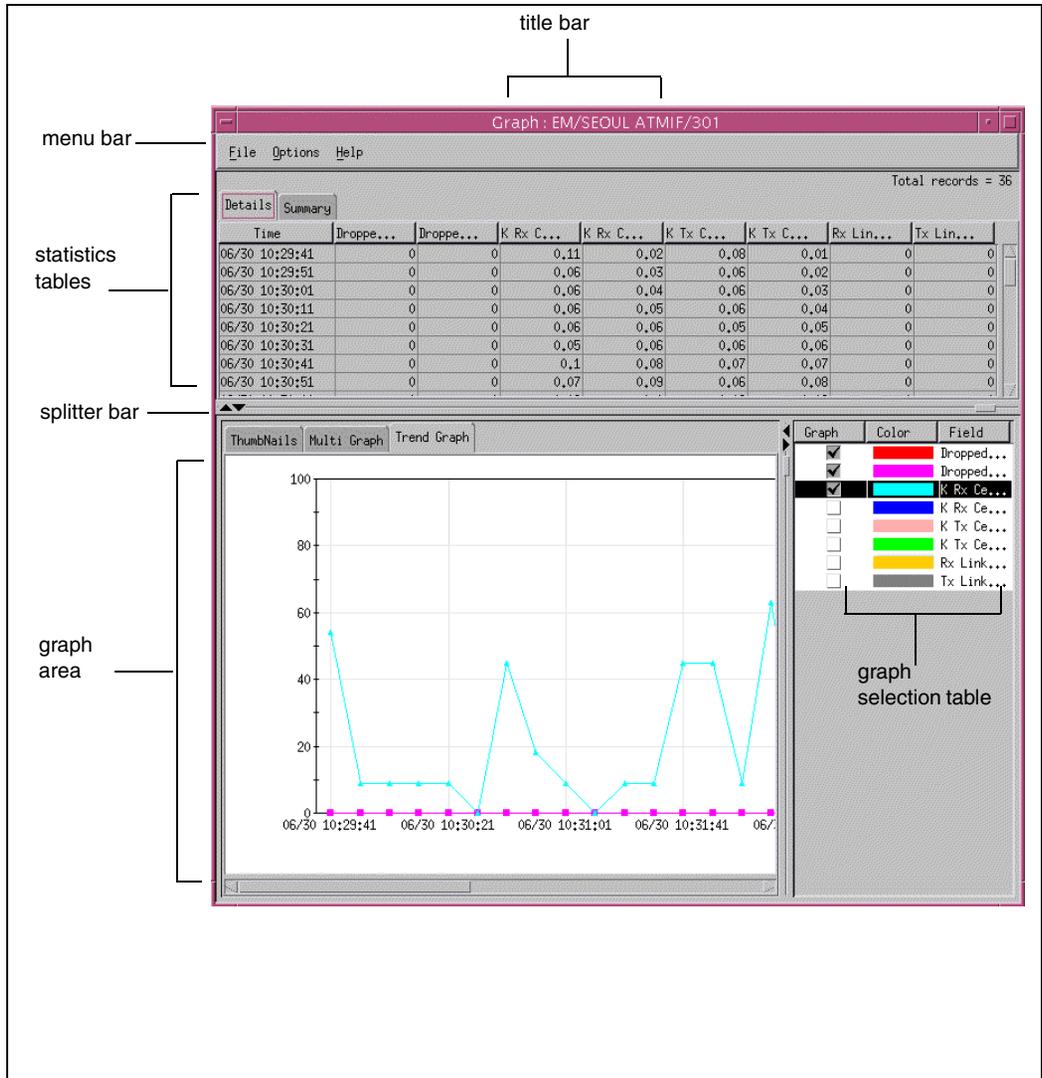
Title bar

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 87)	Provides commands related to files and a means to exit the Data Viewer tool.
"Options menu" (page 87)	Controls display of menu bars, icons bars, node labels, background maps, and legends. Also sets preferences and filters.
"Help menu" (page 87)	Permits access to online help.

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 Window	Provides descriptive help information about a window.
What's This?	Displays information about a selected area of the 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. 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 through 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 through 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. 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 selected metric fields appear in the graph. The line displayed in the graph for each metric field matches the color defined in the graph selection table.

Three types of graphs are available: thumbnail, multi graphs, and trend graphs. Select a graph type by clicking the appropriate tab in the graph area.

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.

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

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 metric fields for graphical display. Only the selected metric fields 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 89).

- **Color** contains the color of the graph associated with a metric fields. A default color is assigned to each metric. Change the color by clicking in the "Color" column for the metric. This launches the "Pick a Color" window.

- **Field** contains the name of the metric fields.

Chapter 7
Data Viewer fundamentals

The Data Viewer tool is a Preside Multiservice Data Manager diagnostic tool that collects, and displays performance information in real-time mode and replay mode for analysis.

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

- "Real time mode" (page 92). See "Menu bar" (page 71) for more information on the menu items specific to real time mode.

- "Replay mode" (page 94). See "Menu bar" (page 80) for more information on the menu items specific to replay mode.

- "Views" (page 95).

- "Graphic display" (page 102)

Data Viewer capabilities

The Data Viewer has the following capabilities:

- The Data Viewer supports the following modes:

  — real-time mode

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

• The Data Viewer supports the following graphic displays:

— thumbnail graphs

— multi graphs

— trend graphs

Real time mode

Note: This section applies to real-time mode. See the following sections: "Replay mode" (page 94), and "Views" (page 95).

Data from Passport, MPE 9500, and Simple Network Management Protocol (SNMP) devices is collected in real-time mode. 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, MPE 9500, and SNMP devices and uses the attributes to derive more meaningful metric values. The Data Viewer also supports 64-bit counters for Passport, MPE 9500, and SNMP devices.

Passport and MPE 9500 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, MPE 9500, 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 MPE 9500, Passport, or SNMP device type to which the file applies. One metric file is required for each MPE 9500, Passport, or SNMP device type.

The metric names appear in the Data Viewer window when a component is selected to monitor. Metrics are chosen for display for each component, during each polling session. The metric values display in both tabular and graphical formats. Metrics and components can be added to the metric file as required.

> *Note:* If the service selected in "Network Access" is changed after the Data Viewer starts when using Operator client, the Data Viewer client is not notified and there is no impact on the connection to the existing Data Viewer server host. Data Viewer must be launched after a service selection change to connect to the new host name specified in the service selection.

Metric files are customized by adding metrics and components as required. To customize a metric file, use a standard UNIX text editor, 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 307).

Working with Data Viewer Saved Statistics files

The Data Viewer may be configured to write the information it collects in real-time mode to a Data Viewer Saved Statistics file and to 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 the home directory, unless an alternate path is specified. Change the default directory by double clicking on the directory name. It is recommended that you use the default saved statistics file name because it has been set up for saved statistic files filtering in replay mode.

> *Note:* Saved statistic files filtering in replay mode may not work properly if the default file name is changed.

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

The figure "Data Viewer Saved Statistics file" (page 94), shows an example of this file.

Figure 5
Data Viewer Saved Statistics file

Replay mode

Note: This section applies to replay time mode. See the following sections: "Real time mode" (page 92), and "Views" (page 95).

In replay mode, 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*.

Views

This section contains information that applies to both real-time mode and replay mode.

The data panel area displays one of the following views:

- spreadsheet

- record

- component

- latest poll

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.

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.

Select a row then click **Graph** to display the detailed statistics table and the summary table. Display summary or detailed statistics by selecting a tab.

Note: The field names are described in "Data panel area" (page 83).

See the following figures:

- "Real-time - Spreadsheet view" (page 96) shows the Data Viewer window in real-time mode and spreadsheet view.

- "Replay - Spreadsheet view" (page 97) shows the Data Viewer window in replay mode and spreadsheet view.

Figure 6
Real-time - Spreadsheet view
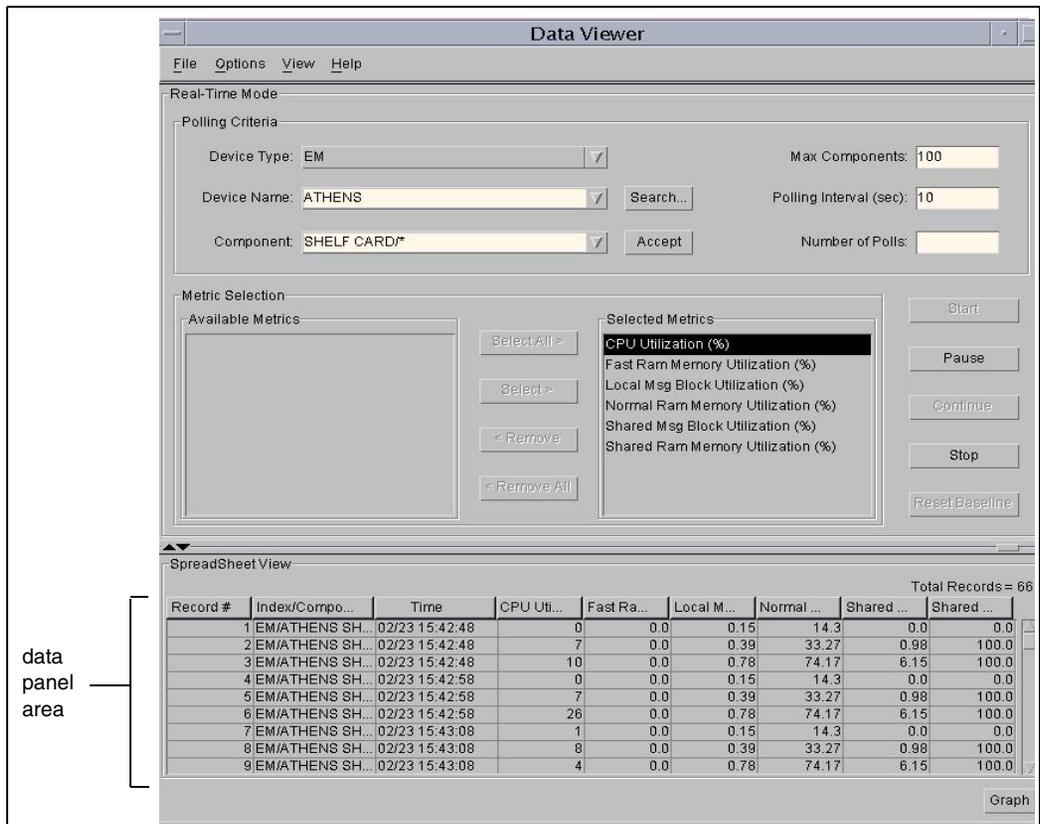
Figure 7
Replay - Spreadsheet view
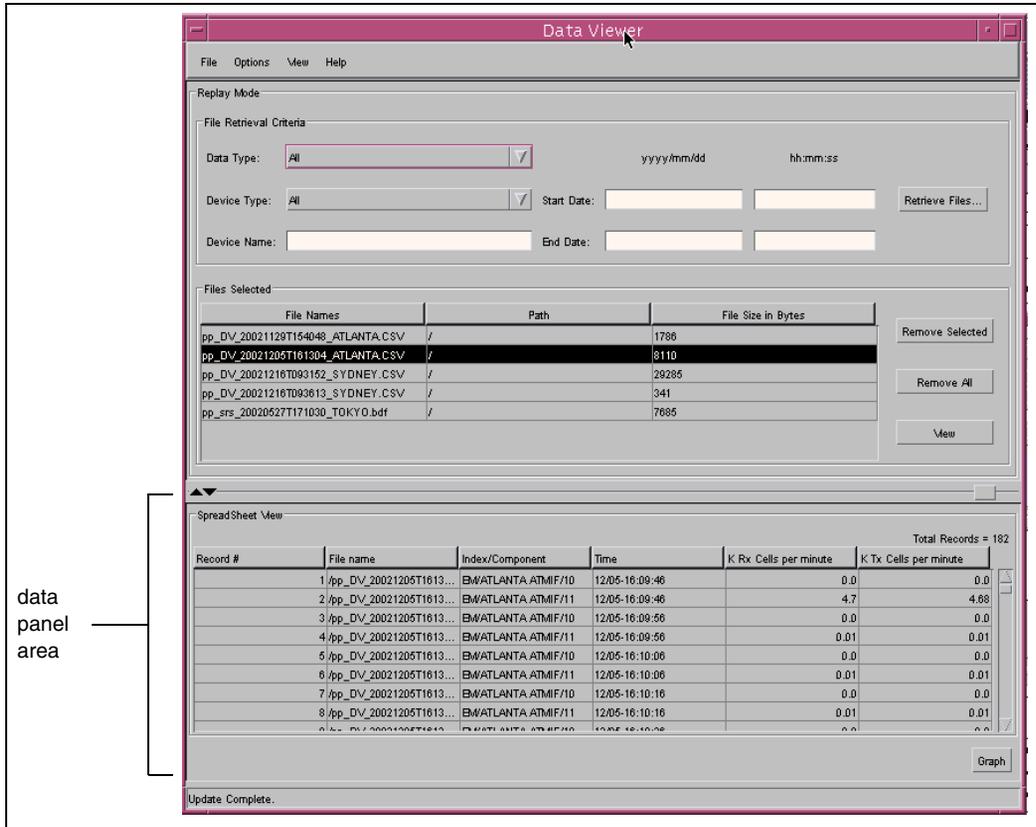
Record view

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.

Select a record number then click **Graph** to view the detailed statistics table and the summary table of the component instance specified in the selected record. Display summary or detailed statistics by selecting a tab.

Note: The field names are described in "Data panel area" (page 83).

See the following figures:

- "Real-time - Record view" (page 98) shows the Data Viewer window in real-time mode and record view.

- "Replay - Record view" (page 99) shows the Data Viewer window in replay mode and record view.

Figure 8
Real-time - Record view
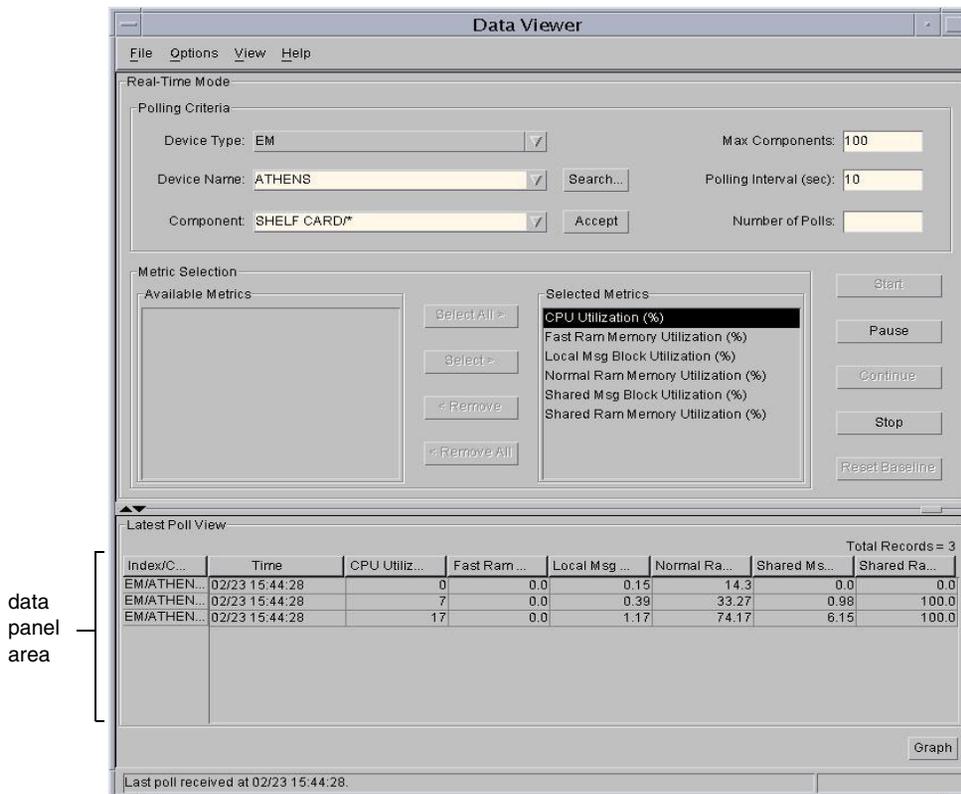
Figure 9
Replay - Record view
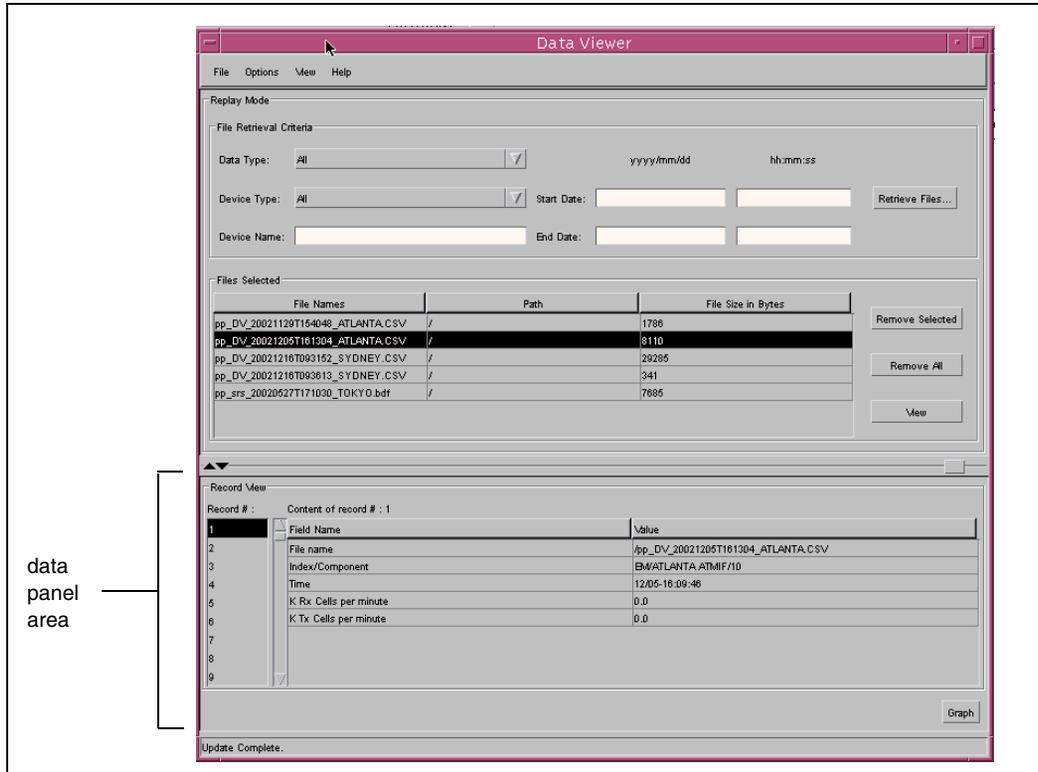
data
panel
area

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. Click **Graph** to view the **Graph** window associated with the selected component. Display summary or detailed statistics by selecting a tab.

Note: The field names are described in "Data panel area" (page 83).

See the following figures:

- "Real-time - Component view" (page 100)
- "Replay - Component view" (page 101)

Figure 10
Real-time - Component view

Figure 11
Replay - Component view

data
panel
area

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. Select
a row then click **Graph** to view detailed statistics table and the summary
table. Display summary or detailed statistics by selecting a tab.

Note: The field names are described in "Data panel area" (page 83).

The figure "Real-time - Latest poll view" (page 102) shows the Data Viewer
window in real-time mode and latest poll view.

Figure 12
Real-time - Latest poll view
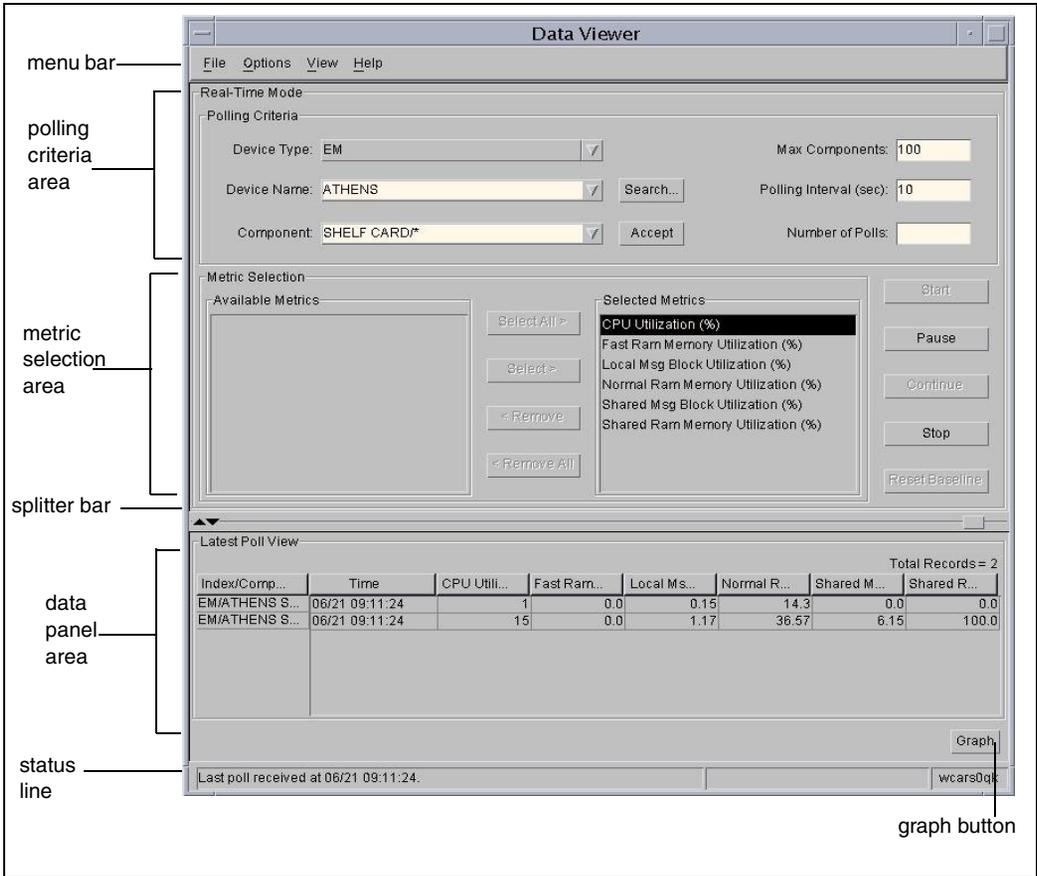
Graphic display

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 selected metric fields appear in the graph. The line displayed
in the graph for each metric field matches the selected color in the graph
selection table.

Three types of graphs are available: thumbnail, multi graphs, and trend graphs. Select a graph type by clicking the appropriate tab in the graph area. From the **Options** menu, 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 104), "Graph window showing multi graphs" (page 105), and "Graph window showing trend graphs" (page 106).

Figure 13
Graph window showing thumbnail graphs
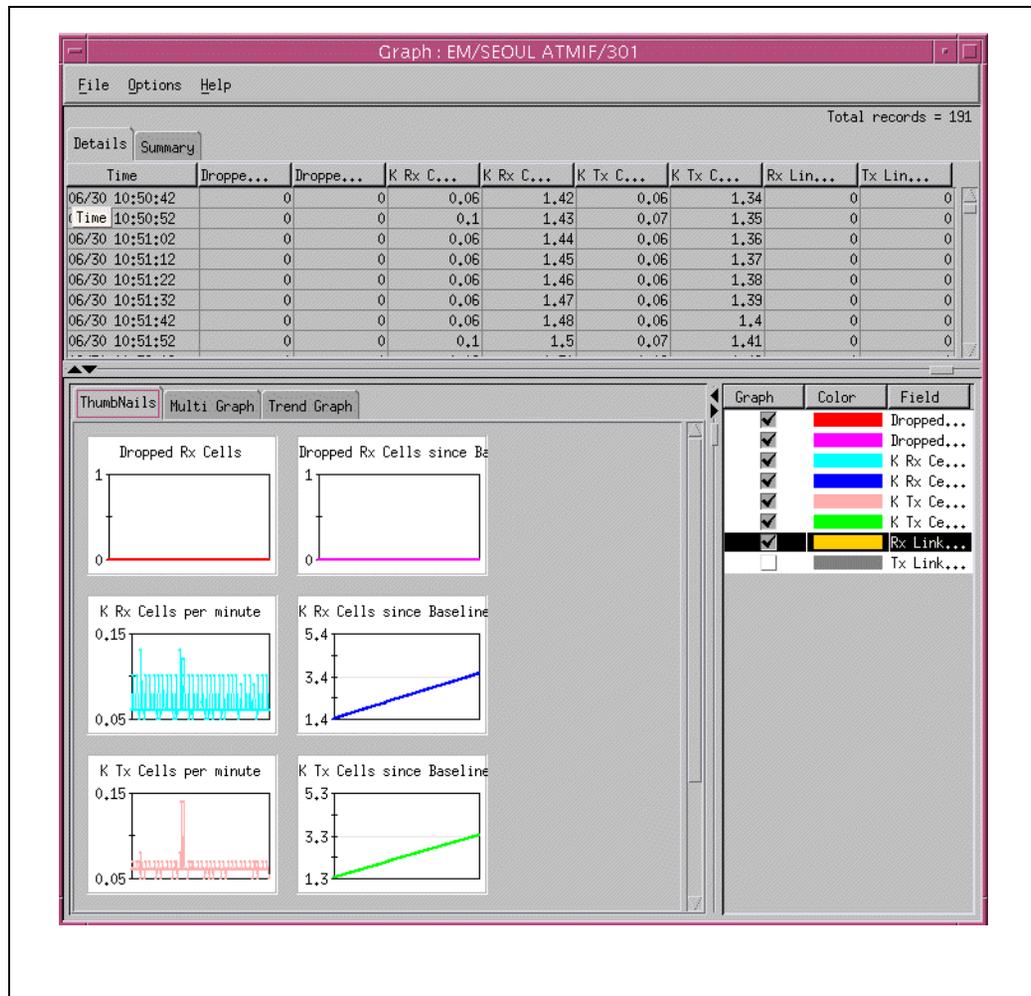
The multi graph shows an absolute graph. The X axis shows the time value. If there is not enough space, not all the time values are displayed in the trend and multi graph panels. Use the horizontal scroll bar to view the other time values. The Y axis shows the field value.

Figure 14
Graph window showing multi graphs
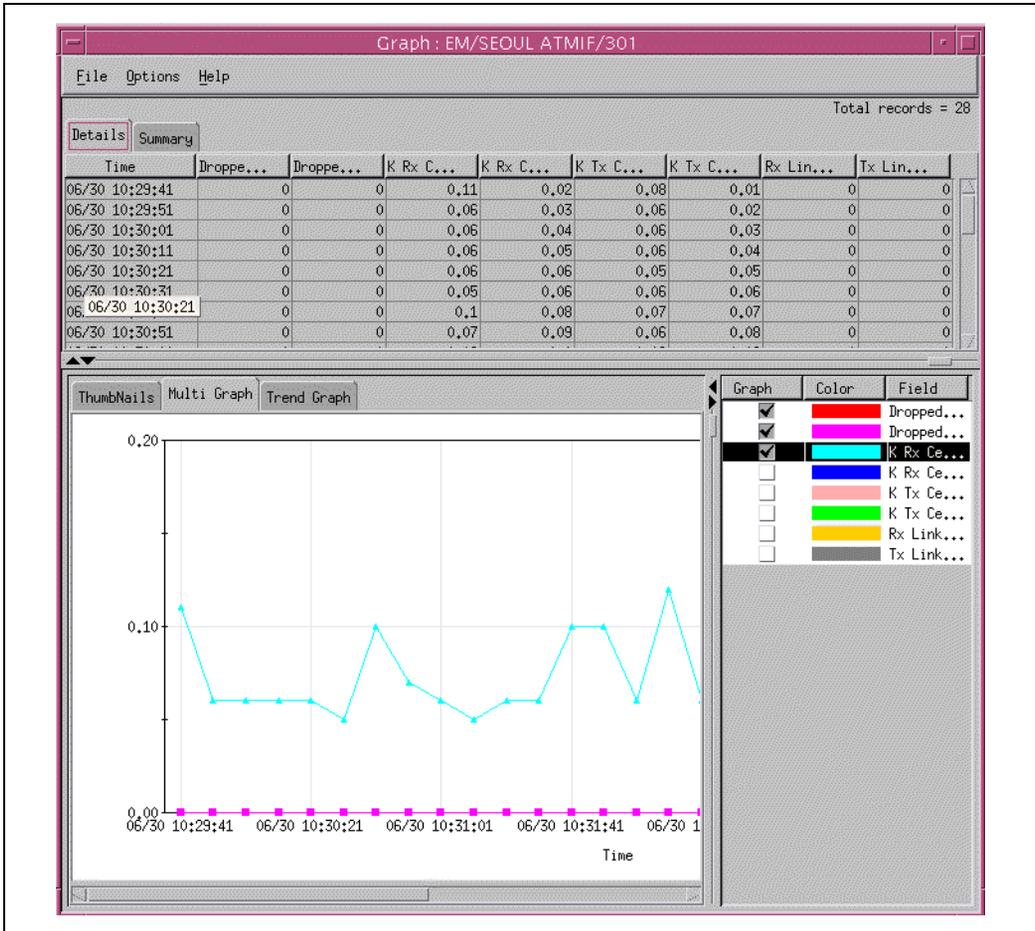
The trend graph is a percentage relative scale with the Y axis showing the field value relative to the maximum. The comparison is with the instance field value to the maximum value on this field that has occurred during the time captured in the trend graph. The X axis shows the time stamps when the field values are polled

Figure 15
Graph window showing trend graphs
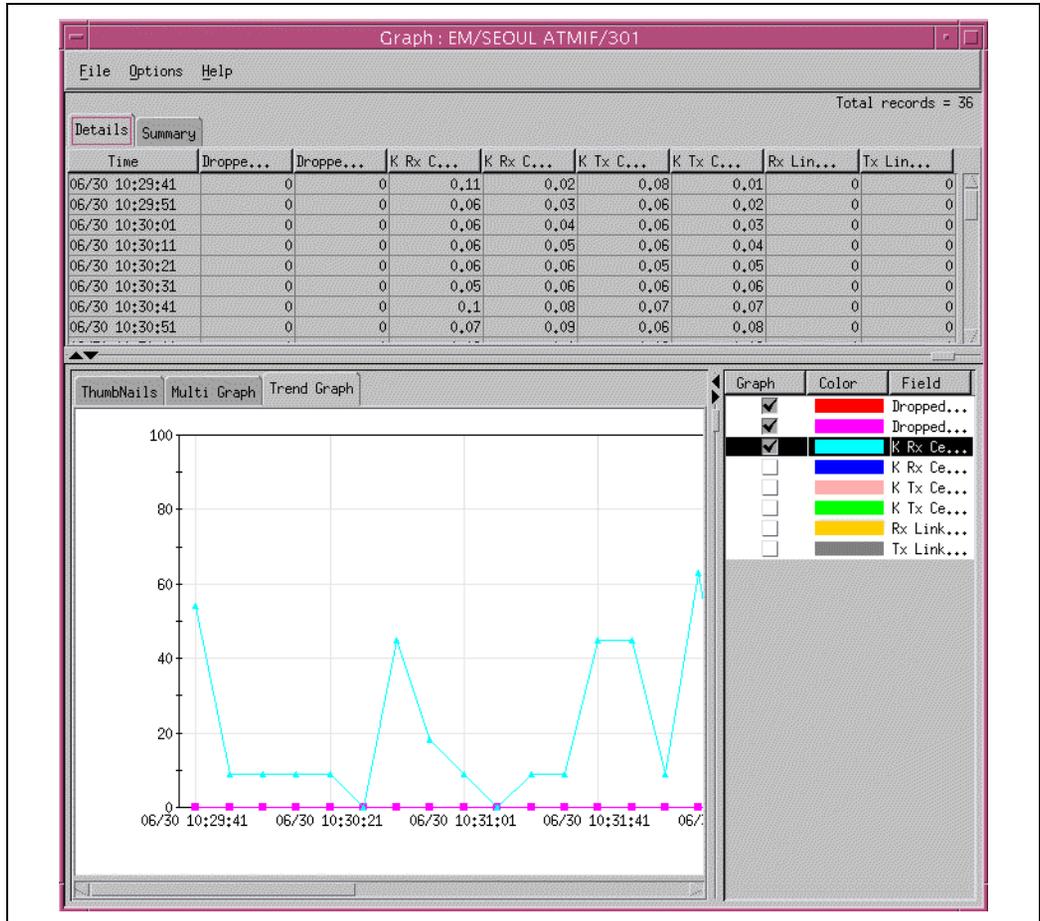
Chapter 8
DPN Performance Viewer

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

- "DPN Performance Viewer overview" (page 107)

- "Performance Viewer window" (page 108)

- "DPN Performance Viewer dialogs" (page 113)

- "DPN Performance Viewer Procedures" (page 120)

- "Customizing DPN Performance Viewer default settings" (page 126)

- "Understanding DPN Performance Viewer log files" (page 127)

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. Select the metrics 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 components under monitor. Write collected information 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 301).

For additional information on the DPN Performance Viewer, see

- "Performance Viewer window" (page 108)

- "DPN Performance Viewer dialogs" (page 113)

- "Keyboard shortcuts" (page 113)

- "Starting the DPN Performance Viewer" (page 120)

- "Displaying component information" (page 121)

- "Controlling the graphic display" (page 123)

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". Configure the relative size of each area by clicking and dragging the mouse over one of the window pane movement boxes. One area can fill the entire DPN Performance Viewer display.

See the figure "Performance Viewer window" (page 109) to view a sample Performance View window.

Figure 16
Performance Viewer window
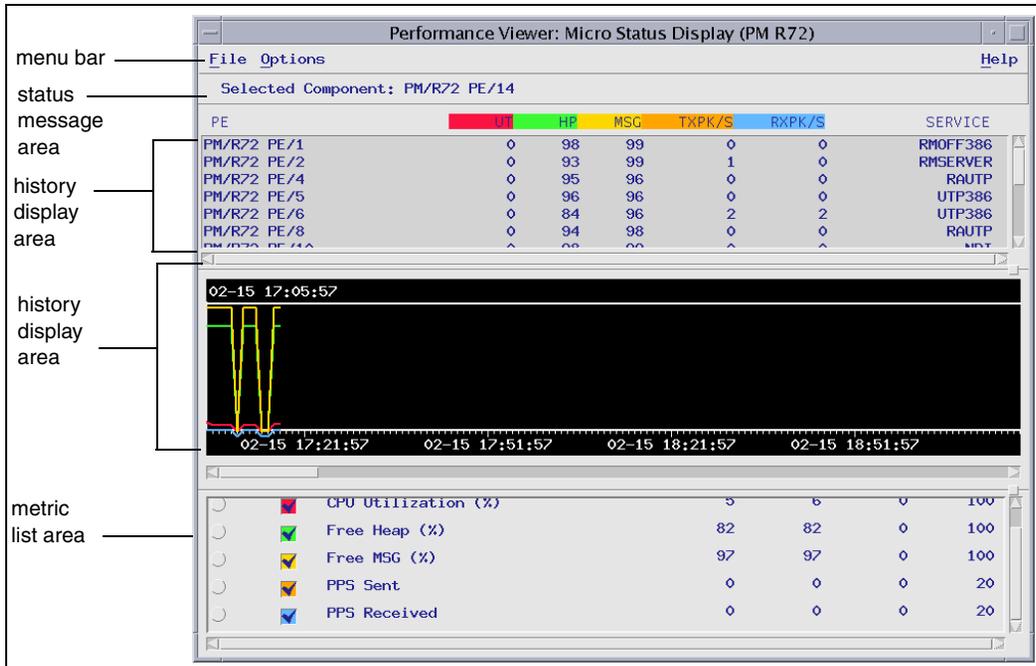
On the first attempt to establish a connection to a network component, or subsequently use the **Change Parameters** command, there is a delay until a response is received from the GMDR. During this delay, the status line just below the menu bar displays a message, and the shape of the cursor turns into 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:

Preside MDM Performance Management User Guide   15.1

- "Shelf display area" (page 112)

- "History display area" (page 112)

- "Metric list area" (page 112)

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 for a file name to save the complete visible metric history. If that filename already exists, it is overwritten. Note the following:

    — The file is placed in the home directory, unless an absolute pathname is specified.

    — The file is updated every time more data is collected until the user selects the Stop Log menu option, exits the DPN Performance Viewer, or changes to a different component.

    — The DPN Performance Viewer always provides a graphic display, whether or not output is simultaneously recorded in a specified file.

    — Although users can view it in text form, a file 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.

- Use **View Log File** to view an ASCII file in a text window. The last known log file name is used as a default file name, which the user 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 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 View the file by clicking **Show**. The **Pause** button freezes output to the xtail session until toggled off.

- Use **Exit** to close the DPN Performance Viewer. All windows associated with the session close except for any xtail sessions started using the **View Log File** command.

Options menu

Use the **Options** menu commands to customize the DPN Performance Viewer session.

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

  For a changed refresh interval, the DPN Performance Viewer remaps the metric history based on the new refresh interval. For a larger refresh interval, the older graph history appears squeezed; for 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.

- Use the **Reset History Graph** command to 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 is available:

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

  — **Reset History Graph Off** retains the current position of the graph whenever another component is selected 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:

- **What's This?** provides help information about an object in the window. Contains help information on a specific object in the window. When selected, the cursor changes to a question mark. Place the cursor anywhere on the window and click; the online help window opens with information on that feature. when no particular object is selected, general help for the application opens.

- **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. 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 scroll bar at the bottom of the graph to scroll through the complete history of the current DPN Performance Viewer session. 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. Use the left and right arrow keys to move the History Line in increments of one data point.

Metric list area

Use the Metric List Area to 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 126).

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:

- "Performance Viewer Setup dialog" (page 113)
- "PV Log File Name Entry dialog" (page 116)
- "Warning and error dialogs" (page 117)

Some DPN Performance Viewer dialogs have default action buttons. They are visually distinguished by an extra box around them. Press the Return key anywhere in the dialog to activate the default button.

Performance Viewer Setup dialog

Use the **Performance Viewer Setup** dialog to specify the performance information to display. This dialog appears on starting the DPN Performance Viewer for the first time, or when changing components or 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. Use the slide 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 selecting a DPN display, 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.

- Performance information type and component ID fields. The left side of the dialog shows performance information types, selectable by radio button (**Micro Status**, **Net Link Status**, **Trunk Status**, **Gateway Status**, and **Summary Status**). Select one type of performance information to display at a time.

  The component ID field (**Module** or **Dest Mem**) becomes active for a selected performance information type.

  Enter the component ID or 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 301).

- Use **Reauthenticate with CM** to reauthenticate with the Connection Manager. This is useful when changing different components to different user privileges.

- Use **OK** to start the DPN Performance Viewer. 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.

Use the **Performance Viewer Setup** dialog 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 301).

- **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 302).

- **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 303).

- **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 304).

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

    See "Summary status" (page 305).

PV Log File Name Entry dialog

The **PV Log File Name Entry** dialog requests a file name. The name entered into 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. Change this name if necessary. Click **Start Log** to begin collection into the log file.

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:

- Use **Log Entire History from Beginning** to write all performance metrics to the named file from the moment the DPN Performance Viewer is first started. The default value is Off.

    When set to Off, the DPN Performance Viewer records metrics from the next refresh to the point a which a user stops log collection through the **File** -> **Stop Log** 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:

- Use **Show** to refresh the contents of the dialog with the current content of the specified alarm file.

- Use **Pause** to temporarily suspend display of incoming alarms. When the display is paused, a red border surrounds the alarm information and the label on the button changes to Resume. Click Resume to removes the red border and resume display of incoming alarms.

- Use **Close** to close the dialog.

Warning and error dialogs

If any of the following warning or error dialogs appear, 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 error occurs when the specified ASCII log file can be written to (for example, the current user does 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. 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. Choose **Stop log**; the DPN Performance Viewer closes the log file and unlocks it.

If the file is not in use, it may be incorrectly marked as locked. Delete a file called "<filename>.lock" located in the same directory as <filename>, probably in the home directory.

PV File Exists Warning dialog

The file in which to record the DPN Performance Viewer log already exists. Existing data in that file is lost. To keep the existing file, click **No, keep the file**, select **Log to File**, and specify a different file name.

- Click **Yes** to delete the file and start a new log and overwrites the existing file.

- Click **No** to keep the file and cancel 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 certain the component is supported, ensure that the component name is in correct syntax and try again using the **Change Parameters** option. If the condition persists, see the system administrator.

PV IPC Error dialog

The DPN Performance Viewer fails to establish a connection to the inter-process communication server. 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 the 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 the 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, the user requires specific security parameters. These parameters are provided when the **CM** window is open and requests group, ID, and password entries.

This window may pop up when a component is changed (probably the same component tried) and the **Reauthenticate with CM** button is selected 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. Try again using the **Change Parameters** option. If the situation persists, see the 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. Try again using the **Change Parameters** option. If the situation persists, see the 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 the system configuration for connection between Preside Multiservice Data Manager 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 the user completes a manual component restart using the **Change Parameters option.**

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 the system administrator.

Accumulator IPC Error

An attempt to connect to the server GMDR fails. Make sure the server GMDR
is running on the local workstation or the workstation the 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 the 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
to the OA or from the OA to the reporting module is up. Try again using the
Change Parameters option. If the persists, see the 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

Perform the following tasks with DPN Performance Viewer:

- "Starting the DPN Performance Viewer" (page 120)

- "Displaying component information" (page 121)

Starting the DPN Performance Viewer

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, but does
> allow more precise identification of an OA. 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 application main window, select **Performance** ->**DPN Performance Viewer**.

The **Performance Viewer Setup** window opens.
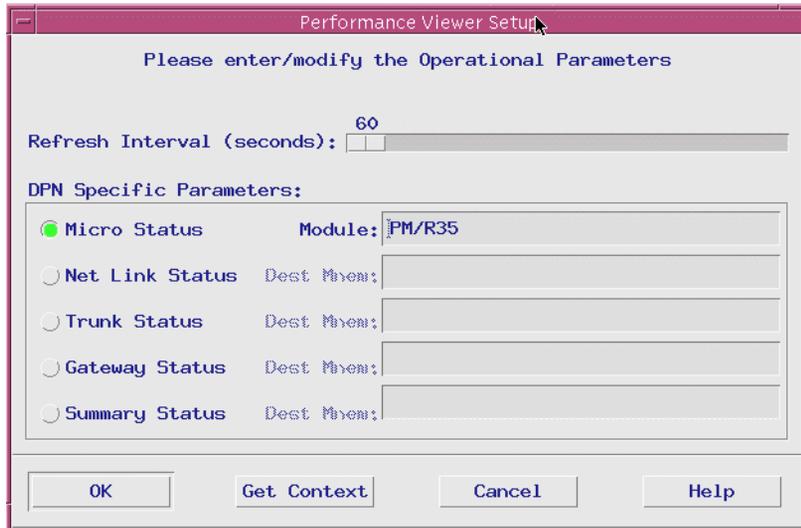
2   To display performance information, choose one of the following:

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

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

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

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

    e.   For a DPN summary status display, click **Summary Status**, and enter the reporting Dest Mnem 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 (selected 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. Define 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. 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.
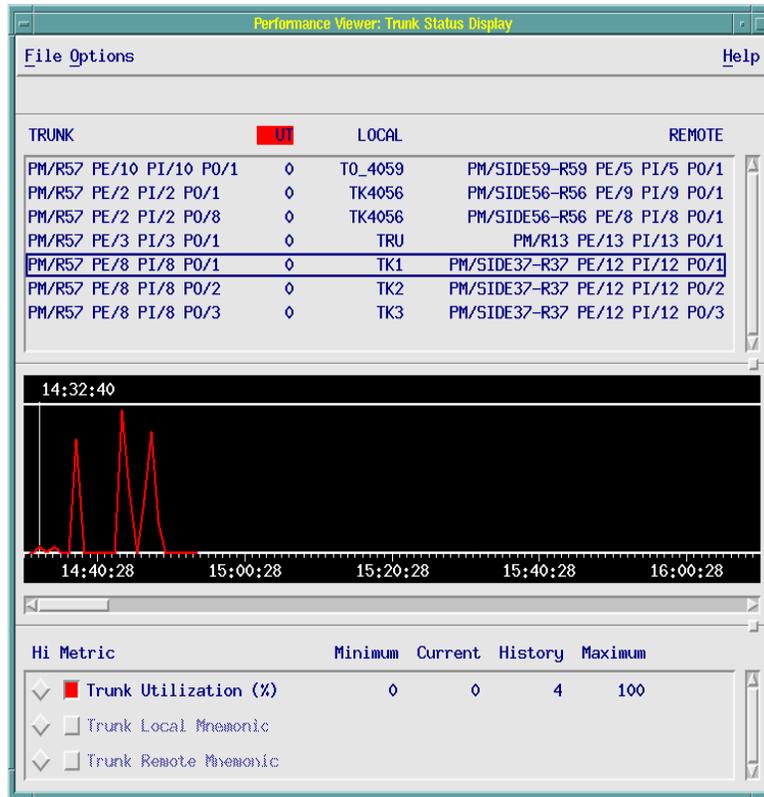
This sample screen graphs the **Trunk Utilization** performance of DPN components under a Dest Mnem. The Performance Viewer used a refresh interval of 60 seconds and ran for about thirty minutes.

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. Select the metrics 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 contents. Display graphs of CPU Utilization (%)and Msg Block Utilization (%) for card components. For trunk components, display Packets/sec from interface, Trunk Pks/sec from interface, Discarded Packets/sec, and Round trip delay/ms. For bus components, 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** selected 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. 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: The **History Line** cannot move to a point before the Performance Viewer start date and time or to a point beyond the current value.

3 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   To change the nature of the DPN Performance Viewer display, use the **Options** menu. Change parameters to view the performance of another component after entering the component ID in the **Performance Viewer Setup** dialog. If necessary, 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. When the refresh interval is changed, new history points line up based on the new refresh interval. This change 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 for a name for the log file to create, 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 the selected filename is 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 on view. 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 contents. 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** defined 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 124).

Customizing DPN Performance Viewer default settings

To override the default settings, enter new values in the .Xdefaults file in the $HOME/MagellanNMS directory as shown in the table "Resources for customizing Performance Viewer default settings" (page 126).

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. Choose any value between 200 and 10 000.
PV*logFile	Is used to enter a default log filename whenever using the Start Log… option under the File menu.	Choose any valid UNIX absolute path file.
(Sheet 1 of 2)		

Table 1 (Continued)
Resources for customizing Performance Viewer default settings

Resource	Description	Legal values
PV*refreshInterval	Sets the refresh frequency default.	The default value is 300 seconds; however, 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.
(Sheet 2 of 2)		

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

Understanding DPN Performance Viewer log files

The information collected by DPN Performance Viewer can be written to a log file. 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 124).

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 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. Do not 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: 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.
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.

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.
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.

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.
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.
(Sheet 1 of 4)		

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

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

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

Name	Formula		Meaning
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.
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.
(Sheet 3 of 4)			

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

Name	Formula	Meaning
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.
(Sheet 1 of 4)		

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

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

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

Name	Formula		Meaning
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.
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.
(Sheet 3 of 4)			

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

Name	Formula	Meaning
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 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.
(Sheet 1 of 4)		

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

Name	Formula	Meaning
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.
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.

(Sheet 2 of 4)

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

Name	Formula		Meaning
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.
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.
(Sheet 3 of 4)			

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

Name	Formula	Meaning
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 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.
(Sheet 1 of 4)		

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

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

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

Name	Formula		Meaning
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.
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.
(Sheet 3 of 4)			

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

Name	Formula	Meaning
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 9
Component: EM/ ATMMPE/ AC/

Name	Formula		Meaning
In Packets/sec	(inPackets/NUM) SECONDS	DELTA 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) SECONDS	DELTA 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) SECONDS	DELTA DIVIDE	Counts the total number of packets received on the connection which contained errors preventing them from being delivered to a higher-layer protocol.
(Sheet 1 of 2)			

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.
(Sheet 2 of 2)		

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.
Frames per second Received	(frmFromIf/NUM) SECONDS	DELTA 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.
(Sheet 1 of 2)			

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

Name	Formula	Meaning
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.
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.
(Sheet 2 of 2)		

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.
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 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.
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 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.
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 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.
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.

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.
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 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.
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.
(Sheet 1 of 8)			

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

Name	Formula	Meaning
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.
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.
(Sheet 2 of 8)		

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

Name	Formula	Meaning
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.
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.
(Sheet 3 of 8)		

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

Name	Formula	Meaning
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.
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.
(Sheet 4 of 8)		

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

Name	Formula	Meaning
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.
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.
(Sheet 5 of 8)		

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

Name	Formula	Meaning
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.
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.
(Sheet 6 of 8)		

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

Name	Formula	Meaning
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.
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.
(Sheet 7 of 8)		

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

Name	Formula	Meaning
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.
(Sheet 8 of 8)		

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.
(Sheet 1 of 2)				

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.
(Sheet 2 of 2)			

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.
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.
(Sheet 1 of 2)		

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

Name	Formula	Meaning
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.
(Sheet 2 of 2)		

Table 23
Component: EM/ FRDTE/ FRAMER

Name	Formula		Meaning
Frames per second Sent	(frmToIf/NUM) SECONDS	DELTA 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) SECONDS	DELTA 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.
(Sheet 1 of 2)		

Table 25 (Continued)
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.
(Sheet 2 of 2)		

Table 26
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.
(Sheet 1 of 5)		

Table 26 (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.

(Sheet 2 of 5)

Table 26 (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.
(Sheet 3 of 5)		

Table 26 (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.

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Table 26 (Continued)
Component: EM/ FRNNI/ DLCI/

Name	Formula	Meaning
BECN Frames Received	(becnFrmFromIf/NUM) DELTA	Frames received with BECN bit set.
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.
(Sheet 5 of 5)		

Table 27
Component: EM/ FRNNI/ FRAMER

Name	Formula			Meaning
Frames per second Sent	(frmToIf/NUM)	DELTA		Frames sent per second.
	SECONDS		DIVIDE	
Frames Sent since Baseline	(frmToIf/NUM) BASELINEDELTA			Frames sent since the last baseline reset.
Frames per second Received	(frmFromIf/NUM)	DELTA		Frames received per second.
	SECONDS		DIVIDE	
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 28
Component: 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.
(Sheet 1 of 2)		

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.
(Sheet 2 of 2)		

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.
(Sheet 1 of 5)		

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.
(Sheet 2 of 5)		

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.
(Sheet 3 of 5)		

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.
(Sheet 4 of 5)		

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

Name	Formula	Meaning
BECN Frames Received	(becnFrmFromIf/NUM) DELTA	Frames received with BECN bit set.
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.
(Sheet 5 of 5)		

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.
(Sheet 1 of 3)			

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

Name	Formula		Meaning
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.
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.
(Sheet 2 of 3)			

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

Name	Formula	Meaning
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.
(Sheet 3 of 3)		

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/ LA/ FRAMER

Name	Formula		Meaning
Bytes Received	(rxBytes/NUM)	DELTA	The total number of bytes received since the last probe.
Bytes Received since Baseline	(rxBytes/NUM) BASELINEDELTA		The total number of bytes received since the last baseline reset.
Frames Received	(rxFrames/NUM)	DELTA	The total number of frames received since the last probe.
(Sheet 1 of 3)			

Table 37 (Continued)
Component: EM/ LA/ FRAMER

Name	Formula		Meaning
Frames Received since Baseline	(rxFrames/NUM) BASELINEDELTA		The total number of frames received since the last baseline reset.
Bytes Transmitted	(txBytes/NUM)	DELTA	The total number of bytes transmitted since the last probe.
Bytes Transmitted since Baseline	(txBytes/NUM) BASELINEDELTA		The total number of bytes transmitted since the last baseline reset.
Frames Transmitted	(txFrames/NUM)	DELTA	The total number of frames transmitted since the last probe.
Frames Transmitted since Baseline	(txFrames/NUM) BASELINEDELTA		The total number of frames transmitted since the last baseline reset.
Frames Transmit Discards	(txDiscard/NUM)	DELTA	The total number of frames transmitted that are discarded since the last probe.
Frames Transmit Discards since Baseline	(txDiscard/NUM) BASELINEDELTA		The total number of frames transmitted that are discarded since the last baseline reset.
Frames Receive Discards	(rxDiscard/NUM)	DELTA	The total number of frames received that are discarded since the last probe.
Frames Receive Discards since Baseline	(rxDiscard/NUM) BASELINEDELTA		The total number of frames received that are discarded since the last baseline reset.
(Sheet 2 of 3)			

Table 37 (Continued)
Component: EM/ LA/ FRAMER

Name	Formula	Meaning
Frames Receive Errors	(rxFrameError/NUM) DELTA	The total number of frames received that are discarded due to frame error since the last probe.
Frames Receive Errors since Baseline	(rxFrameError/NUM) BASELINEDELTA	The total number of frames received that are discarded due to frame error since the last baseline reset.
(Sheet 3 of 3)		

Table 38
Component: EM/ LA/ STATS

Name	Formula	Meaning
Bytes Received	(rxBytes/NUM) DELTA	The total number of bytes received since the last probe.
Bytes Received since Baseline	(rxBytes/NUM) BASELINEDELTA	The total number of bytes received since the last baseline reset.
Received Frames Discarded	(rxDiscFrames/NUM) DELTA (rxDiscNetCong/ NUM) DELTA ADD	The total number of frames received that were discarded since the last probe.
Received Frames Discarded since Baseline	(rxDiscFrames/NUM) BASELINEDELTA (rxDiscNetCong/NUM) BASELINEDELTA ADD	The total number of frames received that were discarded since the last baseline reset.
Frames Received	(rxFrames/NUM) DELTA	The total number of frames received since the last probe.
Frames Received since Baseline	(rxFrames/NUM) BASELINEDELTA	The total number of frames received since the last baseline reset.
Bytes Transmitted	(txBytes/NUM) DELTA	The total number of bytes transmitted since the last probe.
Bytes Transmitted since Baseline	(txBytes/NUM) BASELINEDELTA	The total number of bytes transmitted since the last baseline reset.
Transmitted Frames Discarded	(txDiscFrames/NUM) DELTA (txDiscIfCong/ NUM) DELTA ADD	The total number of frames transmitted that were discarded since the last probe.
Transmitted Frames Discarded since Baseline	(txDiscFrames/NUM) BASELINEDELTA (txDiscIfCong/NUM) BASELINEDELTA ADD	The total number of frames transmitted that were discarded since the last baseline reset.
(Sheet 1 of 2)		

Table 38 (Continued)
Component: EM/ LA/ STATS

Name	Formula		Meaning
Frames Transmitted	(txFrames/NUM)	DELTA	The total number of frames transmitted since the last probe.
Frames Transmitted since Baseline	(txFrames/NUM) BASELINEDELTA		The total number of frames transmitted since the last baseline reset.
(Sheet 2 of 2)			

Table 39
Component: EM/ LA/ VLAN/ STATS

Name	Formula	Meaning
Bytes Received	(rxBytes/NUM) DELTA	The total number of bytes received since the last probe.
Bytes Received since Baseline	(rxBytes/NUM) BASELINEDELTA	The total number of bytes received since the last baseline reset.
Received Frames Discarded	(rxDiscFrames/NUM) DELTA (rxDiscNetCong/ NUM) DELTA ADD	The total number of frames received that were discarded since the last probe.
Received Frames Discarded since Baseline	(rxDiscFrames/NUM) BASELINEDELTA (rxDiscNetCong/NUM) BASELINEDELTA ADD	The total number of frames received that were discarded since the last baseline reset.
Frames Received	(rxFrames/NUM) DELTA	The total number of frames received since the last probe.
Frames Received since Baseline	(rxFrames/NUM) BASELINEDELTA	The total number of frames received since the last baseline reset.
Bytes Transmitted	(txBytes/NUM) DELTA	The total number of bytes transmitted since the last probe.
Bytes Transmitted since Baseline	(txBytes/NUM) BASELINEDELTA	The total number of bytes transmitted since the last baseline reset.
Transmitted Frames Discarded	(txDiscFrames/NUM) DELTA (txDiscIfCong/ NUM) DELTA ADD	The total number of frames transmitted that were discarded since the last probe.
Transmitted Frames Discarded since Baseline	(txDiscFrames/NUM) BASELINEDELTA (txDiscIfCong/NUM) BASELINEDELTA ADD	The total number of frames transmitted that were discarded since the last baseline reset.
(Sheet 1 of 2)		

Table 39 (Continued)
Component: EM/ LA/ VLAN/ STATS

Name	Formula		Meaning
Frames Transmitted	(txFrames/NUM)	DELTA	The total number of frames transmitted since the last probe.
Frames Transmitted since Baseline	(txFrames/NUM) BASELINEDELTA		The total number of frames transmitted since the last baseline reset.
(Sheet 2 of 2)			

Table 40
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.
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 41
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.
(Sheet 1 of 2)		

Table 41 (Continued)
Component: EM/ LP/ ARU/

Name	Formula	Meaning
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.
(Sheet 2 of 2)		

Table 42
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.
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 43
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 44
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.
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 45
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.
(Sheet 1 of 2)		

Table 45 (Continued)
Component: EM/ LP/ DS3/ CBIT

Name	Formula	Meaning
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.
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 46
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 47
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 48
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.
(Sheet 1 of 2)			

Table 48 (Continued)
Component: EM/ LP/ E1/

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.
(Sheet 2 of 2)			

Table 49
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 50
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 51
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 52
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.
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.
(Sheet 1 of 3)			

Table 52 (Continued)
Component: EM/ LP/ ENET/

Name	Formula	Meaning
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.
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.

(Sheet 2 of 3)

Table 52 (Continued)
Component: EM/ LP/ ENET/

Name	Formula	Meaning
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.
(Sheet 3 of 3)		

Table 53
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.
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.

Table 54
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 55
Component: EM/ LP/ ETH/

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.
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.
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.
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.
(Sheet 1 of 3)		

Table 55 (Continued)
Component: EM/ LP/ ETH/

Name	Formula	Meaning
Carrier Sense Errors since Baseline	(carrierSenseErrors/NUM) BASELINEDELTA	Number of carrier sense 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.
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.
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.
(Sheet 2 of 3)		

Table 55 (Continued)
Component: EM/ LP/ ETH/

Name	Formula		Meaning
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.
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 56
Component: EM/ LP/ ETH100/

Name	Formula	Meaning
Alignment Errors	(alignmentErrors/NUM) DELTA	Alignment Errors.
Alignment Errors since Baseline	(alignmentErrors/NUM) BASELINEDELTA	Alignment Errors since last baseline reset.
Carrier Sense Errors	(carrierSenseErrors/NUM) DELTA	Carrier Sense Errors.
Carrier Sense Errors since Baseline	(carrierSenseErrors/NUM) BASELINEDELTA	Carrier Sense Errors since last baseline reset.
Deferred Transmissions	(deferredTransmissions/NUM) DELTA	Deferred Transmissions.
Deferred Transmissions since Baseline	(deferredTransmissions/NUM) BASELINEDELTA	Deferred Transmissions since last baseline reset.
Excessive Collisions	(excessiveCollisions/NUM) DELTA	Excessive Collisions.
Excessive Collisions since Baseline	(excessiveCollisions/NUM) BASELINEDELTA	Excessive Collisions since last baseline reset.
FCS Errors	(fcsErrors/NUM) DELTA	FCS Errors.
FCS Errors since Baseline	(fcsErrors/NUM) BASELINEDELTA	FCS Errors since last baseline reset.
Frames Too Long	(frameTooLongs/NUM) DELTA	Frames Too Long.
Frames Too Long since Baseline	(frameTooLongs/NUM) BASELINEDELTA	Frames Too Long since last baseline reset.
Frames Received Ok	(framesReceivedOk/NUM) DELTA	Frames Received Ok.
Frames Received Ok since Baseline	(framesReceivedOk/NUM) BASELINEDELTA	Frames Received Ok since last baseline reset.
Frames Transmitted Ok	(framesTransmittedOk/NUM) DELTA	Frames Transmitted Ok.

(Sheet 1 of 3)

Table 56 (Continued)
Component: EM/ LP/ ETH100/

Name	Formula	Meaning
Frames Transmitted Ok since Baseline	(framesTransmittedOk/NUM) BASELINEDELTA	Frames Transmitted Ok since last baseline reset.
Late Collisions	(lateCollisions/NUM) DELTA	Late Collisions.
Late Collisions since Baseline	(lateCollisions/NUM) BASELINEDELTA	Late Collisions since last baseline reset.
Mac Receive Errors	(macReceiveErrors/NUM) DELTA	Mac Receive Errors.
Mac Receive Errors since Baseline	(macReceiveErrors/NUM) BASELINEDELTA	Mac Receive Errors since last baseline reset.
Mac Transmit Errors	(macTransmitErrors/NUM) DELTA	Mac Transmit Errors.
Mac Transmit Errors since Baseline	(macTransmitErrors/NUM) BASELINEDELTA	Mac Transmit Errors since last baseline reset.
Multiple Collision Frames	(multipleCollisionFrames/NUM) DELTA	Multiple Collision Frames.
Multiple Collision Frames since Baseline	(multipleCollisionFrames/NUM) BASELINEDELTA	Multiple Collision Frames since last baseline reset.
Octets Received Ok	(octetsReceivedOk/NUM) DELTA	Octets Received Ok.
Octets Received Ok since Baseline	(octetsReceivedOk/NUM) BASELINEDELTA	Octets Received Ok since last baseline reset.
Octets Transmitted Ok	(octetsTransmittedOk/NUM) DELTA	Octets Transmitted Ok.
Octets Transmitted Ok since Baseline	(octetsTransmittedOk/NUM) BASELINEDELTA	Octets Transmitted Ok since last baseline reset.
Received Frames Into Router Br	(receivedFramesIntoRouterBr/ NUM) DELTA	Received Frames Into Router Br.
Received Frames Into Router Br since Baseline	(receivedFramesIntoRouterBr/ NUM) BASELINEDELTA	Received Frames Into Router Br since last baseline reset.
(Sheet 2 of 3)		

Table 56 (Continued)
Component: EM/ LP/ ETH100/

Name	Formula	Meaning
Received Octets Into Router Br	(receivedOctetsIntoRouterBr/NUM) DELTA	Received Octets Into Router Br.
Received Octets Into Router Br since Baseline	(receivedOctetsIntoRouterBr/NUM) BASELINEDELTA	Received Octets Into Router Br since last baseline reset.
Single Collision Frames	(singleCollisionFrames/NUM) DELTA	Single Collision Frames.
Single Collision Frames since Baseline	(singleCollisionFrames/NUM) BASELINEDELTA	Single Collision Frames since last baseline reset.
SQE Test Errors	(sqeTestErrors/NUM) DELTA	SQE Test Errors.
SQE Test Errors since Baseline	(sqeTestErrors/NUM) BASELINEDELTA	SQE Test Errors since last baseline reset.
Undersize Frames	(undersizeFrames/NUM) DELTA	Undersize Frames.
Undersize Frames since Baseline	(undersizeFrames/NUM) BASELINEDELTA	Undersize Frames since last baseline reset.
(Sheet 3 of 3)		

Table 57
Component: EM/ LP/

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 58
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 59
Component: EM/ LP/ LAG/

Name	Formula		Meaning
Failures	(failures/NUM)	DELTA	This attribute counts the complete failures.
Received Frame Octets	(rxFrameOctets/NUM) DELTA		This attribute counts the valid user frames, in octets, received on the .
Transmitted Frame Octets	(txFrameOctets/NUM) DELTA		This attribute counts the valid packets transmitted on the .
Received Frame Packets	(rxFramePackets/NUM) DELTA		This attribute counts the valid packets received on the .
Transmitted Frame Packets	(txFramePackets/NUM) DELTA		This attribute indicates the total number of valid packets transmitted on the .
Received Frame Discards	(rxFrameDiscards/NUM) DELTA		This attribute counts the discarded user frames after they were received on the .
Transmitted Frame Discards	(txFrameDiscards/NUM) DELTA		This attribute counts the discarded user frames during transmission on the .
Received Frame Errors	(rxFrameErrors/NUM) DELTA		This attribute counts the invalid user frames received on the .
Transmitted Frame Errors	(txFrameErrors/NUM) DELTA		This attribute counts the invalid user frames transmitted on the .
Failures since Baseline	(failures/NUM) BASELINEDELTA		This attribute counts the complete failures since last baseline reset.
Received Frame Octets since Baseline	(rxFrameOctets/NUM) BASELINEDELTA		This attribute counts the valid user frames, in octets, received on the since last baseline reset.
(Sheet 1 of 2)			

Table 59 (Continued)
Component: EM/ LP/ LAG/

Name	Formula	Meaning
Transmitted Frame Octets since Baseline	(txFrameOctets/NUM) BASELINEDELTA	This attribute counts the valid packets transmitted on the since last baseline reset.
Received Frame Packets since Baseline	(rxFramePackets/NUM) BASELINEDELTA	This attribute counts the valid packets received on the since last baseline reset.
Transmitted Frame Packets since Baseline	(txFramePackets/NUM) BASELINEDELTA	This attribute indicates the total number of valid packets transmitted on the since last baseline reset.
Received Frame Discards since Baseline	(rxFrameDiscards/NUM) BASELINEDELTA	This attribute counts the discarded user frames after they were received on the since last baseline reset.
Transmitted Frame Discards since Baseline	(txFrameDiscards/NUM) BASELINEDELTA	This attribute counts the discarded user frames during transmission on the since last baseline reset.
Received Frame Errors since Baseline	(rxFrameErrors/NUM) BASELINEDELTA	This attribute counts the invalid user frames received on the since last baseline reset.
Transmitted Frame Errors since Baseline	(txFrameErrors/NUM) BASELINEDELTA	This attribute counts the invalid user frames transmitted on the since last baseline reset.
(Sheet 2 of 2)		

Table 60
Component: EM/ LP/ LAG/ LK/

Name	Formula		Meaning
Failures	(failures/NUM)	DELTA	This attribute counts the complete failures.
Received LACP	(rxLacp/NUM)	DELTA	This attribute counts LACP frames received from the remote end system.
Transmitted LACP	(txLacp/NUM)	DELTA	This attribute counts the LACP frames transmitted from the near end system.
Received Invalid LACP	(rxInvalidLacp/NUM) DELTA		This attribute counts the invalid LACP frames received from the remote end system.
Received Marker	(rxMarker/NUM)	DELTA	This attribute counts the Marker frames received from the remote end system.
Transmitted Marker	(txMarker/NUM)	DELTA	This attribute counts the Marker frames transmitted from the near end system.
Received Invalid Marker	(rxInvalidMarker/NUM) DELTA		This attribute counts the invalid Marker frames received from the remote end system.
Failures since Baseline	(failures/NUM) BASELINE	DELTA	This attribute counts the complete failures since last baseline reset.
Received LACP since Baseline	(rxLacp/NUM) BASELINEDELTA		This attribute counts LACP frames received from the remote end system since last baseline reset.
Transmitted LACP since Baseline	(txLacp/NUM) BASELINEDELTA		This attribute counts the LACP frames transmitted from the near end system since last baseline reset.
(Sheet 1 of 2)			

Table 60 (Continued)
Component: EM/ LP/ LAG/ LK/

Name	Formula	Meaning
Received Invalid LACP since Baseline	(rxInvalidLacp/NUM) BASELINEDELTA	This attribute counts the invalid LACP frames received from the remote end system since last baseline reset.
Received Marker since Baseline	(rxMarker/NUM) BASELINEDELTA	This attribute counts the Marker frames received from the remote end system since last baseline reset.
Transmitted Marker since Baseline	(txMarker/NUM) BASELINEDELTA	This attribute counts the Marker frames transmitted from the near end system since last baseline reset.
Received Invalid Marker since Baseline	(rxInvalidMarker/NUM) BASELINEDELTA	This attribute counts the invalid Marker frames received from the remote end system since last baseline reset.
(Sheet 2 of 2)		

Table 61
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.
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.
(Sheet 1 of 3)		

Table 61 (Continued)
Component: EM/ LP/ SDH/

Name	Formula	Meaning
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.
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.

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Table 61 (Continued)
Component: EM/ LP/ SDH/

Name	Formula	Meaning
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 62
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.
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.
(Sheet 1 of 2)		

Table 62 (Continued)
Component: EM/ LP/ SDH/ 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.
(Sheet 2 of 2)		

Table 63
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 64
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.
(Sheet 1 of 3)		

Table 64 (Continued)
Component: EM/ LP/ SONET/

Name	Formula	Meaning
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.
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.

(Sheet 2 of 3)

Table 64 (Continued)
Component: EM/ LP/ SONET/

Name	Formula	Meaning
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.
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.
(Sheet 3 of 3)		

Table 65
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.
(Sheet 1 of 2)		

Table 65 (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.
(Sheet 2 of 2)		

Table 66
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 67
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.
Kilobytes per second Sent	(octetToIf/NUM) SECONDS 1000	DELTA DIVIDE DIVIDE	Number of kilobytes sent per second since last probe.
Kilobytes Sent since Baseline	(octetToIf/NUM) BASELINEDELTA DIVIDE	1000	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.
(Sheet 1 of 2)			

Table 67 (Continued)
Component: EM/ MPANL/

Name	Formula	Meaning
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.
(Sheet 2 of 2)		

Table 68
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 69
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 70
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 71
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.
(Sheet 1 of 2)		

Table 71 (Continued)
Component: EM/ PPP/ FRAMER

Name	Formula		Meaning
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.
(Sheet 2 of 2)			

Table 72
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.
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.
(Sheet 1 of 4)		

Table 72 (Continued)
Component: EM/ RTR/

Name	Formula	Meaning
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.
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.

(Sheet 2 of 4)

Table 72 (Continued)
Component: EM/ RTR/

Name	Formula	Meaning
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.
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.
(Sheet 3 of 4)		

Table 72 (Continued)
Component: EM/ RTR/

Name	Formula	Meaning
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.
(Sheet 4 of 4)		

Table 73
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.
(Sheet 1 of 4)			

Table 73 (Continued)
Component: EM/ RTR/ IF/

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

Table 73 (Continued)
Component: EM/ RTR/ IF/

Name	Formula	Meaning
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.
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.
(Sheet 3 of 4)		

Table 73 (Continued)
Component: EM/ RTR/ IF/

Name	Formula	Meaning
In NUcast Pkts since Baseline	(ifInNuCastPkts/NUM) BASELINEDELTA	Number of non-unicast packets delivered to a higher layer protocol, since the last baseline reset.
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.
(Sheet 4 of 4)		

Table 74
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.
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.
(Sheet 1 of 2)			

Table 74 (Continued)
Component: EM/ RTR/ IF/ LDPIF

Name	Formula	Meaning
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.
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.
(Sheet 2 of 2)		

Table 75
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.
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.
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Table 75 (Continued)
Component: EM/ RTR/ VRF/

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

Table 75 (Continued)
Component: EM/ RTR/ VRF/

Name	Formula	Meaning
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.
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.

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Table 75 (Continued)
Component: EM/ RTR/ VRF/

Name	Formula	Meaning
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.
(Sheet 4 of 4)		

Table 76
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.
(Sheet 1 of 4)			

Table 76 (Continued)
Component: EM/ RTR/ VRF/ IF/

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

Table 76 (Continued)
Component: EM/ RTR/ VRF/ IF/

Name	Formula	Meaning
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.
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.
(Sheet 3 of 4)		

Table 76 (Continued)
Component: EM/ RTR/ VRF/ IF/

Name	Formula	Meaning
In NUcast Pkts since Baseline	(ifInNuCastPkts/NUM) BASELINEDELTA	Number of non-unicast packets delivered to a higher layer protocol, since the last baseline reset.
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.
(Sheet 4 of 4)		

Table 77
Component: EM/ RTR/ VRF/ IF/ ATMMPE AC/

Name	Formula		Meaning
In Packets/sec	(inPackets/NUM) SECONDS	DELTA 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) SECONDS	DELTA 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) SECONDS	DELTA DIVIDE	Counts the total number of packets received on the connection which contained errors preventing them from being delivered to a higher-layer protocol.
(Sheet 1 of 2)			

Table 77 (Continued)
Component: EM/ RTR/ VRF/ IF/ 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.
(Sheet 2 of 2)		

Table 78
Component: EM/ RTR/ VRF/ IF/ ES METER/

Name	Formula	Meaning
Packets Received	(packetsReceived/NUM) DELTA	This attribute counts the number of packets received on an interface
Octets Received	(octetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface
EIR Packets Received	(eirPacketsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
EIR Octets Received	(eirOctetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
Packets Remarked	(packetsRemarked/NUM) DELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Octets Remarked	(octetsRemarked/NUM) DELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Packets Discarded	(packetsDiscarded/NUM) DELTA	This attribute counts the number of packets discarded by this traffic policer.
Octets Discarded	(octetsDiscarded/NUM) DELTA	This attribute counts the number of octets discarded by this traffic policer.
(Sheet 1 of 3)		

Table 78 (Continued)
Component: EM/ RTR/ VRF/ IF/ ES METER/

Name	Formula	Meaning
Committed Information Rate	(committedInformationRate/NUM)	This attribute indicates the Committed Information Rate (cir) in bits per second.
Excess Information Rate	(excessInformationRate/NUM)	This attribute indicates the Excess Information Rate (eir) in bits per second.
Committed Burst Size	(committedBurstSize/NUM)	This attribute specifies the committed burst size (bc) in bits.
Excess Burst Size	(excessBurstSize/NUM)	This attribute specifies the excess burst size (be) in bits.
Measurment Interval	(measurmentInterval/NUM)	This attribute specifies the time interval (in milliseconds) over which rates and burst sizes are measured.
Packets Received since Baseline	(packetsReceived/NUM) BASELINEDELTA	This attribute counts the number of packets received on an interface since last baseline reset
Octets Received since Baseline	(octetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface since last baseline reset
EIR Packets Received since Baseline	(eirPacketsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
(Sheet 2 of 3)		

Table 78 (Continued)
Component: EM/ RTR/ VRF/ IF/ ES METER/

Name	Formula	Meaning
EIR Octets Received since Baseline since Baseline	(eirOctetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
Packets Remarked since Baseline	(packetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Octets Remarked since Baseline	(octetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Packets Discarded since Baseline	(packetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of packets discarded by this traffic policer since last baseline reset
Octets Discarded since Baseline	(octetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of octets discarded by this traffic policer since last baseline reset
(Sheet 3 of 3)		

Table 79
Component: EM/ RTR/ VRF/ IF/ IS METER/

Name	Formula	Meaning
Packets Received	(packetsReceived/NUM) DELTA	This attribute counts the number of packets received on an interface
Octets Received	(octetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface
EIR Packets Received	(eirPacketsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
EIR Octets Received	(eirOctetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
Packets Remarked	(packetsRemarked/NUM) DELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Octets Remarked	(octetsRemarked/NUM) DELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Packets Discarded	(packetsDiscarded/NUM) DELTA	This attribute counts the number of packets discarded by this traffic policer.
Octets Discarded	(octetsDiscarded/NUM) DELTA	This attribute counts the number of octets discarded by this traffic policer.
(Sheet 1 of 3)		

Table 79 (Continued)
Component: EM/ RTR/ VRF/ IF/ IS METER/

Name	Formula	Meaning
Committed Information Rate	(committedInformationRate/NUM)	This attribute indicates the Committed Information Rate (cir) in bits per second.
Excess Information Rate	(excessInformationRate/NUM)	This attribute indicates the Excess Information Rate (eir) in bits per second.
Committed Burst Size	(committedBurstSize/NUM)	This attribute specifies the committed burst size (bc) in bits.
Excess Burst Size	(excessBurstSize/NUM)	This attribute specifies the excess burst size (be) in bits.
Measurment Interval	(measurmentInterval/NUM)	This attribute specifies the time interval (in milliseconds) over which rates and burst sizes are measured.
Packets Received since Baseline	(packetsReceived/NUM) BASELINEDELTA	This attribute counts the number of packets received on an interface since last baseline reset
Octets Received since Baseline	(octetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface since last baseline reset
EIR Packets Received since Baseline	(eirPacketsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
(Sheet 2 of 3)		

Table 79 (Continued)
Component: EM/ RTR/ VRF/ IF/ IS METER/

Name	Formula	Meaning
EIR Octets Received since Baseline since Baseline	(eirOctetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
Packets Remarked since Baseline	(packetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Octets Remarked since Baseline	(octetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Packets Discarded since Baseline	(packetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of packets discarded by this traffic policer since last baseline reset
Octets Discarded since Baseline	(octetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of octets discarded by this traffic policer since last baseline reset
(Sheet 3 of 3)		

Table 80
Component: EM/ SHELF BUS/

Name	Formula	Meaning
Bus Utilization (%)	(utilization/NUM)	Bus utilization.

Table 81
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.
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.

Table 82
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.
(Sheet 1 of 2)		

Table 82 (Continued)
Component: EM/ SHELF CARD/

Name	Formula	Meaning
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.
(Sheet 2 of 2)		

Table 83
Component: EM/ SHELF FABRICCARD/

Name	Formula	Meaning
Bus Utilization (%)	(utilization/NUM)	Estimates the current fabric utilization.

Table 84
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.
(Sheet 1 of 3)		

Table 84 (Continued)
Component: EM/ TRK/

Name	Formula	Meaning
Round trip delay (ms / 10)	(measuredRoundTripDelay/NUM)	Round trip delay in millisecond measured by the trunk or DPN Gateway.
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.
(Sheet 2 of 3)		

Table 84 (Continued)
Component: EM/ TRK/

Name	Formula	Meaning
Discarded Packet/sec from IF EP equals 2	(discPktFromIfByPrio[2]/NUM) DELTA SECONDS DIVIDE	Discarded packets with priority 2 from interface per second.
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.
(Sheet 3 of 3)		

Table 85
Component: EM/ TRK/ ATM

Name	Formula	Meaning
Last Calculated Vcc Utilization	(lastCalculatedVccUtilization/NUM)	Last Calculated Vcc Utilization.
Last Calculated TxVcc Utilization	(lastCalculatedTxVccUtilization/ NUM)	Last Calculated TxVcc Utilization.

Table 86
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.
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.
(Sheet 1 of 2)		

Table 86 (Continued)
Component: EM/ TRK/ UNACKED FRAMER

Name	Formula		Meaning
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.
(Sheet 2 of 2)			

Table 87
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.
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.

Table 88
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.
(Sheet 1 of 4)			

Table 88 (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.
(Sheet 2 of 4)		

Table 88 (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.

 (Sheet 3 of 4)

Table 88 (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.
(Sheet 4 of 4)		

Table 89
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.
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.
(Sheet 1 of 4)		

Table 89 (Continued)
Component: EM/ VR/ IP

Name	Formula	Meaning
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.
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.
(Sheet 2 of 4)		

Table 89 (Continued)
Component: EM/ VR/ IP

Name	Formula	Meaning
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.
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.

(Sheet 3 of 4)

Table 89 (Continued)
Component: EM/ VR/ IP

Name	Formula	Meaning
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.
(Sheet 4 of 4)		

Table 90
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 91
Component: EM/ VR/ PP/ IPPORT ES METER/

Name	Formula	Meaning
Packets Received	(packetsReceived/NUM) DELTA	This attribute counts the number of packets received on an interface
Octets Received	(octetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface
(Sheet 1 of 4)		

Table 91 (Continued)
Component: EM/ VR/ PP/ IPPORT ES METER/

Name	Formula	Meaning
EIR Packets Received	(eirPacketsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
EIR Octets Received	(eirOctetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
Packets Remarked	(packetsRemarked/NUM) DELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Octets Remarked	(octetsRemarked/NUM) DELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Packets Discarded	(packetsDiscarded/NUM) DELTA	This attribute counts the number of packets discarded by this traffic policer.
Octets Discarded	(octetsDiscarded/NUM) DELTA	This attribute counts the number of octets discarded by this traffic policer.
Committed Information Rate	(committedInformationRate/NUM)	This attribute indicates the Committed Information Rate (cir) in bits per second.
Excess Information Rate	(excessInformationRate/NUM)	This attribute indicates the Excess Information Rate (eir) in bits per second.
(Sheet 2 of 4)		

Table 91 (Continued)
Component: EM/ VR/ PP/ IPPORT ES METER/

Name	Formula	Meaning
Committed Burst Size	(committedBurstSize/NUM)	This attribute specifies the committed burst size (bc) in bits.
Excess Burst Size	(excessBurstSize/NUM)	This attribute specifies the excess burst size (be) in bits.
Measurment Interval	(measurmentInterval/NUM)	This attribute specifies the time interval (in milliseconds) over which rates and burst sizes are measured.
Packets Received since Baseline	(packetsReceived/NUM) BASELINEDELTA	This attribute counts the number of packets received on an interface since last baseline reset
Octets Received since Baseline	(octetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface since last baseline reset
EIR Packets Received since Baseline	(eirPacketsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
EIR Octets Received since Baseline since Baseline	(eirOctetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
(Sheet 3 of 4)		

Table 91 (Continued)
Component: EM/ VR/ PP/ IPPORT ES METER/

Name	Formula	Meaning
Packets Remarked since Baseline	(packetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Octets Remarked since Baseline	(octetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Packets Discarded since Baseline	(packetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of packets discarded by this traffic policer since last baseline reset
Octets Discarded since Baseline	(octetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of octets discarded by this traffic policer since last baseline reset
(Sheet 4 of 4)		

Table 92
Component: EM/ VR/ PP/ IPPORT IS METER/

Name	Formula	Meaning
Packets Received	(packetsReceived/NUM) DELTA	This attribute counts the number of packets received on an interface
Octets Received	(octetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface
EIR Packets Received	(eirPacketsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
EIR Octets Received	(eirOctetsReceived/NUM) DELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter.
Packets Remarked	(packetsRemarked/NUM) DELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Octets Remarked	(octetsRemarked/NUM) DELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter.
Packets Discarded	(packetsDiscarded/NUM) DELTA	This attribute counts the number of packets discarded by this traffic policer.
Octets Discarded	(octetsDiscarded/NUM) DELTA	This attribute counts the number of octets discarded by this traffic policer.
(Sheet 1 of 3)		

Table 92 (Continued)
Component: EM/ VR/ PP/ IPPORT IS METER/

Name	Formula	Meaning
Committed Information Rate	(committedInformationRate/NUM)	This attribute indicates the Committed Information Rate (cir) in bits per second.
Excess Information Rate	(excessInformationRate/NUM)	This attribute indicates the Excess Information Rate (eir) in bits per second.
Committed Burst Size	(committedBurstSize/NUM)	This attribute specifies the committed burst size (bc) in bits.
Excess Burst Size	(excessBurstSize/NUM)	This attribute specifies the excess burst size (be) in bits.
Measurment Interval	(measurmentInterval/NUM)	This attribute specifies the time interval (in milliseconds) over which rates and burst sizes are measured.
Packets Received since Baseline	(packetsReceived/NUM) BASELINEDELTA	This attribute counts the number of packets received on an interface since last baseline reset
Octets Received since Baseline	(octetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface since last baseline reset
EIR Packets Received since Baseline	(eirPacketsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
(Sheet 2 of 3)		

Table 92 (Continued)
Component: EM/ VR/ PP/ IPPORT IS METER/

Name	Formula	Meaning
EIR Octets Received since Baseline since Baseline	(eirOctetsReceived/NUM) BASELINEDELTA	This attribute counts the number of octets received on an interface that have only EIR rate enforced by this traffic meter since last baseline reset
Packets Remarked since Baseline	(packetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of packets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Octets Remarked since Baseline	(octetsRemarked/NUM) BASELINEDELTA	This attribute counts the number of octets that have exceeded the CIR rate and have been re-marked by this traffic meter since last baseline reset
Packets Discarded since Baseline	(packetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of packets discarded by this traffic policer since last baseline reset
Octets Discarded since Baseline	(octetsDiscarded/NUM) BASELINEDELTA	This attribute counts the number of octets discarded by this traffic policer since last baseline reset
(Sheet 3 of 3)		

Table 93
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.
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.
(Sheet 1 of 2)			

Table 93 (Continued)
Component: EM/ VR/ PP/ MPLSPORT

Name	Formula	Meaning
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.
(Sheet 2 of 2)		

Table 94
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.
(Sheet 1 of 2)			

Table 94 (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.
(Sheet 2 of 2)		

Table 95
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.
(Sheet 1 of 2)			

Table 95 (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.
(Sheet 2 of 2)		

Table 96
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.
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.

Table 97
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.
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.
(Sheet 1 of 2)			

Table 97 (Continued)
Component: EM/ VS/ FRAMER

Name	Formula		Meaning
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.
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 2 of 2)			

Table 98
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).
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.

Table 99
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 302).

Table 100
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.

Table 101
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 303).

Table 102
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 304).

Table 103
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 305).

Table 104
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:

- "SNMP metric file formats" (page 307)

- "METRICFILE" (page 307)

- "Metric file example" (page 318)

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 307). To view sample metric file formats, see "Metric file example" (page 318)

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. 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. 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. 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 Multiservice Data Manager 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. 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 using 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. 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. 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, entered 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, express new Data Viewer
metrics in a manner that runs 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).

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
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 using 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. 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
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, use the SECOND keyword to construct metrics of the form "Alarms per minute". To do so, 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, 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 entering 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
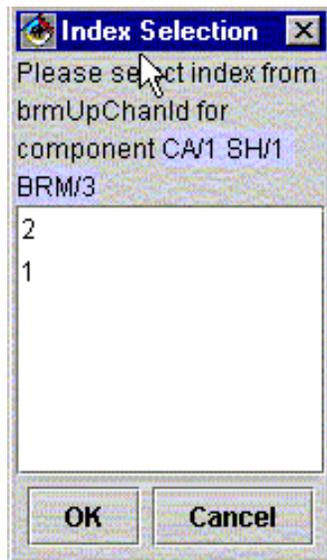componentis the component type
metric nameis the name of the metric
stack attributeis the attribute name of which its value is used to
calculate the metric value
index attributeis the attribute name of which its value is used to
define the index value of the attribute name
<attribute name>

When entering 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 selected value 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 the selected index
value is 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 entering 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 entering 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, 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 define	is the attribute name of which its value is used to
	the index value of the attribute name <attribute
name>	

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