CHAPTER 11

Accessing Data from the Web Interface

This chapter provides information about accessing Cisco Mobile Wireless Transport Manager (MWTM) data from the MWTM web interface by using a web browser.

This chapter contains:

Supported Browsers

The MWTM web interface is supported on the following browsers:

- Microsoft Internet Explorer version 6.0 and 7.0 on Microsoft Windows operating system
- Mozilla Firefox 2.0 on Solaris 9 and Red Hat Linux Enterprise AS 4.0 operating system
- Mozilla Firefox 3.5+ on Solaris 10 and Red Hat Linux Enterprise 5.3 and Microsoft Windows operating systems.

Note The first time you attempt to connect to the MWTM server using Firefox 3.0, you must add an exception to allow the connection. See Importing an SSL Certificate to an MWTM Client, page 2-27 for more information.

Checking Your Browser

To check your browser and screen settings, from the MWTM web interface Home page, select **Browser Checker**.

Note Opening the MWTM in an unsupported browser generates a warning. Also, if JavaScript is not enabled, the MWTM web interface cannot function.

The Browser Checker window contains:

Pane or Field	Description
Browser Information	
Browser	The name and version of the browser you are using.
Browser User Agent	Text string sent to identify the user agent to the server. Typically includes information such as the application name, version, host operating system, and language.
Platform	The platform type. For example, Win32.
Cookies Enabled	Whether you have cookies enabled on the browser (Yes or No).
Javascript Enabled	Whether Javascript is enabled (Yes or No).
AJAX Component	The Asynchronous JavaScript and XML (AJAX) component sends asynchronous HTTP update requests. The MWTM web application is only accessible to web browsers that have an AJAX component enabled. Typical values include XMLHttpRequest (for Mozilla-based browsers) and MSXML2.XmlHttp (for IE 6).
Screen Information	
Size	Resolution of the display; for example, 1600 x 1200.
Color Depth	Depth of the color display; for example, 16.

Accessing the MWTM Web Interface

The home page of the MWTM web interface is the first window to appear when you launch the MWTM web interface.

To access the MWTM web interface, use one of these methods:

- Open a browser and enter **http://*mwtm_server*:1774** in the Address field. (1774 is the default port).

Note Accessing the MWTM web interface through a URL other than ***http://mwtm-server:*1774** is not supported.

- From the MWTM client interface, choose **View > MWTM Web Links > Home**.

The MWTM Home page window opens in the browser window. For details about the Home page, see Displaying the Home Page, page 11-12.

Overview of the MWTM Web Interface

The MWTM web interface shows basic information about the events and objects that the MWTM manages. The MWTM web interface shows:

Pane	Description
Title Bar	Shows: • Mobile Wireless Transport Manager, version, and server name • Managed networks (can be any combination of IP-RAN, ITP, CSG1, CSG2, GGSN, BWG, HA, PDNGW, SGW, PCRF, and PDSN) • Logout (appears only if you enable user access; see Configuring User Access, page 2-1) • Help—Click this link to access context-sensitive online help • Preferences—Click this link to access preferences that you can change from the web interface (see Changing Web Preference Settings, page 4-19)
Location bar	Shows where you currently are in the MWTM navigation tree.
Navigation Tree	In the left pane, shows a tree of information organized by categories (see MWTM Web Interface Navigation Tree, page 11-3).
Content Area	In the right pane, shows detailed information about the object chosen in the navigation tree (see MWTM Web Interface Content Area, page 11-5).

MWTM Web Interface Navigation Tree

You can easily navigate the features of the MWTM web interface by using the navigation tree in the left pane. By default, the navigation tree is sorted by alarm severity, with objects having the most severe alarms appearing at the top of the tree.

Note To learn more about alarm severity, see Chapter 9, "Managing Alarms and Events."

To view detailed information about a selection in the navigation tree, click the item in the tree. The content area in the right pane shows details about the chosen item. A plus (+) or minus (-) just to the left of the item indicates whether the item has subtending items under its domain.

The MWTM automatically updates the navigation tree when changes occur to discovered nodes or to the network. When any changes occur in the MWTM client navigation tree, the MWTM web interface reflects these changes in its navigation tree. For example, if you delete a node in the MWTM client, the MWTM web interface removes that node from its navigation tree.

Note For information about the navigation tree in the MWTM client interface, see MWTM Client Navigation Tree, page 3-16.

The MWTM web interface navigation tree contains:

GUI Element	Description
 Sort tree by name	Sorts all content in the navigation tree alphabetically by name.
 Sort tree by status	Sorts all content in the navigation tree by status, from the highest alarms to the lowest.
Home	Shows links to MWTM client software, Cisco documentation, and information about the MWTM on the Cisco web (see Displaying the Home Page, page 11-12).
Administrative	The Administrative page of the MWTM web interface provides the following tabs: General—Shows MWTM system information including messages, logs, status, and properties. See Viewing General Tab Details, page 12-2. SNMP—Provides access to SNMP (Simple Network Management Protocol) Editor to edit the SNMP settings. See Viewing SNMP Tab Details, page 12-19. Credentials—Provides access to Device Credentials Editor to edit the credential details for the nodes. Viewing Credentials Tab Details, page 12-21. Discovery—Allows you to discover the network. Viewing Discovery Tab Details, page 12-24. User Management—Displays all users in the system along with the time of their most recent login, their access level, and their account status. Viewing User Management Tab Details, page 12-30. If MWTM User-Based Access is enabled, only users with authentication level 3 (Network Operator) and higher can see all options. Users of all other levels see only the System Information and System Status panes.
Active Alarms	Shows alarms (see Displaying Alarms and Events, page 11-19).
Event History	Shows information about the events delivered by the MWTM event logger and event processor for events that the MWTM event logger and event processor deliver for all objects in the current network view (see Displaying Alarms and Events, page 11-19).
Summary Lists	Shows summaries of all objects that the MWTM manages (see Displaying Summary Lists, page 11-20).
Reports	Common Statistics—Shows common statistic reports for AAA, CPU, IP Local Pool, Interface, and Memory. For more information, see Viewing Common Statistics Reports, page 13-10. ITP Statistics—Shows ITP statistic reports for AS, ASP, GTT Rates, Link, Link-Multi-Day, Linkset, MLR, MSU Rates, and SCTP. For more information, see Viewing ITP Statistics Reports, page 13-45. Mobile Statistics—Shows mobile statistic reports for CSG, GGSN, PDNGW, PDSN, and SGW. For more information, see Viewing Mobile Statistics Reports, page 13-103. RAN Statistics—shows RAN statistic reports for PWE3, QOS, and RAN-Optimized. For more information, see RAN-Optimized Reports, page 13-290. ITP Accounting—Shows ITP accounting reports for AS, GTT, and MTP3. For more information, see Viewing ITP Accounting Reports, page 13-304. Mobile Subscribers—Shows subscriber account reports for BWG, CSG, GGSN, HA, PDNGW, PDSN, and SGW. For more information, see Viewing Mobile Subscribers Reports, page 13-307.

GUI Element	Description
File Archive	Events—Shows archived events. For more information, see Viewing Archived Event Files on the Web, page 9-24. Inventory—Shows archived inventory reports. For more information, see Viewing File Archive Inventory Reports, page 13-338 Common Statistics—Shows archived common statistic reports. For more information, see Viewing File Archive Common Statistics Reports, page 13-340. ITP Statistics—Shows archived ITP statistic reports. For more information, see Viewing File Archive ITP Statistics Reports, page 13-347. Mobile Statistics—Shows archived Mobile statistic reports. For more information, see Viewing File Archive Mobile Statistics Reports, page 13-361. RAN Statistics—Shows archived RAN statistic reports. For more information, see Viewing File Archive RAN Statistics Reports, page 13-377. ITP Accounting—Shows archived ITP accounting reports. For more information, see Viewing File Archive ITP Accounting Reports, page 13-382. Mobile Subscribers—Shows archived mobile subscribers reports. For more information, see Viewing File Archive Mobile Subscribers Reports, page 13-383.
Tools	Provides tools for launching CiscoView, and Device Center. Provides a search tool for Home Agent and APN subscribers and Events and Alarms tool (see Tools, page 11-26).
Groups	Displays user-defined groups (see Understanding Device Groups, page 11-30).
DEFAULT View	Shows a current list of nodes in the DEFAULT view.

MWTM Web Interface Content Area

The content area of the MWTM client interface is fully described in MWTM Client Content Area, page 3-17. That description also applies to the web interface. Additional navigational features that appear only in the web interface include:

- Customizing Date and Time Ranges, page 11-5
- Using the Toolbar, page 11-6

Customizing Date and Time Ranges

Some windows require that you select date ranges for generating historical graphs and for synchronizing alarms. The **Customize the date and time range** tool allows you to choose the dates with server timezone.

To customize the date range:

Step 1 Click the **Customize the date and time range** tool in the toolbar of the content area. The Choose a Date Range *server timezone* dialog box appears.

Step 2 Enter:

a. Begin Date and End Date; or, select those dates by clicking the Calendar tool. These dates are the dates with server timezone.

b. Begin Hour and End Hour from the drop-down menus, if they are available.

Note The dialog box shows an error if the End Date is equal to or less than the Begin Date. Correct the error before proceeding.

Step 3 Click **OK** to accept the date and time changes; or, **Cancel** to cancel this operation.

The MWTM web interface accepts and applies the changes either by generating a report for the chosen server time (in case of reports) or by synchronizing the alarms (in case of alarm synchronization).

Using the Toolbar

Depending upon the object you select in the navigation tree, the web interface toolbar provides these tools and options:

Tool or Function	Description
Last Updated	Date and time the MWTM last updated the information on the page.
Page	Shows where you are (page X of X total pages) and lists the total number of entries.
 Refresh	Forces a refresh of the current web page. Click this icon to refresh the current page.
Status Refresh Interval	Allows you change the default refresh interval of 180 seconds. Enter a value between 180 and 900 seconds. **Note** Changes you make are temporary to the current page. Navigating away from the page sets the status refresh interval back to the default setting. To change the default setting, see Changing Web Preference Settings, page 4-19.
Page Size	Drop-down list of different page sizes (the number of table rows in the display). Click the drop-down arrow to select a different value. The value that you select becomes the default page size for all pages in the web interface. The title bar displays the current page and total number of table entries.

Tool or Function	Description
Quick Search	Text box to filter the objects listed under the Summary List tables (Except for IP Addresses and Point Code tables). Enter the string in the text box to filter the table by and then press Enter. The rows under the table are filtered based on the string entered. Below are the details for each Summary table about which columns are used for looking for the filtered string: • Alarms: Internal ID, Node, Feature • Nodes: Internal ID, Display Name, Primary SNMP Address, Node Type, Feature, Software Version, Serial Number, Reboot Reason, Status Reason • Signaling Points: Internal ID, Name, Node, Network Name, Point Code, Variant, Network Indicator, Status Reason • Linksets: Internal ID, Name, Node, Signaling Point, Local Point Code, Adjacent Point Code, Linkset Type, Status Reason • Links: Internal ID, Node, Signaling Point, Linkset, Type, Status Reason • Application Servers: Internal ID, Name, Node, Signaling Point, Protocol, Routing Key, Traffic Mode, Status Reason • Application Server Processes: Internal ID, Name, Node, Local IP Address, Status Reason • Application Server Process Associations: Internal ID, Name, Node, Signaling Point, Application Server, Protocol, Congestion Level, Status Reason • Signaling Gateway Mated Pairs: Internal ID, Name, Mate, Node, Congestion Level, Status Reason • Interfaces: Internal ID, Name, Node, Interface Type, Status Reason • Cards: Internal ID, Name, Node, Card Type, Model Name, Description, Status Reason, Hardware Version, Firmware Version, Software Version • RAN Backhauls: Internal ID, Name, Node, Location, Peer Name, Peer Node, Type, Status Reason • RAN Shorthauls: Internal ID, Name, Node, Type, Location, Peer Name, Peer Node, Interface Type, Status Reason • PWE3 Backhauls: Internal ID, Name, Node, Peer Name, Peer Node, Status Reason • PWE3 Virtual Circuits: Internal ID, Name, Node, Peer Name, Peer Node, Type, PSN Type, Remote Interface String, Description, Status Reason • Access Point Names: Internal ID, Name, Status Reason • Software Versions: Name, Node Type, Software Version, Software Description
>	Advances the display to the next page of information.
>>	Advances the display to the last page of information.
<	Advances the display to the previous page of information.
<<	Advances the display to the first page of information.
 Modify event filter	Opens the Event Filter dialog box. You can create a filter to display only the events in which you are interested (see Setting Alarm or Event Filters, page 9-12).
 Remove	Applies or removes a filter that you created.

Tool or Function	Description
Archived	Link that shows only archived alarms or events. This link appears when you select Event History or Active Alarms in the navigation tree. It also appears when you click the Alarms tab or Recent Events tab for a specific object. **Caution** In the *Server.properties* file, you can limit the number of rows in the archived events table with the MAX_ARCHIVED_EVENT _DB_ROWS property. The default value is 200,000. Increasing this value can have severe impact on server performance and can cause the server to run out of memory.
 Customize the date and time range	Opens the Choose a Date Range *Server timezone* dialog box (see Customizing Date and Time Ranges, page 11-5).
 Graph Series Editor	Opens the Graph Series Editor dialog box, which provides a check box for each available data series. Check the check box to display a series, and uncheck the check box to hide a series. If you click **OK** without selecting a series, it is the same as clicking Cancel. By default, the MWTM displays no more than 12 series by default. To change this default setting, see Display Series Dialog Box, page 7-115.
 Run	Runs the report type for the chosen duration.
 Export the report as a CSV file	Exports the data in the table to comma-separated value file (CSV file). You can save this file to disk or open it with an application that you choose (for example, Microsoft Excel).
Data Range (*timezone*)	Label that shows the chosen time range for the historical statistics. The label displays the data range with server time.
Type	Drop-down list of report types.
Duration	Drop-down list of default time ranges. Select one of these options, then click the **Run** tool. To specify a nondefault time range, click the **Customize Date and Time Range** too.
Output	Drop-down menu that provides these options: • Graph—Displays statistical data in graphs and tables • Table—Presents statistical data in tabular format only • CSV—Exports statistical data using comma-separated values
Sort Parameter	Used in the graph output of certain reports to select the criteria for including a top set of series and for ordering the corresponding graphs displayed.
 Pause	Pauses the page refresh feature. Click Pause to disable the page refresh that would normally occur after the Status Refresh Interval. Click Pause again to re-enable the Status Refresh Interval.
 Edit Notes	Enables you to edit or add notes for events.

Tool or Function	Description
Slow Poller Interval	Allows you to change the default slow poller interval of 60 seconds. Enter a value between 60 and 300 seconds. **Note** Changes you make are temporary to the current page. Navigating away from the page sets the status refresh interval back to the default setting. To change the default setting, see Changing Web Preference Settings, page 4-19.
Fast Poller Interval	Allows you to change the default fast poller interval of 15 seconds. Enter a value between 5 and 60 seconds. **Note** Changes you make are temporary to the current page. Navigating away from the page sets the status refresh interval back to the default setting. To change the default setting, see Changing Web Preference Settings, page 4-19.
Reset Counters	Enables you to modify the counter reset settings to one of the following: • Show counters since reboot • Show counters since last poll • Show counters since user reset
Launch	Drop-down list of applications you can launch: • CiscoView (This option is available only for non SAMI nodes and is not displayed for PCRF nodes) • Device Center (This option is not displayed for PCRF nodes) • Node Home Page (This option is displayed based on the CiscoWorks user configuration) After you choose the application, click the  Run icon to launch it.
Severity	Drop-down list of the severities of alarms or events. Severity can be Critical, Major, Minor, Warning, Informational, Indeterminate, or Normal. This drop-down list appears when you select Event History or Active Alarms in the navigation tree. It also appears when you click the Alarms tab or Recent Events tab for a specific object.
Change Severity	Button to change the severity level of an alarm or event. To change the severity level, select one or more alarms or events by clicking the corresponding check boxes, choose a severity from the Severity drop-down list, then click Change Severity. This button appears when you select Event History or Active Alarms in the navigation tree. It also appears when you click the Alarms tab or Recent Events tab for a specific object.
Clear Selection	Link to clear the selection of one or more events or alarms. To select one or more alarms or events, check the corresponding check boxes. To clear the selection, click the Clear Selection link. This button appears when you select Event History or Active Alarms in the navigation tree. It also appears when you click the Alarms tab or Recent Events tab for a specific object.
Toolbar for alarms and events	The web interface provides the same toolbar for alarms and events as the client interface. For full descriptions of these tools, see Toolbar Buttons, page 9-8.

Tool or Function	Description
Actions	Drop-down menu appears when you hover over the Actions button. The Actions button is displayed for all the object based Summary Lists (i.e. except Node Distributions, Alarms, Software Versions, IP Addresses, and Point Code), Management interfaces and Physical folders of the nodes under the navigation tree, and under the Details tab of all the objects. **Note** Users with authentication level 1 cannot see the Actions button. Also, the Manage and Ignore options have separate permissions for Manage/Unmanage and Ignore/Unignore. The menu item is not shown if both the permissions are invalid. **Note** The Action Menu appears in the Shorthauls tab for Backhauls and in the Nodes tab for APNs. For all the objects/summary lists except APN the drop-down menu contains: • Normal Poll Node—Polls the chosen nodes. • Clean Poll Node—Polls all chosen nodes and removes any Unknown objects after the completion of the poll. • Provision—Allows you to provision the objects. • Edit Properties—Opens the MWTM: Edit Properties Dialog window. • Edit SNMP IP Addresses—Opens the MWTM: Edit SNMP IP Addresses Dialog window. • Ignore/Unignore—Ignores or stops ignoring the chosen object at the next polling cycle. • PM Mode Enable/PM Mode Disable—Enables or disables the PM mode for the chosen object at the next polling cycle. • Manage/Unmanage—Labels the chosen node Managed or Unmanaged. The option Manage or Unmanage is displayed based on the selected item. • Allow Trap Processing/Disallow Trap Processing—Enables or disables the MWTM to process traps from the chosen node. The option Allow Trap Processing or Disallow Trap Processing is displayed based on the selected item. • Allow Report Polling/Disallow Report Polling—Enables or disables the report polling. The option Allow Report Polling or Disallow Report Polling is displayed based on the selected item. This option is not displayed for RAN-O and ONS nodes. • Delete—Deletes the chosen object. For Management interfaces and Physical folders of the nodes, the drop-down menu contains: • Ignore/Unignore—Ignores or stops ignoring the chosen object at the next polling cycle. For APNs the drop-down menu contains the following options: • Search for APN Subscriber—Used to search for a specific subscriber across one or more designated GGSN, PDNGW, SGW, and SPGW subscribers. See Searching for APN Subscribers, page 11-29 for more information. • Ignore/Unignore—Ignores or stops ignoring the chosen object at the next polling cycle. • Delete—Deletes the chosen object. The Details tab of the groups created contains the Actions drop-down menu which contains the following options: • Batch Provision—Used to perform Batch Provisioning. See Batch Provisioning, page 11-33. **Note** The Actions button does not appear for the groups if they do not have a batch file of the corresponding node type.

MWTM: Edit Properties Dialog

The Edit Properties option is available under the Actions menu on the Details tab of all the nodes and on the Details tab of ITP node signaling points. This options opens MWTM: Edit Properties Dialog window that has editable properties.

Node properties include Name and Interface Structure. For the editable signaling point properties, only the Name is editable.

The MWTM: Edit Properties Dialog window contains:

Field or Button	Description
Name	Name of the node. The name field is green for valid input and is red for invalid input. The name may include up to 100 alphanumeric and the special characters hyphen (-), underscore (_), period (.), and colon (:). The Save option is disabled for the invalid name. After saving, this new name gets displayed in the navigation tree and in the Details panel. **Note** The character '.' is allowed only when the resulting name is a valid hostname.
Interface Structure	Drop-down menu to configure the way the MWTM displays the physical interfaces of a node (excluding the ONS node). Choices include: • Default—Restores the interface structure to the default setting for the node. For example, if the default structure is hierarchical, choosing this option restores the parent-child hierarchy in the Physical folder. **Note** In cases where the MWTM cannot determine the interface hierarchy of a node, the MWTM sets its default structure to be flat (that is, all interfaces appear at the same level). • Force Flat—Forces the interface structure of a node to be flat (that is, no hierarchy). All interfaces in the Physical folder appear at the same level. Force Hierarchical—Forces the interface structure of a node to be hierarchical (that is, to display parent-child relationships among interfaces).
Save	Saves the changes you have made.
Restore	Restores the changes that you make to the fields of the Edit Properties dialog box and leaves the dialog box open.
Cancel	Closes the window without saving the changes you have made.
Help	Displays online help for this window.

MWTM: Edit SNMP IP Addresses Dialog

The Edit SNMP IP Addresses option is available under the Actions menu on the Details tab of all the nodes. This options opens MWTM: Edit SNMP IP Addresses Dialog window that has editable properties.

The Edit SNMP IP Addresses option is available only for the users with authentication level 4 and level 5.

The MWTM: Edit SNMP IP Addresses Dialog window contains:

Field or Button	Description
Available IP Addresses	List of all IP addresses associated with this node that users could not or do not want the MWTM to use for SNMP polling.
IP Addresses for SNMP	Lists the IP addresses associated with the node, including the primary SNMP address and all backup IP addresses, that are intended for SNMP.
Add	Adds the IP Addresses from the Available IP Address box to the IP Addresses for SNMP box. This option is disabled if there is no IP address in the Available IP Address box.
Remove	Removes the IP Addresses from the IP Addresses for SNMP box and adds to the Available IP Addresses box. This option is disabled if there is no IP address in the IP Addresses for SNMP box.
Raise	Moves the selected IP address one level up in the IP Addresses for SNMP box. This option is disabled if there is only one IP address in the IP Addresses for SNMP box.
Lower	Lowers the selected IP address one level below in the IP Addresses for SNMP box. This option is disabled if there is only one IP address in the IP Addresses for SNMP box.
Save	Saves the changes you have made.
Cancel	Closes the window without applying any changes you have made.
Help	Displays online help for this window.

Displaying the Home Page

The MWTM web interface Home page provides access to MWTM client software, Cisco documentation, and information about the MWTM.

To access the Home page of the MWTM web interface, click **Home** under the navigation tree in the left pane.

The content area in the right pane shows these GUI elements:

Pane	GUI Element	Description
Client Software	Download Windows Client Download Solaris Client Download Linux Client Browser Checker	Shows the download instructions for the: • Windows client • Solaris client • Linux client • Information about the browser and screen display For details, see Downloading the MWTM Client from the Web, page 11-16.
MWTM on Cisco.com	MWTM Home Page MWTM Software Download Page Latest MWTM Documentation Engineering Software Updates (FTP) MWTM Supported IOS Releases	Shows hyperlinks to: • MWTM information on the Cisco website • MWTM software download from Cisco.com • Most recent versions of MWTM documentation • Software updates provided by Cisco Engineering • Supported IOS Releases document for the current release For details, see Accessing Software Updates and Additional Information, page 11-17.
User Documentation	README CHANGES Help Home Page Frequently Asked Questions Release Notes Install Guide User Guide OSS Integration Guide Alarm Guide Third Party and Open Source Copyrights	Shows: • *README.txt* file • Major new changes for the release • Online Help system for the MWTM • HTML version of the FAQs • PDF versions[1] of the: – *Release Notes for Cisco Mobile Wireless Transport Manager* – *Installation Guide for Cisco Mobile Wireless Transport Manager* – *User Guide for Cisco Mobile Wireless Transport Manager* – *OSS Integration Guide for Cisco Mobile Wireless Transport Manager* – *Alarm Guide for Cisco Mobile Wireless Transport Manager* – *Third Party and Open Source Copyrights* For details, see Viewing the MWTM Technical Documentation, page 11-17.

Pane	GUI Element	Description
System Documentation	MWTM Server Help Command Large Deployment Tuning README (pdf) Bandwidth Usage README Export Reports README MWTM Supported SNMP MIBs	Shows: • CLI output of the **mwtm help** command • Document on **MWTM Tuning for Large IP-RAN deployment** • *README-Bandwidth-Usage.txt* file • *README-ExportReports.txt* file • Lists of MIBs, which may include: – (*IPRAN only*) RAN MIBs – (*ITP only*) ITP MIBs – (*mSEF only*) CSG1 MIBs – (*mSEF only*) CSG2 MIBs – (*mSEF only*) GGSN MIBs – (*mSEF only*) BWG MIBs – (*mSEF only*) HA MIBs – (*PDNGW only*) PDNGW MIBs – (*SGW only*) SGW MIBs – (*SPGW only*) SPGW MIBs – (*PDSN only*) PDSN MIBs – (*PCRF only*) PCRF MIBs – Common MIBs For details, see MIB Reference, page F-1.

Pane	GUI Element	Description
Managed Platform Documentation	• (*ITP only*) ITP OS README • (*IPRAN only*) IP-RAN OS README • (*mSEF, CSG1 only*) Content Service Gateway 1 (CSG1) OS README • (*mSEF, CSG2 only*) Content Service Gateway 2 (CSG2) OS README • (*mSEF, GGSN only*) Gateway GPRS Service Node (GGSN) OS README • (*mSEF, HA only*) Home Agent (HA) OS README • (*mSEF, BWG only*) Broadband Wireless Gateway (BWG) OS README • (*mSEF, PDSN only*) Packet data Serving Node (PDSN) OS README • (*mSEF, PDNGW only*) Packet Data Network Gateway (PDNGW) OS README • (*mSEF, SGW only*) Serving Gateway (SGW) OS README • (*mSEF, SPGW only*) Serving Gateway/PDN Gateway (SPGW) OS README • (*mSEF, PCRF only*) Policy and Charging Rules Function (PCRF) OS README	• *MWTM-OS-Info-ITP* file • *MWTM-OS-Info-IPRAN* file • *MWTM-OS-Info-CSG1* file • *MWTM-OS-Info-CSG2* file • *MWTM-OS-Info-GGSN* file • *MWTM-OS-Info-HA* file • *MWTM-OS-Info-BWG* file • *MWTM-OS-Info-PDSN* file • *MWTM-OS-Info-PDNGW* file • *MWTM-OS-Info-SGW* file • *MWTM-OS-Info-SPGW* file • *MWTM-OS-Info-PCRF* file For details, see Viewing Managed Platform Documentation, page 11-18.

1. To access the latest versions, go to the parent index for Cisco MWTM user documents: http://www.cisco.com/en/US/products/ps6472/tsd_products_support_series_home.html

Downloading the MWTM Client from the Web

You can access the MWTM client installation software for Linux (unsupported), Solaris, and Windows from the MWTM web interface Home page. This access is useful if you do not have the CD-ROM, or if you prefer to download the software by using your web browser. Once you have downloaded the MWTM client installation software to your workstation, you must install the software on your local system.

For more information about installing the MWTM client software by using a web server, see the following chapters in the *Installation Guide for Cisco Mobile Wireless Transport Manager 6.1.7:*

- "Installing the MWTM on Solaris"
- "Installing the MWTM on Windows"
- "Installing the MWTM on Linux"

Related Topics

- Downloading the Solaris Client, page 11-16
- Downloading the Windows Client, page 11-16
- Downloading the Linux Client (Unsupported), page 11-16

Downloading the Solaris Client

To access the MWTM Client for Solaris page, select **Download Solaris Client**.

The web interface shows the supported Solaris versions and instructions for downloading the Solaris client. See the *Installation Guide for Cisco Mobile Wireless Transport Manager 6.1.7* for a detailed procedure.

To start the client after installation, add the */opt/CSCOsgmClient/bin* subdirectory to your path, then enter the **mwtm client** command from the command line.

Downloading the Windows Client

To access the MWTM Client for Windows page, select **Download Windows Client**.

The web interface shows supported Windows versions and instructions for downloading the Windows setup program. After downloading the setup program onto your desktop or other Windows directory, double-click the **setup.exe** icon to start the setup program and launch the installation wizard. See the *Installation Guide for Cisco Mobile Wireless Transport Manager 6.1.7* for detailed procedures.

To start the client after installation, launch it from the Windows Start menu or double-click the **MWTM Client** icon on your desktop.

Downloading the Linux Client (Unsupported)

To access the MWTM Client for Linux page, select **Download Linux Client**.

Note The MWTM does not support the MWTM client for Linux. Use the MWTM Linux client under advisement.

The web interface shows the supported Linux versions and instructions for downloading the Linux client. See the *Installation Guide for Cisco Mobile Wireless Transport Manager 6.1.7* for a detailed procedure.

To start the client after installation, add the */opt/CSCOsgmClient/bin* subdirectory to your path, then enter the **mwtm client** command from the command line.

Accessing Software Updates and Additional Information

You can access this information about the MWTM from the MWTM web interface Home page. To:

- View information about the MWTM or any other Cisco product available on Cisco.com, select **Cisco Home Page**.
- Read Cisco literature associated with the MWTM, including product data sheets, Q and As, and helpful presentations, select **MWTM Home Page**.
- Access software updates for the MWTM from Cisco.com for FTP, select **Engineering Software Updates (FTP)**. The Cisco Systems Engineering FTP server page appears.
- Access software updates for the MWTM from Cisco.com, select **MWTM Software Download Page**. The Software Download page for the MWTM appears.
- Access the most recent versions of customer documentation for the MWTM, select **Latest MWTM Documentation**. The Cisco Mobile Wireless Transport Manager documentation page on Cisco.com appears. From this page, you can view the latest versions of MWTM release notes, installation guides, and end-user guides.

Note If you cannot access Cisco.com from your location, you can always view the customer documentation that was delivered with the MWTM software. See the Viewing the MWTM Technical Documentation, page 11-17.

Viewing the MWTM Technical Documentation

From the MWTM web interface Home page, you can view this MWTM technical documentation. To view the:

- Entire Cisco Mobile Wireless Transport Manager Help System, select **Help Home Page**.
- Entire *User Guide for Cisco Mobile Wireless Transport Manager 6.1.7* as a PDF file on the web, using the Adobe Acrobat Reader, select **User Guide (PDF)**.
- Entire *Installation Guide for Cisco Mobile Wireless Transport Manager 6.1.7* as a PDF file on the web, using the Adobe Acrobat Reader, select **Install Guide (PDF)**.
- Entire *Release Notes for Cisco Mobile Wireless Transport Manager 6.1.7* as a PDF file on the web, using the Adobe Acrobat Reader, select **Release Notes (PDF)**.
- Frequently Asked Questions (FAQs) about the MWTM, select **Frequently Asked Questions**.
- Syntax for every MWTM command, select **MWTM Server Help Command**.

Caution These PDF versions of technical documents might not be the latest versions. For the latest versions, go to: http://www.cisco.com/en/US/products/ps6472/tsd_products_support_series_home.html.

Viewing Managed Platform Documentation

Depending upon which type(s) of network you are managing, you can view the following MWTM managed platform documentation from the MWTM web interface:

- (*ITP only*) **ITP OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-ITP* file. This file contains a list of the supported OS software images for:
  - ITP nodes
  - GTT encoding scheme
  - MLR address table configuration
  - GTT accounting statistics reports
  - Route table and GTT table deployment
  - MSU rates
  - ITP provisioning

  To access the MWTM ITP OS README page, choose **ITP OS README** from the MWTM Home page.
- (*IPRAN only*) **IPRAN OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-IPRAN* file. This file contains a list of the supported OS software images for:
  - MWR nodes
  - ONS nodes
  - RAN SVC cards

  To access the MWTM IPRAN OS README page, choose **IPRAN OS README** from the MWTM Home page.
- (*mSEF, CSG1 only*) **CSG1 OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-CSG* file. This file contains a list of the supported OS software images for CSG1.

  To access the MWTM CSG1 OS README page, choose **CSG1 OS README** from the MWTM Home page.
- (*mSEF, CSG2 only*) **CSG2 OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-CSG2* file. This file contains a list of the supported OS software images for CSG2.

  To access the MWTM CSG2 OS README page, choose **CSG2 OS README** from the MWTM Home page.
- (*mSEF, GGSN only*) **GGSN OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-GGSN* file. This file contains a list of the supported OS software images for GGSN.

  To access the MWTM GGSN OS README page, choose **GGSN OS README** from the MWTM Home page.
- (*mSEF, HA only*) **HA OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-HA* file. This file contains a list of the supported OS software images for HA.

To access the MWTM HA OS README page, choose **HA OS README** from the MWTM Home page.

- (*mSEF, BWG only*) **BWG OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-BWG* file. This file contains a list of the supported OS software images for BWG.

  To access the MWTM BWG OS README page, choose **BWG OS README** from the MWTM Home page.

- (*mSEF*, *PDSN only*) **PDSN OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-PDSN* file. This file contains a list of the supported OS software images for PDSN.

  To access the MWTM PDSN OS README page, choose **PDSN OS README** from the MWTM Home page.

- (*mSEF, PDSN only*) **PDNGW OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-PDNGW* file. This file contains a list of the supported OS software images for PDNGW.

  To access the MWTM PDNGW OS README page, choose **PDNGW OS README** from the MWTM Home page.

- (*mSEF, SGW only*) **SGW OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-SGW* file. This file contains a list of the supported OS software images for SGW.

  To access the MWTM SGW OS README page, choose **SGW OS README** from the MWTM Home page.

- (*mSEF, SPGW only*) **SPGW OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-SPGW* file. This file contains a list of the supported OS software images for SPGW.

  To access the MWTM SPGW OS README page, choose **SPGW OS README** from the MWTM Home page.

- (*mSEF, PCRF only*) **PCRF OS README**—Shows the contents of the */opt/CSCOsgm/install/MWTM-OS-Info-PCRF* file. This file contains a list of the supported OS software images for PCRF.

  To access the MWTM PCRF OS README page, choose **PCRF OS README** from the MWTM Home page.

Displaying Alarms and Events

To display alarms in the web interface, click **Active Alarms** in the navigation tree, or select an object in the navigation tree and click the Alarms tab.

To display events in the web interface, click Event History in the navigation tree, or select an object in the navigation tree and click the Recent Events tab.

Viewing alarms and events in the web interface is essentially the same as viewing them in the MWTM client. Only minor differences exist:

- A paging feature for paging through large tables.
- A refresh interval that you can change.
- An Archived link for viewing archived alarms.
- Alarm selection by check box and a Clear Selection link.

- Severity drop-down list and a Change Severity button.

For detailed descriptions of these tools, see the "Using the Toolbar" section on page 11-6.

For descriptions of the columns, see the "Right-click Menus" section on page 9-11.

Displaying Summary Lists

Displaying Summary Lists in the web interface is essentially the same as displaying them in the MWTM client. Only minor differences exist. Clicking on an object under the Summary Lists in the web interface causes the content area to show information about the object.

For details on:

- Navigating table columns, see Navigating Table Columns, page 4-24.
- The toolbar, see Using the Toolbar, page 11-6.

For complete information about Summary Lists, see the Displaying Object Windows, page 8-3.

Displaying Software Versions

The Software Versions table lists the software versions for each node the MWTM manages.

To access the Software Versions page:

- From the Web interface navigation tree, choose **Summary Lists > Nodes > Software Versions**.
- From the MWTM main window, choose **View > MWTM Web Links > Software Versions**.

For details on:

- Navigating the columns of the Software Versions table, see Navigating Table Columns, page 4-24.
- The toolbar, see Using the Toolbar, page 11-6.

The Software Versions table contains:

Column	Description
Name	Name of the node. This column is displayed by default.
Node Type	Type of node. This column is displayed by default.
Feature	Name of the feature. This column is displayed by default.
Software Version	Software version used by the node. This column is displayed by default.
Software Description	Full software version information. This column is displayed by default.

Displaying Status and Summary Reports

You can view a table, graph, or CSV file that shows the overall state of the available MWTM reports, the time the server took to gather data from the network and store it in the database, and enable or disable reports from the report page. You can also run hourly and daily performance summary reports.

Step 1 In the MWTM Web interface, in the navigation tree, click **Reports**. The Report Status window appears as described in Viewing Report Status, page 11-21.

Step 2 From the Type pulldown menu, select one of the following types of reports:

- Report Status—See Viewing Report Status, page 11-21.
- Performance Summary Hourly—See Performance Summary Hourly Report, page 11-22.
- Performance Summary Daily—See Performance Summary Daily Report, page 11-23.

Step 3 Select a duration and output type. See the "Using the Toolbar" section on page 11-6 for more information about these fields.

Viewing Report Status

The Reports page in the MWTM web interface allows you to view a table, graph, or CSV file that shows the overall state of the available MWTM reports. You can also enable or disable reports from the report page.

Note Only reports that run on a regularly scheduled interval are displayed in the Hourly and Daily data. Reports that run continuously are not displayed.

Note Only reports that run on a regular scheduled interval display information in the following columns:Last Start Time, Last End Time, and Duration. Reports that run continuously display *N/A* for these columns. A report that has not yet run has *Unknown* in the above columns.

To access the main Reports page:

Step 1 Do one of the following:

- In a web browser, launch the MWTM web interface (see Accessing the MWTM Web Interface, page 11-2). In the navigation tree, click **Reports**.
- From the MWTM client, in the MWTM main window, choose **View > MWTM Web Links > Reports**.

The Reports page in the content area shows the Report Type and the status (enabled or disabled). If you have generated a report, a green status ball and the word "Enabled" appear in the Status column. If you have not generated a report, a red status ball and the word "Disabled" appears.

Note Clicking a Report Type takes you directly to the report data page.

The Status column indicates whether you have enabled or disabled data gathering for the specified report type.

Step 2 To enable a report in the MWTM Web interface, click "Disabled" in the Status column. The Status changes "Enabled" and a green status ball appears.

Performance Summary Hourly Report

The Performance Summary Hourly Report shows the time it takes to gather the data from the network and store it in the database. This report shows data for reports that are invoked via an hourly cronjob only and not reports that run continuously.

Step 1 In the MWTM Web interface, in the navigation tree, click **Reports**. The Report Status window appears as described in Viewing Report Status, page 11-21.

Step 2 From the Type pulldown menu, select **Performance Summary Hourly**.

GUI Element	Description
Toolbar	Provides functions to select a report type, duration, output type. See Using the Toolbar, page 11-6.
Table	If you select the Output Type **Table**, the table contains: • Report Type—Type of report. • Start Time (*timezone*)—Time the report started. • End Time (*timezone*)—Time the report ended. • Duration (secs)—Time it took to run the report. • Object Count—Number of objects on which the report was run. **Note** If the Output Type is Table or CSV, the same data is presented but the column headings are labeled by data type.
Expand to Full Screen	If Output Type is Graph, this text link displays the graph in a new, full-screen window for easier viewing.
Duration (Secs)	If Output Type is Graph, Y-axis label that shows duration in second. **Note** If no data exists between any two data points, the graph displays a color-coded vertical bar to show the period for which no data is available.
Time	If Output Type is Graph, X-axis label that shows a historical time scale and the server time zone.
Legend	If Output Type is Graph, color-coded legend that shows labels for output.

Performance Summary Daily Report

The Performance Summary Daily Report shows the time it takes to gather the data from the network and store it in the database. This report shows data for reports that are invoked via a daily cronjob only and not reports that run continuously.

Step 1 In the MWTM Web interface, in the navigation tree, click **Reports**. The Report Status window appears as described in Viewing Report Status, page 11-21.

Step 2 From the Type pulldown menu, select **Performance Summary Daily**.

GUI Element	Description
Toolbar	Provides functions to select a report type, duration, output type. See Using the Toolbar, page 11-6.
Table	If you select the Output Type **Table**, the table contains: • Report Type—Type of report. • Start Time (*timezone*)—Time the report started. • End Time (*timezone*)—Time the report ended. • Duration (secs)—Time it took to run the report • Object Count—Number of objects on which the report was run. • If the Output Type is Table or CSV, the same data is presented but the column headings are labeled by data type.
Expand to Full Screen	If Output Type is Graph, this text link displays the graph in a new, full-screen window for easier viewing.
Duration (Secs)	If Output Type is Graph, Y-axis label that shows duration in second. **Note** If no data exists between any two data points, the graph displays a color-coded vertical bar to show the period for which no data is available.
Time	If Output Type is Graph, X-axis label that shows a historical time scale and the server time zone.
Legend	If Output Type is Graph, color-coded legend that shows labels for output.
Bits/Sec or Bytes/Sec	If Output Type is Graph, Y-axis label that shows traffic rate in bits per second. The Y axis automatically scales to the interface speed. **Note** If no data exists between any two data points, the graph displays a color-coded vertical bar to show the period for which no data is available.

Viewing Historical Statistics Report Settings

Step 1 In the MWTM Web interface, in the navigation tree, click **Reports**. The Report Status window appears as described in Viewing Report Status, page 11-21.

Step 2 Click the **Settings** tab. The Historical Stats Report Settings information is displayed.

You can click on Disabled or Enabled to change the state of any of the reports.

You can click on any field, except for the Reports Directory field, to modify its value.

Field		Description
General Settings	Reports Directory	Specifies the directory in which the MWTM reports are stored. You must use the CLI to change the directory in which the reports are stored; you cannot click on this field to modify it.
	Time Mode	Specifies the time mode, either 12-hour or 24-hour, for the reports.
	Master Report Flag	If this option is enabled, the individual report settings are used. If this is option is disabled, all reports are turned off.
	Perform Disk Space Checking	Specifies whether disk space checking is enabled or disabled.
	Export Reports	Specifies whether to automatically generate reports in CSV format.
	15 Min Stats Aging (Days)	Specifies the database aging value for 15-minute statistics. When records exceed the specified value, they are aged out of the database.
	Hourly Stats Aging (Days)	Specifies the database aging value for hourly statistics. When records exceed the specified value, they are aged out of the database.
	Daily Stats Aging (Days)	Specifies the database aging value for daily statistics. When records exceed the specified value, they are aged out of the database.
	Monthly Stats Aging (Days)	Specifies the database aging value for monthly statistics. When records exceed the specified value, they are aged out of the database.
	Custom Stats Aging (Days)	Specifies the database aging value for custom statistics. When records exceed the specified value, they are aged out of the database.
	15 Min CSV Aging (Days)	Specifies the database aging value for 15-minute CSV statistics. When records exceed the specified value, they are aged out of the database.
	Hourly CSV Aging (Days)	Specifies the database aging value for hourly CSV statistics. When records exceed the specified value, they are aged out of the database.
	Daily CSV Aging (Days)	Specifies the database aging value for daily CSV statistics. When records exceed the specified value, they are aged out of the database.
	Monthly CSV Aging (Days)	Specifies the database aging value for monthly CSV statistics. When records exceed the specified value, they are aged out of the database.
	Inventory Aging (Days)	Specifies the database aging value for inventory statistics. When records exceed the specified value, they are aged out of the database.
	Node Name Type	Name type for the Node column of the CSV reports. The valid values are: • DNS Name • Custom Name • Sys Name

Field		Description
ITP Report Settings	Show links with no capacity set (nullcaps)	Specifies whether to show links/linksets that do not have planned send and receive capacities.
	Show SCTP IP Links	Specifies whether to show SCTP IP links.
	High In-Service Ratio Threshold	Displays the high value for the In-Service ratio threshold.
	High Utilization Ratio Threshold	Displays the high value for the utilization ratio threshold.

Tools

To access launch and search tools, click **Tools** in the navigation tree of the MWTM web interface. The following options are available:

- Launch Tools, page 11-26
- Events and Alarms, page 11-26
- Search Tools, page 11-28

Launch Tools

If you have integrated with a CiscoWorks server, one or more of the following applications appears in the Launch pane as active links:

- CiscoView
- Device Center

The name of the server appears in parentheses following the application names. To launch an application, click the application name. See Integrating the MWTM with Other Products, page 4-38.

Events and Alarms

The Events and Alarms pane contains the following links:

- Client disconnect sound
- Alarm Synchronization

The Events and Alarms tool allows you to select a sound to be played when the client loses its connection to the MWTM server. By default, no sound is played when the client loses its connection to the server. You must select a sound to be played.

Step 1 Click **Tools** in the navigation tree of the MWTM web interface. From the **Client disconnect sound** pulldown menu, select a sound. The sound you selected is saved.

Step 2 After selecting a client disconnect sound, click **Play** to sample the sound.

Note Make sure you are not logged into the MWTM client at the same time that you are changing the client disconnect sound in the MWTM web interface. Any sound changes you make using the MWTM client override changes you make using the web interface.

You can use the MWTM client interface to create and change event sound filters for the MWTM client as explained in Setting Sounds for Events at an MWTM Client, page 9-38.

Alarm Synchronization

Click the Alarm Synchronization link to open the Alarm Synchronization page. This page contains the following toolbar buttons and the panes:

Toolbar Buttons

The page contains the following toolbar buttons:

Field or Button	Description
Back	Use this button to return to the previous page.
 Forward Alarms	Click this icon to forward the alarms within the specified range.

Trap Target Information

The Trap Target Information pane contains the following fields:

Field or Button	Description
Target Host Name or IP Address	Enter the destination host name or IP address in this text field.
Target Port	Host port number to which the MWTM should forward traps.
SNMP Community String	SNMP community string that the MWTM should include in forwarded traps.

Field or Button	Description
SNMP Version	Trap version to forward. Valid values are 1 and 2c.
Trap Type	Type of trap that the MWTM should forward to this host. Valid trap types are: CISCO-SYSLOG: The CISCO-SYSLOG-MIB clogMessageGenerated trap. CISCO-EPM: CISCO-EPM-NOTIFICATION-MIB ciscoEpmNotificationRev1 trap. CISCO-EPM-2: CISCO-EPM-NOTIFICATION-MIB ciscoEpmNotificationRev2 trap.

Match Alarms by Date Range

The Match Alarms by Date Range pane contains the following fields:

Field or Button	Description
 Customize Date and Time Range	Opens the Customize Date and Time Range dialog box (see Customizing Date and Time Ranges, page 11-5).
Clear	Click this icon to clear the alarm dates and enable match by ID section.
Start Alarm Change Time	The start alarm change time to forward the traps.
End Alarm Change Time	The end alarm change time to forward the traps.

Match Alarms by Alarm Id Range

The Match Alarms by Date Range pane contains the following fields:

Field or Button	Description
Clear	Click this icon to clear the alarm IDs and enable match by date section.
Start Alarm Id	The start alarm ID to forward the traps.
End Alarm Id	The end alarm ID to forward the traps.

Search Tools

Note You must have HA (for Home Agent subscriber tool) or GGSN, PDNGW, SGW, or SPGW (for APN Subscriber tool) networks enabled to use this tool (for details on enabling HA, see mwtm manage, page B-47).

The Search pane provides a tool that you use to search for a specific subscriber across one or more designated Cisco Home Agent (HA) routers or to search for GGSN, PDNGW, and SGW subscribers. These tools are useful for troubleshooting problems that subscribers might report.

In the Search pane, click one of the following options:

- **Search for Home Agent Subscriber** (See Searching for Home Agent Subscribers, page 11-29)
- **Search for APN Subscriber** (See Searching for APN Subscribers, page 11-29)

Searching for Home Agent Subscribers

Step 1 Click **Tools** in the navigation tree of the MWTM web interface, then select **Search for Home Agent Subscriber**.

Step 2 Click the Identifier Type radio button:

- **Network Access Identifier**—Use this option if you know the subscriber's network access identifier (NAI); for example, jdoe@xyz.com.
- **IP Address**—Use this option if you know the subscriber's IP address

Step 3 Depending on your selection in Step 2, enter the subscriber's NAI or IP address in the Mobile Node Identifier field.

Step 4 In the Select Groups to Search pane, click on the group(s) for which you want to search for Home Agents. This field is only available if you have previously created an HA config, HA report, or General group. (See Creating Device Groups, page 11-30).

Step 5 In the Select Home Agents to Search pane, check the check boxes of the Home Agents that you want to search. (The default setting is all Home Agents.) Click **Select All** to check all boxes and search all Home Agents. Click **Deselect All** to clear all check boxes.

Step 6 To conduct the search, click the **Search** button.

The Search Results popup window appears.

Step 7 If the search successfully locates the subscriber, and you want to troubleshoot the problem, click the **Troubleshoot Subscriber** button in the Search Results popup.

The MWTM automatically navigates to the Troubleshooting tab of the HA device.

Step 8 For more information about troubleshooting devices by using the Troubleshooting tab, see Viewing Troubleshoot, page 7-40.

Searching for APN Subscribers

Step 1 Click **Tools** in the navigation tree of the MWTM web interface, then click **Search for APN Subscriber**.

Step 2 In the MSISDN field, enter the MSISDN for which you want to search.

Step 3 In the Select Groups to Search pane, click on the group(s) for which you want to search for GGSN, PDNGW, SGW, or SPGW subscribers. This field is only available if you have previously created a GGSN config, GGSN report, PDNGW config, PDNGW report, SGW config, SGW report, SPGW config, SPGW report, or General group. (See Creating Device Groups, page 11-30).

Step 4 In the Select Nodes to Search field, select all the Nodes on which you want to search for the MSISDN you entered. Click **Select All** to check all boxes and search all the nodes. Click **Deselect All** to clear all check boxes.

Step 5 To conduct the search, click the **Search** button.

The Search Results popup window appears.

Step 6 If the search is successful, you can select from the matching nodes to troubleshoot the subscriber by clicking the **Troubleshoot Subscriber** button in the Search Results popup.

Understanding Device Groups

MWTM allows you to create *device groups* of nodes that can simplify operations. You can create device groups using the MWTM web interface and then perform operations against all nodes of a group instead of performing the operation against each node individually. You can also perform searches on device groups. For example, you can search for a home agent subscriber on nodes within a specific device group.

For provisioning device groups, the *master node* is the first node in the group. The master node is used to determine provisioning commands.

Related Topics

- Creating Device Groups, page 11-30
- Editing Device Groups, page 11-32
- Viewing Device Group Summary Information, page 11-32

Creating Device Groups

Note This option is available to users with authentication level Network Administrator (level 4) and System Administrator (level 5)

You can create the following types of device groups:

Step 1 From the web interface, click **Device Groups**.

Step 2 Click the Create icon. The New Group form appears.

Step 3 Complete the New Group fields:

Field	Description
Name	Enter a name for the device group
Type	From the pulldown menu, select the device group type: CSG2 configuration CSG2 report GGSN configuration GGSN report General—Any node can be in the general device group. HA configuration HA report IPRAN configuration RAN-O configuration PDNGW configuration PDNGW report SGW configuration SGW report SPGW configuration SPGW report PDSN configuration PDSN report mSEF configuration

Note If a group contains non-existent nodes or if you add a node of the wrong type to a group, the group will be invalid.

Step 4 Click **OK**.

The Edit window appears displaying information about the group you just created. See Viewing Device Group Summary Information, page 11-32 for more information.

Related Topics

- Understanding Device Groups, page 11-30
- Editing Device Groups, page 11-32
- Viewing Device Group Summary Information, page 11-32

Editing Device Groups

After you have created a device group, you can add nodes to and remove nodes from the device group. You can also order the nodes within the device group.

Note This option is available to users with authentication level Network Administrator (level 4) and System Administrator (level 5). If you do not have the required privileges you will not see the Edit tab.

Step 1 From the web interface, click **Device Groups > *device group name***.

Step 2 Click the **Edit** tab. The Device Group Settings pane displays the device group name and device group type.

Step 3 In the Device Group Members pane, specify to display available members by **Nodes** or by **Device Groups**. You might want to view members by Device Group if you want to copy all members of one device group to another device group. The available members or device groups are displayed.

Note Only valid nodes for a device group are displayed in the Available members/groups list. A device group is invalid if it contains non-existent nodes or if the device group contains nodes of the wrong type.

Step 4 Click on a member or device group to add to the specified device group, then click **Add**. The member or device group is added to the Selected Members list.

Step 5 To remove a member, click on the member in the Selected Members list, then click **Remove**.

Step 6 To order the nodes in a device group, use the **Raise** and **Lower** buttons.

For provisioning device groups, the *master node* is the first node in the device group. The master node is used to determine provisioning commands.

Viewing Device Group Summary Information

From the web interface navigation tree, click **Device Groups** to display the Device Group Summary List.

Note Some table columns are hidden by default. Right-click on the web table header to see all columns.

Field	Description
Internal ID	Internal ID of the object. The internal ID is a unique ID for every object, which the MWTM assigns for its own internal use. This ID can also be useful when the TAC is debugging problems.
Name	Name of the group.
Group Type	Type of group.
Size	Number of nodes in the group.
Notes	Displays any notes attached to the group.

Field	Description
Valid	**Yes** indicates the group is valid. **No** indicates the group is not valid. A group is invalid if it contains non-existent nodes or if the group contains nodes of the wrong type.
Create Time	The time at which the group was created.
Last Updated	Date and time the MWTM last updated the information on the page.
Create User	The IP address from which the group was created.
Last Changed User	Displays the local IP Address.
Last Verified	Time and date group was last verified.

Displaying Device Group Details

Step 1 From the web interface, click **Device Groups > *device group name***. You can click on any of the following tabs for more information about the specified group:

Details—See Viewing Device Group Details, page 11-33.

Notes—See Viewing Notes, page 8-55.

Events—Displays events associated with the nodes in the group only. See Displaying Alarms and Events, page 11-19.

Alarms—Displays alarms associated with the nodes in the group only. See Displaying Alarms and Events, page 11-19.

Edit—See Editing Device Groups, page 11-32.

Viewing Device Group Details

Step 1 From the web interface, click **Device Groups >device *group name***.

Step 2 Click **Details**. Detailed information about the specified device group is displayed. See Nodes Table, page 8-8 for descriptions of the fields.

The Device Group Member Verification Status field specifies that status of each device group member as it exists in the device group. If the device group is not valid, this field indicates which node is causing the device group to not be valid.

Batch Provisioning

The MWTM provides a popup text field where you can type any CLI commands and then have those stored in a file on the server. These commands can then be used in batch operations to push out config changes to the nodes where there is no direct support in the wizard GUI interface. Also, MWTM stores some sample batch config files in the path */opt/CSCOsgm/etc/batch* that gives you an example how these work.

Note You can not delete the sample batch config files and also you can not create a batch file with the name starting with "SampleConfig" through batch file editor.

The MWTM uses the existing "Groups" feature to create group objects. Once you have a group to provision (see Using the Provisioning Wizard, page 7-51), select the group from left panel and then choose **Actions > Batch Provision** from the toolbar. The page gets loaded with the Batch Provision page.

Note The Batch Provision option is available only for the users with authentication level 3 and above. Also, the Batch Provision is not available for a group of the type "Report".

The Batch Provision page contains:

Field or Button	Description
Back	Use this button to go back to the previous page.
Load File	Opens the MWTM: File Dialog window, which allows you to load the batch files.
Save File	Saves the changes you have made to the chosen batch file. The saved batch files are added in the path */opt/CSCOsgm/etc/batch* with the naming convention "$*Name*.99.9(99).Generic.batch". **Note** When you load the sample batch config files, the Save File button gets disabled.
Save As	Click this to save the updated batch file with a new name, or to overwrite an existing batch file. Opens the MWTM: File Dialog window with the addition of a text field "Filename" where you can specify the new name for the batch file. If an existing file name is given in the "File Name" text field, a confirmation dialog box is displayed asking whether to overwrite the existing file. The saved batch files are added in the path */opt/CSCOsgm/etc/batch* with the naming convention "$*Name*.99.9(99).Generic.batch".
Write Mem	Click this check box to save the script to the running configuration.
Provision	Allows you to perform batch provisioning for the nodes in the selected group. Opens Add credential for all nodes in the group window.
Batch File	Text area to display or edit the contents of the batch file. This text area is empty and the title displays "Batch File: No File" when there is no batch file loaded. Once the batch files are loaded (using the Load File option), the text area displays the contents of the loaded batch file and the title of the text area changes to Batch File: *filename,* where *filename* is the name of the batch file. You can also enter the device level commands in this text area to provision the nodes in the selected group.

MWTM: File Dialog

The MWTM: File Dialog window contains:

Field or Button	Description
Batch File List	The Batch File List pane contains the following columns: • Type—Icon indicating the item in the table is a file. • Name—Name of the batch file. • Node Type—Type of node. See Nodes Table, page 8-8, for a list of the available node types. • Last Modified—Date and time the batch file or folder was last modified. • Size (bytes)—Size of the batch file or folder, in bytes.
OK	Loads the chosen batch file and closes the dialog box. To load a batch file, select the file in the list and click **OK**. The batch file is loaded properly in the "Batch File:" text area panel of the "Batch Provision" page.
Delete	Deletes the chosen file from the batch file list. The MWTM displays a confirmation message before deleting the file.
Cancel	Closes the dialog box without loading a batch file or saving any changes to the batch file list.
Help	Displays online help for the dialog box.

Add credential for all nodes in the group

The Add credential for all nodes in the group window contains:

Field or Button	Description
User Name	Enter the login username.
Password	Enter the login password.
Enable User Name	Enter the login enable username.
Enable Password	Enter the login enable password.
OK	Adds the new credential information to the MWTM database.
Cancel	Closes the current window without saving the changes.
Help	Displays the online help for the window.

Batch Troubleshooting

Note If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Operator (level 3) and higher.

You can perform troubleshooting for a group of nodes by:

1. Select a device group created under **Groups** -> **Device Group** in the navigation tree.
2. Clicking the Batch Troubleshoot menu option from the Actions menu in the right pane.

Note The Batch Troubleshoot menu option is not available if the device group doesn't contain any nodes.

Tip To save the output of all executed commands to a log file, see mwtm tshootlog, page B-94.

Before you can run commands and view output, credentials must be properly configured. You can configure credentials using the CLI command (see mwtm addcreds, page B-7) or through the MWTM client (see Configuring Login Credentials, page 5-19). If credentials are not configured, the message "No access credentials available" appears in the output pane of that Node.

The right pane for the Troubleshooting table shows these fields and toolbar buttons for the chosen device group:

Field or Toolbar Button	Description
Group Name (in heading)	Name as created in Device Group.
Server Name (in heading)	Name of the MWTM server associated with the node.
Category	Related commands are grouped together in categories. Some categories are provided by default and cannot be modified. Additional categories are user-defined.
Command	List of commands or tasks associated with the chosen category. A chosen command can be executed using the **Execute Command** button.
Suffix	Filters the output of troubleshooting commands. For example: • include—Includes the lines matching the specified regular expression. • exclude—Excludes the lines matching the specified regular expression. • begin—Starts the printout at the line matching a regular expression. • section—Outputs only the matching sections of the printout. **Note** The suffixes allowed here are those supported by the IOS version.
Back	Displays the previous screen.
 Execute Command	Executes the chosen command only.
 Cancel Execution	Stops any execution process.

Field or Toolbar Button	Description
 Clear Output	Clears all output from the screen.
Output Pane	Pane at bottom where command output appears.

Understanding User Groups

MWTM allows you to create a *user group* and to assign the existing device groups to the created *user group*. Each *user group* can be assigned more than one device group. While creating *user groups,* if the users are created and the user access is enabled, then the created users can be assigned to the user group.

The logged in user is part of user group is able to see only the member of the device group under **Group-Device Group** and **User Group > Device Groups > <Nodes>** under DEFAULT View. If the useraccess is enabled and usergroup created then the Network Administrator (level 4) and System Administrator (level 5) are able to see the **User Groups** under DEFAULT View along with the discovered node. The logged in user is not part of user group is able to see all the discovered nodes under DEFAULT View.

Related Topics

- Creating User Groups, page 11-37
- Editing User Groups, page 11-38
- Viewing User Group Summary Information, page 11-39

Creating User Groups

Note This option is available to users with authentication level System Administrator (level 5) and Network Administrator (level 4).

You can create the following types of device groups:

Step 1 From the web interface, click **User Groups**.

Step 2 Click the Create icon. The New User Group form appears.

Step 3 Complete the New User Group fields:

Field	Description
Name	Enter a name for the user group
Region	The region

Step 4 Click **OK**.

The Edit window appears displaying information about the group you just created. See Editing User Groups, page 11-38 for more information.

Note By default, the User Group will be added under DEFAULT View.

Related Topics

- Understanding User Groups, page 11-37
- Editing User Groups, page 11-38
- Viewing User Group Summary Information, page 11-39

Editing User Groups

After you have created a user group, you can add device groups as well as users other than level 4 and level 5 to the user group. You can also order the device group members and user members within the user group.

Note This option is available to users with authentication level Network Administrator (level 4) and System Administrator (level 5). If you do not have the required privileges, the Edit tab will not be available.

Step 1 From the web interface, click **User Groups >** ***user group name***.

Step 2 Click the **Edit** tab. The User Group Settings pane displays the user group name and region.

Step 3 In the User Group Members: Device Group pane, specify to display available device group members.

Note Only the device group with Config type and General type will be displayed in the above pane.

Step 4 In the User Group Members: Users pane, specify to display the user except level 4 and level 5 users.

Note Restrain from adding Custom-Level users to any User Group if the Custom-Level user has permission to edit groups.

Step 5 Click on a device group or user member to add to the specified user group, then click **Add**. The device group or user member is added to the Selected Members list.

Step 6 To remove a member, click on the member in the Selected Members list, then click **Remove**.

Step 7 To order the members in a user group, use the **Raise** and **Lower** buttons.

Note While adding or removing the members from the user group, the corresponding members will be removed from the user group node under the default view.

Note While changing the user group through level 4 or level 5 users, forced log out will happen if the logged in user is part of the user group and the session is active.

Viewing User Group Summary Information

From the web interface navigation tree, click **User Groups** to display the User Group Summary List.

Note Some table columns are hidden by default. Right-click on the web table header to see all columns.

Field	Description
Internal ID	Internal ID of the object. The internal ID is a unique ID for every object, which the MWTM assigns for its own internal use. This ID can also be useful when the TAC is debugging problems.
Name	Name of the user group.
Number of Device Groups	Total number of device group members. On clicking the hyper link will show the device group members in a dialog.
Number of Users	Total number of user members. On clicking the hyperlink will show the user members in a dialog.

Displaying User Group Details

Step 1 From the web interface, click **User Groups > *user group name***. You can click on any of the following tabs for more information about the specified group:

Details—See Viewing User Group Details, page 11-39.

Edit—See Editing User Groups, page 11-38.

Viewing User Group Details

Step 1 From the web interface, click **User Groups >user *group name***.

Step 2 Click **Details**. Detailed information about the specified user group is displayed.

Field	Description
Name	Name of the user group.
Region	Name of the region
Valid	Is it Valid or not

Field	Description
Created	The created time stamp of user group
Last Updated	The last updated time stamp of user group
Create User	Specify the user who created
Last Updated User	Specify the user who last updated
Last Verified	The last verified time stamp
Device Group Members	The device group members
User Group Members	The user members

If the device group or user which is part of User Group got deleted then it will display the particular device group as does not exist and User does not exist in the Device Group Members and User Group Members list.

Viewing Statistics

You can use statistics for capacity planning and trend analysis. For example, you can generate graphs, tables, or CSV files:

- For a specified time range to display historical statistics for customer busy-hours.
- To show the maximum send and receive traffic over a specified time period.
- To show data on a 15-minute, daily, or hourly basis.

MWTM provides two types of statistics:

- **Real-time statistics**—The MWTM provides real-time (not historical) performance statistics and error information occurring in real time. The MWTM client also displays graphs for real-time statistics. You use real-time statistics for troubleshooting active problem areas in your network.
- **Historical reports (statistics)**. These reports are available on the MWTM web interface only.

  These statistics vary by the time frame over which they are collected and stored and for some domains, the statistics gathered vary. For example, real-time SCTP Association Statistic Details describes link-level SCTP statistics collected every 15 seconds. The SCTP historical reports describe device-level SCTP statistics for all of the SCTP links on a specific device over 15 minute, hourly, and daily intervals.

Displaying RAN-O Statistics

You can view real-time performance data for a shorthaul or backhaul interface in the MWTM:

- Web interface by selecting a shorthaul or backhaul interface in the navigation tree and clicking the Shorthaul Performance or Performance tab in the right pane.
- Client interface by right-clicking a shorthaul or backhaul interface in the navigation tree and clicking Performance History. The MWTM client interface provides access to RAN-O real-time performance statistics that you can use to troubleshoot problems that occur in real time. The zoom and navigation features quickly enable isolating and focusing on a problem area.

Note If the CISCO-IP-RAN-BACKHAUL-MIB on the node is not compliant with the MWTM, the MWTM issues the message:

```
MIB not compliant for reports
```

Install a version of IOS software on the node that is compatible with the MWTM. For a list of compatible IOS software, from the MWTM:

- Web interface, choose **Administrative > IPRAN OS README**.
- Client interface, choose **View > MWTM Web Links > Administrative**; then click **IPRAN OS README**.

The Performance tab shows one or more graphs depending on the type of report chosen. These graphs depict send and receive rates of optimized IP traffic over a specified time range. The graphs display the traffic in bits per second. Each data series shows maximum, minimum, and average rates of optimized traffic.

The Performance tab for a backhaul interface shows total rates for GSM and UMTS traffic, including total error rates.

This section provides information about:

- Displaying Shorthaul Performance Statistics, page 11-41
- Displaying Backhaul Performance Statistics, page 11-42

Displaying Shorthaul Performance Statistics

The Shorthaul Performance tab for a shorthaul interface shows the maximum, minimum, and average rates for send and receive traffic.

The Shorthaul Performance tab for a shorthaul interface contains:

GUI Element	Description
Toolbar	Provides functions to select a report type, duration, output type. See Using the Toolbar, page 11-6.
Type	A comprehensive summary of minimum, average, and maximum capacity statistics for send and receive traffic on a RAN shorthaul. You can choose from 15-minute, hourly, or daily capacity summary reports, or choose a custom range.
Table	If you select the Output Type Table, the table contains: • Data Type—Type of data, send or receive • Average—Average of the data across the chosen time range • Minimum—Minimum value across the chosen time range • Minimum Timestamp EDT—Time the minimum value occurred • Maximum—Maximum value across the chosen time range • Maximum Timestamp EDT—Time the maximum value occurred **Note** If the Output Type is Table or CSV, the same data is presented but the column headings are labeled by data type (for example, Send Average and Receive Average).

GUI Element	Description
Expand to Full Screen	If Output Type is Graph, this text link displays the graph in a new, full-screen window for easier viewing.
Bits/Sec or Bytes/Sec	If Output Type is Graph, Y-axis label that shows traffic rate in bits per second. The Y axis automatically scales to the interface speed. **Note** If no data exists between any two data points, the graph displays a color-coded vertical bar to show the period for which no data is available.
Time	If Output Type is Graph, X-axis label that shows a historical time scale and the server time zone.
Legend	If Output Type is Graph, color-coded legend that shows labels for traffic rates.

Displaying Backhaul Performance Statistics

The Performance tab for a backhaul interface shows minimum, average, and maximum traffic rates for send and receive traffic. You can also determine the percentage of backhaul utilization that various traffic types occupy. Error rates appear, too.

The Performance tab for a backhaul interface contains:

GUI Elements	Description
Toolbar	Provides functions to select a report type, duration, output type, and the Graph Series Editor. See the "Using the Toolbar" section on page 11-6.
Type	Report Type. If you choose a Capacity Summary report, the report shows a comprehensive summary of minimum, average, and maximum capacity statistics for total traffic (GSM-Abis and UMTS-Iub), total GSM-Abis traffic, and total UMTS-Iub traffic. You can choose from 15-minute, hourly, or daily capacity summary reports. Error rates appear, too. If Output Type is Graph, statistics appear in these graphs: • Top—Capacity statistics for send traffic rates, including percentage of backhaul utilization (right side of graph). • Middle—Capacity statistics for receive traffic rates, including percentage of backhaul utilization (right side of graph). • Bottom—Error counts for send and receive traffic.
Type (continued)	If you choose a Minimum, Average, or Maximum Capacity report, the tables and graphs show capacity statistics for the backhaul interface. You can choose from 15-minute, hourly, or daily capacity reports. If Output Type is Graph, send and receive rate statistics appear in separate panes. Each pane shows two fully expandable graphs: • Top—Shows total (GSM-Abis and UMTS-Iub), total GSM-Abis, and total UMTS-Iub traffic rates, including percentage of backhaul utilization (right side of graph). • Bottom—Shows traffic rates for each shorthaul interface that belongs to the backhaul.

GUI Elements	Description
Table	**Note** Different tables appear depending on the report Type and Output Type selections. If the Output Type is Graph, a table appears with these columns: • Data Type—Type of data, send or received • Average—Average of the data across the chosen time range • Minimum—Minimum value across the chosen time range • Minimum Timestamp EDT—Time the minimum value occurred • Maximum—Maximum value across the chosen time range • Maximum Timestamp EDT—Time the maximum value occurred **Note** If the Output Type is Table or CSV, similar data is presented but the column headings may vary. Also, if the value is N/A, that means no data is available. Another table has these columns: • Data Type—Category of error for which statistics are gathered. Types include optimization, missed packets, and miscellaneous errors. • Total Counts—Total error count for each type of error. • Avg. Error Rate (Per Sec)—The calculated average error rate per second for each error type over the duration of the data range that you chose. **Note** You can sort the contents of the columns in ascending or descending order by clicking the column heading.
Expand to Full Screen	If Output Type is Graph, text link that shows a graph in a new, full-screen window for easier viewing.
Bits/Sec or Bytes/Sec	If Output Type is Graph, primary Y-axis label (left side of graph) that shows traffic rate in bits per second. The Y axis automatically scales to the User Bandwidth. If no data exists between any two data points, the graph displays a color-coded vertical bar to show the period for which no data is available.
% Utilization	If Output Type is Graph, secondary Y-axis label (right side of graph) that shows the backhaul utilization as a percentage of the User Bandwidth. The graph background has horizontal bars that are color-coded to indicate these thresholds: • Overloaded—Top portion of graph. • Warning—Middle portion of graph. • Acceptable—Bottom portion of graph. For definitions of these thresholds, see the "Threshold Information (RAN-O Only)" section on page 7-36. **Note** If the% Utilization exceeds 100%, see Why does my backhaul graph show greater than 100% for transmit traffic?, page C-24.
Time	X-axis label that shows a user-specified, historical time scale and the server time zone.
Legend	Color-coded legend that shows labels for traffic and error rates.

Displaying Error Statistics

You can view error data for a shorthaul or backhaul interface in the MWTM:

- Web interface by selecting an interface in the navigation tree and clicking the Shorthaul Errors or Errors tab in the content area.
- Client by right-clicking an interface in the navigation tree and clicking **Error History**.

Note If the CISCO-IP-RAN-BACKHAUL-MIB on the node is not compliant with the MWTM, the MWTM issues the message:

```
MIB not compliant for reports
```

Install a version of IOS software on the node that is compatible with the MWTM. For a list of compatible IOS software, from the MWTM:

- Web interface, choose **Administrative > IPRAN OS README**.
- Client interface, choose **View > MWTM Web Links > Administrative**; then click **IPRAN OS README**.

You view error data for a shorthaul or backhaul interface by selecting the interface in the navigation tree and clicking the Errors tab in the content area. The Errors tab shows total error counts and average error rates in table and graph format.

This section provides information about:

- Displaying Shorthaul Error Statistics, page 11-44
- Displaying Backhaul Error Statistics, page 11-45

Displaying Shorthaul Error Statistics

The Shorthaul Errors tab for a shorthaul interface shows a single table and a graph that shows the error rates and counts for different types of GSM-Abis and UMTS-Iub errors.

The Shorthaul Errors tab for a shorthaul interface contains:

GUI Elements	Description
Toolbar	Provides functions to select report type, duration, and output type. See the "Using the Toolbar" section on page 11-6.
Type	Report Type. If you choose an Error Summary report, the table and graph display a comprehensive summary of total error counts and average error rates for protocol, missed-packet, and miscellaneous errors for the chosen shorthaul. You can choose from 15-minute, hourly, or daily error summary reports. Statistics appear in table and graph format. If you choose an error report that is not a summary report, the table and graph displays protocol, missed packet, or miscellaneous errors for the shorthaul interface. You can choose from 15-minute, hourly, or daily error reports. Statistics appear in table and graph format. For definitions of these error types, see: • Protocol Failures, page 7-118 • Miscellaneous, page 7-119 • Missed Packets, page 7-120

GUI Elements	Description
Table	**Note** Different tables and column headings appear depending on the report Type and Output Type selections. If Output Type is Graph, a table appears with these columns: • Data Type—Category of error for which statistics are gathered. Types include protocol, missed packets, and miscellaneous errors. • Total Counts—Total error count for each type of error. • Avg. Error Rate (Per Sec)—The calculated average error rate per second for each error type over the duration of the data range that you chose. **Note** If the value is N/A, that means no data is available. Depending on the report Type selection, if the Output Type is Table or CSV, a table appears with multiple columns showing various error types and their counts. For definitions of these error types, see the: • Protocol Failures, page 7-118 • Miscellaneous, page 7-119 • Missed Packets, page 7-120 **Note** You can sort the contents of the columns in ascending or descending order by clicking the column heading.
Expand to Full Screen	If Output Type is Graph, this text link displays a graph in a new, full-screen window for easier viewing.
Error Counts	If Output Type is Graph, Y-axis label on left side of graph that shows traffic rate in bits per second. **Note** If no data exists between any two data points, the graph displays a color-coded vertical bar to show the period for which no data is available.
Time	If Output Type is Graph, X-axis label that shows a user-specified, historical time scale and the server time zone.
Legend	If Output Type is Graph, color-coded legend that shows labels for traffic and error rates.

Displaying Backhaul Error Statistics

The Errors tab for a RAN backhaul interface shows a single table and a graph that shows the error rates and counts for different interfaces belonging to the backhaul.

The Errors tab for a backhaul interface contains:

GUI Elements	Description
Toolbar	Provides functions to select a report type, duration, output type, and the Graph Series Editor. See the "Using the Toolbar" section on page 11-6.
Table	**Note** Different tables and column headings appear depending on the report Type and Output Type selections. If Output Type is Graph, a table appears with these columns: • Data Type—Category of error for which statistics are gathered. Types include optimization, missed packets, and miscellaneous errors. • Total Counts—Total error count for each type of error. • Avg. Error Rate (Per Sec)—The calculated average error rate per second for each error type over the duration of the data range that you chose. **Note** If the value is N/A, that means no data is available. If Output Type is Table, a table appears with columns for total error counts for various error types (for example, total GSM-Abis errors). **Note** You can sort the contents of the columns in ascending or descending order by clicking the column heading.
Expand to Full Screen	If Output Type is Graph, text link that shows a graph in a new, full-screen window for easier viewing.
Error Counts	If Output Type is Graph, Y-axis label on left side of graph that shows traffic rate in bits per second.
Time	If Output Type is Graph, X-axis label that shows a user-specified, historical time scale and the server time zone.
Legend	If Output Type is Graph, color-coded legend that shows labels for traffic and error rates (for example, Total Errors UMTS-Iub).

Generating RAN Data Export Files

You can easily generate historical reports for RAN backhauls and shorthauls in the web interface. You can then export this data to a report with comma-separated values (CSV file). You can save this file to disk or open it with an application that you choose (for example, Microsoft Excel).

To export RAN data:

Step 1 Select a RAN backhaul or shorthaul in the navigation tree of the web interface.

Step 2 Click the Performance or Errors tab in the right pane.

Step 3 Generate a report.

Step 4 Choose CSV from the Type drop-down menu.

Displaying CSG2 Real-Time Statistics

The MWTM enables you to display real-time statistics for CSG2 nodes in the MWTM web interface. To display real-time statistics, select the node in the navigation tree and click the Statistics tab. The following options appear under the Type drop-down menu:

- Global Statistics, page 11-47
- CSG2 Protocol, page 11-53
- Gx Global Statistics, page 11-54
- Gx Policy Preload, page 11-55
- Gx Policy Preload Ext, page 11-57
- Gx PCRF Method List Message, page 11-59
- Gx PCRF Method List Message Error, page 11-60
- Billing Plan Statistics, page 11-61

Global Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Global Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

- Global Statistics, page 11-48
- Load Statistics, page 11-49
- BMA Statistics, page 11-50
- Quota Server Statistics, page 11-51
- User Database Statistics, page 11-52

Global Statistics

The Global Statistics pane contains:

Field	Description
User Current	The total number of users with one or more active sessions on the system.
Session Current	The total number of sessions on the system. A session corresponds to a transmission control protocol (TCP) or user datagram protocol (UDP) flow.
User High Water	The highest number of active users reported by the User Current field since its last reset.
Session High Water	The highest number of active sessions reported by the Session Current field since its last reset.
User License	Number of users allowed by the license.
The following statistics are available only on CSG2, Release 2, for devices running IOS 12.4(15) or later.	
GTP BMA Rejected	Number of messages received from all the Billing Mediation Agents (BMAs) with reject cause code.
GTP BMA Dropped	Total number of messages dropped destined for any of the BMAs
GTP BMA Retransmit	Number of messages retransmitted to all BMAs.
GTP QuotaMgr Rejected	Number of messages received from all the Quota Managers with reject cause code.
GTP QuotaMgr Dropped	Total number of messages dropped destined for any of the Quota Managers.
GTP QuotaMgr Retransmit	Number of messages retransmitted to all the Quota Managers.
The following statistics are available only on CSG2, Release 7, for devices running IOS 12.4(15) or later.	
Gx Rule Activation Failure	Number of Gx rule activation failures.
Gx Rule Deactivation Failure	Number of Gx rule deactivation failures.
Gx Revalidation Success	Number of Gx revalidation successes.
Gx Revalidation Failure	Number of Gx revalidation failures.

Load Statistics

Load statistics are available only on CSG2, Release 2, for devices running IOS 12.4(15) or later.

The Load Statistics pane contains:

		Description
Statistics Type	**Column**	Defines the type of statistics for each row: • Radius Start Requests • Session Create Requests • BMA Messages • Messages to Quota Server • User Database Requests • Gx Events *(available only on CSG2, Release 3.5, for devices running 12.4(22)MDA1 or later)*
Radius Start Requests	Allowed	Number of outgoing Radius Start requests allowed.
	Allowed Rate	Number of outgoing Radius Start requests allowed per second.
	Allowed Peak	The highest number of outgoing Radius Start requests allowed per second.
	IPC Queue Depth Tolerance	Maximum queue depth for Radius Start requests in the (Inter Processor Communication) IPC queue.
	Denied	Number of outgoing Radius Start requests denied.
	Denied Rate	Number of outgoing Radius Start requests denied per second.
	Denied Peak	The highest number of outgoing Radius Start requests denied per second.
Session Create Requests	Allowed	Number of outgoing Session Create Requests allowed.
	Allowed Rate	Number of outgoing Session Create Requests allowed per second.
	Allowed Peak	The highest number of outgoing Session Create Requests allowed per second.
	IPC Queue Depth Tolerance	Maximum queue depth for Session Create Requests in the IPC queue.
	Denied	Number of outgoing Session Create Requests denied.
	Denied Rate	Number of outgoing Session Create Requests denied per second.
	Denied Peak	The highest number of outgoing Session Create Requests denied per second.
BMA Messages	Allowed	Number of outgoing BMA messages allowed.
	Allowed Rate	Number of outgoing BMA messages allowed per second.
	Allowed Peak	The highest number of outgoing BMA messages allowed per second.
	IPC Queue Depth Tolerance	Maximum queue depth for BMA messages in the IPC queue.
	Denied	Number of outgoing BMA messages denied.
	Denied Rate	Number of outgoing BMA messages denied per second.
	Denied Peak	The highest number of outgoing BMA messages denied per second.

		Description
Messages to Quota Server	Allowed	Number of outgoing messages to Quota Manager allowed.
	Allowed Rate	Number of outgoing messages to Quota Manager allowed per second.
	Allowed Peak	The highest number of outgoing messages to Quota Manager allowed per second.
	IPC Queue Depth Tolerance	Maximum queue depth for messages to Quota Manager in the IPC queue.
	Denied	Number of outgoing messages to Quota Manager denied.
	Denied Rate	Number of outgoing messages to Quota Manager denied per second.
	Denied Peak	The highest number of outgoing messages to Quota Manager denied per second.
User Database Requests	Allowed	Number of outgoing User Database requests allowed.
	Allowed Rate	Number of outgoing User Database requests allowed per second.
	Allowed Peak	The highest number of outgoing User Database requests allowed per second.
	IPC Queue Depth Tolerance	Maximum queue depth for User Database requests in the IPC queue.
	Denied	Number of outgoing User Database requests denied.
	Denied Rate	Number of outgoing User Database requests denied per second.
	Denied Peak	The highest number of outgoing User Database requests denied per second.
Gx Events *(available only on CSG2, Release 3.5, for devices running 12.4(22)MDA1 or later)*	Allowed	Number of outgoing Gx Events allowed.
	Allowed Rate	Number of outgoing Gx Events allowed per second.
	Allowed Peak	The highest number of outgoing Gx Events allowed per second.
	IPC Queue Depth Tolerance	Maximum queue depth for Gx Events in the IPC queue.
	Denied	Number of outgoing Gx Events denied.
	Denied Rate	Number of outgoing Gx Events denied per second.
	Denied Peak	The highest number of outgoing Gx Events denied per second.

BMA Statistics

The Billing Mediation Agent (BMA) Statistics pane contains:

Column	Description
Server	Name of the BMA server.
Port	The UDP port of the BMA.
VRF Name	Name of the virtual routing and forwarding (VRF) over which communication with BMA occurs. If no VRF is specified, the global routing table is used.

Column	Description
State	The state of the BMA. Possible states include: Standby—The server is prepared to become active. Failed—The server has failed to respond to requests. Active—The server has been activated to receive requests. Echowait—An echo request to this billing mediation agent is waiting for a response. Nawait—A node-alive request to this billing mediation agent is waiting for a response. Suspended—The server has received a stop request from the operator.
Lost Records	Total number of lost records since system initialization or the last time the counter wrapped.
Total Sent	Total number of records sent to the billing mediation agent.
Failed Acks	Number of acknowledgments received from the billing mediation agent for which there are no outstanding requests.
Outstanding	Current number of messages waiting to be acknowledged. An arrow icon indicates the trend (up or down) since the last poll.
Outstanding High Water	The highest number of messages waiting for acknowledgements as reported by the Outstanding field since its last reset.
Bad Records	Number of bad records received. These are records in which an error was detected while attempting to decode the contents.
Retransmits	Number of messages retransmitted to the billing mediation agent.
Sent Rate	Rate at which records are sent to the billing mediation agent.
The following statistics are available only on CSG2, Release 2, for devices running IOS 12.4(15) or later.	
Rate Interval	The duration of time interval in Packet Rate and Ack Rate.
Packet Rate	Number of packets sent to the BMA per second calculated over the interval indicated by Rate Interval.
Ack Rate	Number of acknowledgments received from the BMA per second calculated over the interval indicated by Rate Interval.

Quota Server Statistics

The Quota Server Statistics pane contains:

Column	Description
Server	Name of the quota server.
Port	The UDP port of the quota server.
VRF Name	Name of the Virtual Routing and Forwarding (VRF) over which communication with the quota server occurs. If no VRF is specified, the global routing table is used.

Column	Description
State	The state of the quota manager. Possible states include: • Standby—The quota manager is prepared to become active. • Failed—The quota manager has failed to respond to requests. • Active—The quota manager has been activated to receive requests. • Echowait—An echo request to this quota manager is waiting for a response. • Nawait—A node-alive request to this quota manager is waiting for a response. • Suspended—The quota manager has received a stop request from the operator.
Lost Records	Total number of lost records since system initialization or the last time the counter wrapped.
Total Sent	Total number of records sent to the quota server.
Failed Acks	Number of acknowledgments received from the quota server for which there are no outstanding requests.
Outstanding	Current number of messages waiting to be acknowledged. An arrow icon indicates the trend (up or down) since the last poll.
Outstanding High Water	The highest number of messages waiting for acknowledgements as reported by the Outstanding field since its last reset.
Bad Records	Number of bad records received. These are records in which an error was detected while attempting to decode the contents.
Retransmits	Number of messages retransmitted to the quota manager.
Sent Rate	Rate at which records are sent to the quota server.
The following statistics are available only on CSG2, Release 2, for devices running IOS 12.4(15) or later.	
Rate Interval	The duration of time interval in Packet Rate and Ack Rate.
Packet Rate	Number of packets sent to the Quota Manager per second calculated over the interval indicated by Rate Interval.
Ack Rate	Number of acknowledgments received from the Quota Manager per second calculated over the interval indicated by Rate Interval.

User Database Statistics

The user database is a service that translates a client IP address into a user identifier. The User Database Statistics pane contains:

Column	Description
Server	Name of the user database server.
Port	The listening UDP port of the server.
VRF Name	Name of the VRF over which communication with user data server occurs. If no VRF is specified, the global routing table is used.
State	State of the user database. Possible values include: Reset—State before the database is determined to be active. Active—The database is available and processing requests. Failed—The database has failed and is not processing requests.

Column	Description
Requests	Number of user database requests.
User Identifiers Returned	Number of user identifiers returned.
Requests Resent	Number of user database requests resent.
Request Timeouts	Number of user database requests that have timed out.
Request Errors	Number of errors returned on user database requests.
Requests Rate	Rate of user database requests.
User Identifiers Returned Rate	Rate at which user identifiers are returned.

CSG2 Protocol

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the CSG2 Protocol statistics, choose this option from the Type drop-down menu. The GUI displays:

Column	Description
Inspection Method	Type of inspection method used to identify the protocol.
Protocol	Protocol name used in the configuration of the entity which provides the content services.
Transactions	• Count—Total number of transactions occurred in the network. • Rate—Number of transactions occurred in the network per second. • Peak—The highest number of transactions occurred in the network per second.
Subscriber Send Packets	• Count—Total number of outgoing subscriber packets. • Rate—Number of outgoing subscriber packets per second. • Peak—The highest number of outgoing subscriber packets per second.
Subscriber Send Bits	• Count—Total number of outgoing subscriber bits. • Rate—Number of outgoing subscriber bits per second. • Peak—The highest number of outgoing subscriber bits per second.
Network Send Packets	• Count—Total number of outgoing network packets. • Rate—Number of outgoing network packets per second. • Peak—The highest number of outgoing network packets per second.
Network Send Bits	• Count—Total number of outgoing network bits. • Rate—Number of outgoing network bits per second. • Peak—The highest number of outgoing network bits per second.

Gx Global Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Gx Global statistics, choose this option from the Type drop-down menu. The GUI displays the following categories:

- Global Message Statistics, page 11-54
- Global Message Error Statistics, page 11-55

Global Message Statistics

The Global Message Statistics pane contains:

Column	Description
Active Sessions	Total number of active sessions.
Credit Control Request Initial Messages Sent	Total number of CCR-Initial messages sent.
Credit Control Request Initial Messages Sent Rate	Rate at which CCR-Initial messages are sent.
Credit Control Request Update Messages Sent	Total number of CCR-Update messages sent.
Credit Control Request Update Messages Sent Rate	Rate at which the CCR-Update messages are sent.
Credit Control Request Final Messages Sent	Total number of CCR-Final messages sent.
Credit Control Request Final Messages Sent Rate	Rate at which the CCR-Final messages are sent.
Credit Control Answer Messages Received	Total number of CCA messages received.
Credit Control Answer Messages Received Rate	Rate at which the CCA messages are received.
Reauthorization Request Messages Received	Total number of RAR messages received.

Column	Description
Reauthorization Request Messages Received Rate	Rate at which the RAR messages are sent.
Reauthorization Answer Messages Sent	Total number of RAA messages sent.
Reauthorization Answer Messages Sent Rate	Rate at which the RAA messages are sent.

Global Message Error Statistics

The Global Message Error Statistics pane contains:

Column	Description
Credit Control Response Failures	Number of failures to send CCR.
Invalid Message Type Errors	Total number of invalid message type errors.
Duplicate Request Errors	Total number of duplicate request type errors.
Credit Control Answer Errors	Total number of errors occurred in CCA.
Reauthorization Answer Failures	Number of failures to send RAA.
Reauthorization Response Errors	Total number of errors occurred in RAR.
Invalid Request Type Errors	Number of errors due to invalid request type.
Invalid Request Number Errors	Number of errors due to invalid request number.
Invalid Request Status Errors	Number of errors due to invalid request status.
Invalid Session ID Errors	Number of times the session id received does not exist or when the session id associated with request is not the same as the one received.

Gx Policy Preload

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Gx Policy Preload statistics, choose this option from the Type drop-down menu. The GUI displays the following categories:

Policy Preload Statistics

The Policy Preload Statistics pane contains:

Column	Description
PCEF Initiated Preloading	Number of PCEF initiated preloading.
PCRF Initiated Preloading	Number of PCRF initiated preloading.
Policy Preload Requests	Number of Policy Preload requests.
Policy Preload Responses	Number of Policy Preload responses.
Global Policy Push Count	Number of Global Policy Push.
Global Policy Push Acknowledgement	Number of Global Policy Push Acknowledgement.

Policy Preload Error Statistics

The Policy Preload Error Statistics pane contains:

Column	Description
Preload Data Inconsistent	Number of times the preload data is inconsistent.
Attribute Value Pairs Missing	Number of times the mandatory AVPs (Attribute Value Pairs) are missing.
Wrong Order Failures	Number of failures due to wrong order.
Enforcement Failures	Number of failures to enforce.
Static configuration Conflicts	Number of conflicts with static config.
Credit Control Request Failures	Number of times failed to CCR (Credit Control Request).
Invalid Message Type Errors	Number of invalid message type errors.
Credit Control Answer Errors	Total number of errors occurred in CCA (Credit Control Answer).
Reauthorization Answer Failures	Number of times failed to send RAA (Re-Authorization Answer).

Column	Description
Reauthorization Response Errors	Total number of errors occurred in RAR (Re-Authorization Request).
Invalid Request Type Errors	Number of invalid req-type errors.
Invalid Request Number Errors	Number of invalid req-num errors.
Invalid Request Status Errors	Number of invalid req-status errors.
Invalid Session ID Errors	Number of times the session id received does not exist or when the session id associated with request is not the same as the one received.
Preload Timeout Errors	Number of times the preload timeout occurs.

Gx Policy Preload Ext

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Gx Policy Preload Ext statistics, choose this option from the Type drop-down menu. The GUI displays:

Field or Column	Description
Delete Failed	• Service Contents—Number of times deletion of service contents has failed during preload. • Accounting Policy Maps—Number of times deletion of accounting policy-maps has failed during preload. • Billing Services—Number of times deletion of billing services has failed during preload. • Content Policies—Number of times deletion of content policies has failed during preload. • Billing Plans—Number of times deletion of billing plans has failed during preload.
Deleted	• Service Contents—Number of service contents deleted during preload. • Accounting Policy Maps—Number of accounting policy-maps deleted during preload. • Billing Services—Number of billing services deleted during preload. • Content Policies—Number of content policies deleted during preload. • Billing Plans—Number of billing plans deleted during preload.
Insert Failed	• Service Contents—Number of times insertion of service contents has failed during preload. • Accounting Policy Maps—Number of times insertion of accounting policy-maps has failed during preload. • Billing Services—Number of times insertion of billing services has failed during preload. • Content Policies—Number of times insertion of content policies has failed during preload. • Billing Plans—Number of times insertion of billing plans has failed during preload.
Inserted	• Service Contents—Number of service contents inserted during preload. • Accounting Policy Maps—Number of accounting policy-maps inserted during preload. • Billing Services—Number of billing services inserted during preload. • Content Policies—Number of content policies inserted during preload. • Billing Plans—Number of billing plans inserted during preload.

Field or Column	Description
Roll Back Failed	• Service Contents—Number of times rollback has failed on insertion or deletion of service contents during preload. • Accounting Policy Maps—Number of times rollback has failed on insertion or deletion of accounting policy-maps during preload. • Billing Services—Number of times rollback has failed on insertion or deletion of billing services during preload. • Content Policies—Number of times rollback has failed on insertion or deletion of content policies during preload. • Billing Plans—Number of times rollback has failed on insertion or deletion of billing plans during preload.
Rolled Back	• Service Contents—Number of times the rollback is successful on insertion or deletion of service contents during preload. • Accounting Policy Maps—Number of times the rollback is successful on insertion or deletion of accounting policy-maps during preload. • Billing Services—Number of times the rollback is successful on insertion or deletion of billing services during preload. • Content Policies—Number of times the rollback is successful on insertion or deletion of content policies during preload. • Billing Plans—Number of times the rollback is successful on insertion or deletion of billing plans during preload.

Gx PCRF Method List Message

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Gx PCRF Method List Message statistics, choose this option from the Type drop-down menu. The GUI displays:

Column	Description
Method List Name	Method list name.
Credit Control Request Initial Messages Sent	• Count—Total number of CCR-Initial messages sent. • Rate—Rate at which CCR-Initial messages are sent.
Credit Control Request Update Messages Sent	• Count—Total number of CCR-Update messages sent. • Rate—Rate at which the CCR-Update messages are sent.
Credit Control Request Final Messages Sent	• Count—Total number of CCR-Final messages sent. • Rate—Rate at which the CCR-Final messages are sent.
Credit Control Answer Messages Received	• Count—Total number of CCA messages received. • Rate—Rate at which the CCA messages are received.

Column	Description
Reauthorization Request Messages Received	• Count—Total number of RAR messages received. • Rate—Rate at which the RAR messages are sent.
Reauthorization Answer Messages Sent	• Count—Total number of RAA messages sent. • Rate—Rate at which the RAA messages are sent.

Gx PCRF Method List Message Error

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Gx PCRF Method List Message Error statistics, choose this option from the Type drop-down menu.

The GUI displays:

Column	Description
Method List Name	Method list name.
PCRF Reboots	Number of times PCRF reboots.
Invalid Message Type Errors	Total number of invalid message type errors.
Duplicate Request Errors	Total number of duplicate request type errors.
Credit Control Response Failures	Number of failures to send CCR.
Credit Control Answer Errors	Total number of errors occurred in CCA.
Reauthorization Answer Failures	Number of failures to send RAA.
Reauthorization Response Errors	Total number of errors occurred in RAR.
Invalid Request Type Errors	Number of errors due to invalid request type.
Invalid Request Number Errors	Number of errors due to invalid request number.
Invalid Request Status Errors	Number of errors due to invalid request status.
Invalid Session ID Errors	Number of times the session id received does not exist or when the session id associated with request is not the same as the one received.

Billing Plan Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Billing Plan statistics, choose this option from the Type drop-down menu.

The GUI displays:

Column	Description
Billing Plan Name	Name of the billing plan.
Subscriber Count	Number of subscribers associated with a given Billing Plan.
Peak Subscriber Count	The highest number of subscribers associated with a given Billing Plan.

If the device is not defined with Billing Plan Statistics, then the GUI displays the following error message:

```
Billing Plan Statistics are not defined on the device
```

Displaying BWG Real-Time Statistics

The MWTM enables you to display real-time statistics for Broadband Wireless Gateway (BWG) nodes in the MWTM web interface. To display BWG real-time statistics, select a BWG node in the navigation tree and click the Statistics tab. The following subtabs appear:

- Global, page 11-61
- Paths, page 11-69
- User Groups, page 11-70

Global

The Global subtab shows global statistics for BWG nodes and contains:

- Status, page 11-62
- Creation and Deletion Statistics, page 11-62
- Miscellaneous Statistics, page 11-63
- Signaling Packet Statistics, page 11-64
- DHCP Packet Statistics, page 11-65
- Handoff Statistics, page 11-65
- Data Packet Statistics, page 11-66
- Dropped Packet Statistics, page 11-67
- Profile Statistics, page 11-68
- Rejected Statistics, page 11-69

Note For toolbar details, see Using the Toolbar, page 11-6.

Status

The Status pane shows:

Field	Description
Version	Software version of the BWG.
Description	Description of the physical instance of the BWG.
Operational Status	Current operational state of the BWG.
Session Redundancy Status	Indicates whether session redundancy is enabled or disabled.

Creation and Deletion Statistics

The Creation and Deletion Statistics pane shows:

Field	Description
Base Stations	• Maximum—Maximum number of base stations that can be concurrently supported by this BWG. • Current—Current number of signaling paths to all base stations. One signaling path is created between the BWG and each base station, so the current number of signaling paths is equal to the number of base stations currently connected to the BWG. • Created Count—Total number of signaling paths created on this BWG which include active and past signaling paths. • Created Rate—Rate at which signaling paths are created. • Deleted Count—Total number of signaling paths deleted on this BWG. • Deleted Rate—Rate at which signaling paths are deleted.
Data Paths	• Maximum—N/A • Current—Current number of data paths to all base stations. • Created Count—Total number of data paths created on this BWG which include active and past data paths. • Created Rate—Rate at which data paths are created. • Deleted Count—Total number of data paths deleted on this BWG. • Deleted Rate—Rate at which data paths are deleted.

Field	Description
Subscribers	• Maximum—Maximum number of subscribers that can be concurrently supported by this BWG. • Current—Number of subscribers currently connected to this BWG. • Created Count—Total number of subscribers created on this BWG which includes active and past subscribers • Created Rate—Rate at which subscribers are created. • Deleted Count—Total number of subscribers deleted on this BWG. • Deleted Rate—Rate at which subscribers are deleted.
Sessions	• Maximum—N/A • Current—Number of sessions currently active on this BWG. • Created Count—Total number of sessions created on this BWG which include active and past sessions. • Created Rate—Rate at which sessions are created. • Deleted Count—Total number of sessions deleted on this BWG. • Deleted Rate—Rate at which sessions are deleted.
Flows	• Maximum—N/A • Current—Current number of flows for all sessions active on this BWG. • Created Count—Total number of flows created on this BWG which include active and past flows. • Created Rate—Rate at which flows are created. • Deleted Count—Total number of flows deleted on this BWG. • Deleted Rate—Rate at which flows are deleted.
Hosts	• Maximum—N/A • Current—Current number of hosts connected to this BWG. • Created Count—Total number of hosts created on this BWG which include active and past hosts. • Created Rate—Rate at which hosts are created. • Deleted Count—Total number of hosts deleted on this BWG. • Deleted Rate—Rate at which hosts are deleted.

Miscellaneous Statistics

The Miscellaneous Statistics pane shows:

Field	Description
Framed Routes	Indicates the current number of unique framed routes downloaded from AAA and inserted into the IP routing table on a gateway.
Framed Router Subscribers	Indicates the number of subscribers using framed routes.

Field	Description
Auto-Provisioned Sessions	Indicates the number of auto-provisioned sessions on gateway.
Redirected Sessions	Indicates the number of sessions with all uplink IP packets redirected by the gateway.
Networks Behind Mobile Stations	Indicates the number of networks behind mobile stations.
Aged Out Hosts	• Count—Indicates the number of idle static hosts aged out. • Rate—Rate at which idle static hosts are aged out.

Signaling Packet Statistics

The Signaling Packet Statistics pane shows:

Field	Description
Pending	• Count—Total number of signaling packets currently pending on this BWG
Processed	• Count—Total number of signaling packets processed by this BWG. • Rate—Rate at which signaling packets are processed.
Requeued	• Count—Total number of signaling packets that were requeued on this BWG. • Rate—Rate at which signaling packets are requeued.
Congestion Drops	• Count—Number of signaling packets dropped when too many signaling packets are queued. The current queue limit is 1000 packets. • Rate—Rate at which signaling packets are dropped.
Service Disabled Drops	• Count—Number of signaling packets dropped due to disabled service. • Rate—Rate at which signaling packets are dropped.
Service Not Ready Drops	• Count—Number of signaling packets dropped while in non-active state for redundant configuration. • Rate—Rate at which signaling packets are dropped.
Encapsulation Errors Drops	• Count—Number of signaling packets dropped due to encapsulation errors. • Rate—Rate at which signaling packets are dropped.
Disposed Drops	• Count—Number of signaling packets disposed by the BWG. • Rate—Rate at which signaling packets are disposed.

DHCP Packet Statistics

The DHCP Packet Statistics pane shows:

Field	Description
Discover	• Count—Number of DHCP discover packets. • Rate—Rate at which DHCP packets are discovered.
Offer	• Count—Number of DHCP offer packets. • Rate—Rate at which DHCP packets are offered.
Request	• Count—Number of DHCP request packets. • Rate—Rate at which DHCP packets are requested.
Decline	• Count—Number of DHCP decline packets. • Rate—Rate at which DHCP packets are declined.
Ack	• Count—Number of DHCP acknowledged packets. • Rate—Rate at which DHCP packets are acknowledged.
Nak	• Count—Number of DHCP negatively acknowledged packets. • Rate—Rate at which DHCP packets are negatively acknowledged.
Release	• Count—Number of DHCP release packets. • Rate—Rate at which DHCP packets are released.
Inform	• Count—Number of DHCP inform packets. • Rate—Rate at which DHCP packets are informed.
Lease Query	• Count—Number of DHCP lease query packets. • Rate—Rate at which DHCP packets are lease queried.
Unknown	• Count—Number of DHCP unknown packets. • Rate—Rate at which DHCP packets are unknown.

Handoff Statistics

The Handoff Statistics pane shows:

Field	Description
Successful Handoffs	• Count—Number of successful session handoffs between Base Stations. • Rate—Rate at which successful session handoffs occur.
Failed Handoffs	• Count—Number of failed session handoffs between Base Stations. • Rate—Rate at which failed session handoffs occur.
Successful CMAC Key Updates	• Count—Number of successful CMAC Key count updates related to handoff between base stations. • Rate—Rate at which successful CMAC Key count updates are received.

Field	Description
Failed CMAC Key Updates	• Count—Number of failed CMAC Key count updates related to handoff between base stations. • Rate—Rate at which failed CMAC Key count updates are received.
Successful Security Key Updates	• Count—Number of successful security key updates during handoff between base stations. • Rate—Rate at which successful security key updates occur.
Failed Security Key Updates	• Count—Number of failed security key updates during handoff between base stations. • Rate—Rate at which failed security key updates occur.

Data Packet Statistics

The Data Packet Statistics pane shows:

Field	Description
Received IP Packets	• Count—Number of data packets received by the BWG. • Rate—Rate at which data packets are received by the BWG.
Received IP Bits	• Count—Number of data bits received by the BWG. • Rate—Rate at which data bits are received by the BWG.
Sent IP Packets	• Count—Number of data packets sent by the BWG. • Rate—Rate at which data packets are sent by the BWG.
Sent IP Bits	• Count—Number of data bits sent by the BWG. • Rate—Rate at which data bits are sent by the BWG.
Redirected IP Packets	• Count—Number of IP packets redirected by the BWG. • Rate—Rate at which IP packets are redirected by the BWG.
Redirected IP Bits	• Count—Number of IP bits redirected by the BWG. • Rate—Rate at which IP bits are redirected by the BWG.
Received Ethernet Packets	• Count—Number of ethernet packets received by the BWG. • Rate—Rate at which IP packets are redirected by the BWG.
Received Ethernet Bits	• Count—Number of ethernet bits received by the BWG. • Rate—Rate at which ethernet bits are received by the BWG.
Sent Ethernet Packets	• Count—Number of ethernet packets sent by the BWG. • Rate—Rate at which ethernet packets are sent by the BWG.
Sent Ethernet Bits	• Count—Number of ethernet bits sent by the BWG. • Rate—Rate at which ethernet bits are sent by the BWG.
Redirected Ethernet Packets	• Count—Number of ethernet packets redirected by the BWG. • Rate—Rate at which ethernet packets are redirected by the BWG.

Field	Description
Redirected Ethernet Bits	• Count—Number of ethernet bits redirected by the BWG. • Rate—Rate at which ethernet bits are redirected by the BWG.
Punted Data Packets	• Count—Number data packets punted from the cef path to the process path. • Rate—Rate at which packets are punted from the cef path to the process path.

Dropped Packet Statistics

The Dropped Packet Statistics pane shows:

Field	Description
Encapsulation Errors Drops	• Count—Number of data packets dropped due to encapsulation errors. • Rate—Rate at which data packets are dropped.
Invalid Address Drops	• Count—Number of data packets dropped due to invalid IP address. • Rate—Rate at which data packets are dropped.
Service Disabled Drops	• Count—Number of data packets dropped due to disabled service. • Rate—Rate at which data packets are dropped.
Invalid Protocol Type Drops	• Count—Number of data packets dropped due to invalid protocol types. • Rate—Rate at which data packets are dropped.
Length Error Drops	• Count—Number of data packets dropped due to IP packet length errors. • Rate—Rate at which data packets are dropped.
Absent Key Drops	• Count—Number of data packets dropped due to GRE key errors. • Rate—Rate at which data packets are dropped.
Flow Not Found Drops	• Count—Number of data packets dropped due to flow not found errors. • Rate—Rate at which data packets are dropped.
Flow Path Not Found Drops	• Count—Number of data packets dropped due to flow path not found errors. • Rate—Rate at which data packets are dropped due to flow path not found errors.
Flow Path Invalid Source Drops	• Count—Number of data packets dropped due to invalid source path address errors in the GRE header. • Rate—Rate at which data packets are dropped due to invalid source path address errors in the GRE header.
Session Not Found Drops	• Count—Number of data packets dropped due to session not found errors for the GRE key. • Rate—Rate at which data packets are dropped due to session not found errors.
Subscriber Not Found Drops	• Count—Number of data packets dropped due to subscriber not found errors for the GRE key. • Rate—Rate at which data packets are dropped due to subscriber not found errors.

Field	Description
Checksum Error Drops	• Count—Number of data packets dropped due to checksum errors. • Rate—Rate at which data packets are dropped due to checksum errors.
Ingress Filtering Drops	• Count—Number of data packets dropped due to subscriber invalid source IP address errors. • Rate—Rate at which data packets are dropped due to invalid source IP address errors.
Sequence Number Error Drops	• Count—Number of data packets dropped due to sequence number errors. • Rate—Rate at which data packets are dropped due to sequence number errors.
Fragmented Drops	• Count—Number of data packets dropped due to fragmented packet errors. • Rate—Rate at which data packets dropped due to fragmented packet errors.
Static IP Host Creation Failure Drops	• Count—Number of packets, such as upstream ARP and upstream data packets, dropped due to failure in creation of Static IP Host. • Rate—Rate at which data packets are dropped due to failure in creation of Static IP Host.
L2 Multicast and Broadcast Drops	• Number of L2 multicast and broadcast data packets other than ARP and DHCP dropped by BWG. • Rate—Rate at which L2 multicast and broadcast data packets are dropped.
Throttled Path Punt Drops	• Count—Number of data packets dropped due to throttling of punts. • Rate—Rate at which L2 multicast and broadcast data packets are dropped.
Learned Static Hosts Drops	• Count—Number of data packets dropped due to BWG learning about static hosts from upstream data packets. • Rate—Rate at which data packets are dropped due to BWG learning about static hosts from upstream data packets.

Profile Statistics

The Profile Statistics pane shows:

Field	Description
Service Flow Profile Not Found	• Count—Number of service flow creation errors due to an unconfigured service flow profile. • Rate—Rate at which creation errors are received.
QOS Profile Not Found	• Count—Number of service flow creation errors due to an unconfigured service flow QoS profile. • Rate—Rate at which creation errors are received.

Field	Description
Classifier Profile Not Found	• Count—Number of service flow creation errors due to an unconfigured service flow packet classifier profile. • Rate—Rate at which service flow creation errors occur due to an unconfigured service flow packet classifier profile.
SLA Profile Not Found	• Count—Number number of session creation failures due to configuration error in Service Level Agreement (SLA) profile on BWG. • Rate—Rate at which session creation failures occur due to configuration error in Service Level Agreement (SLA) profile on BWG.

Rejected Statistics

The Rejected Statistics pane shows:

Field	Description
Rejected Base Station Paths	• Count—Number of paths rejected because they exceeded the maximum number of base stations allowed to connect to this BWG. • Rate—Rate at which paths are rejected because they exceeded the maximum number of base stations allowed to connect to this BWG.
Unapproved Base Station Sessions	• Count—Number of session creation and/or session handoffs rejected because the requesting base station is not approved for it. • Rate—Rate at which created sessions and/or session handoffs are rejected because the base station is not approved for it.
Rejected Subscriber Sessions	• Count—Number of sessions rejected due to exceeding the maximum number of allowed subscribers. • Rate—Rate at which sessions that were rejected due to exceeding the maximum number of allowed subscribers.
Rejected Session Flows	• Count—Number of flows that were rejected due to exceeding the maximum number of flows allowed per session. • Rate—Rate at which flows were rejected due to exceeding the maximum number of flows allowed per session.
Session Deleted by the Gateway	• Count—Number of sessions deleted by the BWG. • Rate—Rate at which sessions were deleted by the BWG.
Rejected Hosts Open Requests	• Count—Number of *hosts open* requests rejected. • Rate—Rate at which *hosts open* requests are rejected.

Paths

Note For toolbar details, see Using the Toolbar, page 11-6.

The Paths subtab shows information and statistics about each base station and contains:

Column	Description
Remote IP Address	Path IP address at the base station side.
Local IP Address	Path IP address at the BWG side.
Type	Path type, can be signaling or data.
Sessions	Number of sessions over the path.
Flows	Number of flows over the path.
Sent IP Packets	• Count—Total number of IP packets sent over the path. • Rate—Rate at which IP packets are sent.
Sent IP Bits	• Count—Total number of IP bits sent over the path. • Rate—Rate at which IP bits are sent.
Received IP Packets	• Count—Total number of IP packets received over the path. • Rate—Rate at which IP packets are received.
Received IP Bits	• Count—Total number of IP bits received over the path. • Rate—Rate at which IP bits are received.
Sent Ethernet Packets	• Count—Total number of Ethernet packets sent over the path. • Rate—Rate at which Ethernet packets are sent.
Sent Ethernet Bits	• Count—Total number of Ethernet bits sent over the path. • Rate—Rate at which Ethernet bits are sent.
Received Ethernet Packets	• Count—Total number of Ethernet packets received over the path. • Rate—Rate at which Ethernet packets are received.
Received Ethernet Bits	• Count—Total number of Ethernet bits received over the path. • Rate—Rate at which Ethernet bits are received.

User Groups

The User Groups subtab shows information and statistics for user groups and contains:

- Sessions and Flow Statistics, page 11-71
- Traffic Statistics, page 11-71

Note For toolbar details, see Using the Toolbar, page 11-6.

Sessions and Flow Statistics

The Sessions and Flow Statistics pane shows:

Column	Description
Name	Domain name identifying a user group.
Service Mode	User group service mode.
Current Session Count	Total number of active sessions per user group.
Current Flows Count	Total number of active flows per user group.
Sessions Created	• Count—Total number of sessions created per user group. • Rate—Rate at which sessions are created.
Sessions Deleted	• Count—Total number of sessions deleted per user group. • Rate—Rate at which sessions are deleted.
Flows Created	• Count—Total number of flows created per user group. • Rate—Rate at which flows are created.
Flows Deleted	• Count—Total number of flows deleted per user group. • Rate—Rate at which flows are deleted.
Group Overwrites	• Count—Number of times this user group has been overwritten by the user group received from the AAA server. Users can belong to a particular user group at the time of initial entry and the AAA server can recategorize the user under a different user group after successful authentication. • Rate—Rate at which this user group has been overwritten by the user group received from the AAA server.

Traffic Statistics

The Traffic Statistics pane shows:

Column	Description
Name	Domain name identifying a user group.
Service Mode	User group service mode.
Sent IP Packets	• Count—Total number of IP packets sent over the path. • Rate—Rate at which IP packets are sent.
Sent IP Bits	• Count—Total number of IP bits sent over the path. • Rate—Rate at which IP bits are sent.
Received IP Packets	• Count—Total number of IP packets received over the path. • Rate—Rate at which IP packets are received.
Received IP Bits	• Count—Total number of IP bits received over the path. • Rate—Rate at which IP bits are received.

Column	Description
Sent Ethernet Packets	• Count—Total number of Ethernet packets sent over the path. • Rate—Rate at which Ethernet packets are sent.
Sent Ethernet Bits	• Count—Total number of Ethernet bits sent over the path. • Rate—Rate at which Ethernet bits are sent.
Received Ethernet Packets	• Count—Total number of Ethernet packets received over the path. • Rate—Rate at which Ethernet packets are received.
Received Ethernet Bits	• Count—Total number of Ethernet bits received over the path. • Rate—Rate at which Ethernet bits are received.
Invalid Source Packets	• Count—Number of packets dropped due to invalid source address errors. • Rate—Rate at which packets are dropped.
Invalid Source Bits	• Count—Number of bits dropped due to invalid source address errors. • Rate—Rate at which bits are dropped.

Displaying HA Real-Time Statistics

The MWTM enables you to display real-time statistics for Home Agent (HA) nodes in the MWTM web interface. To display HA real-time statistics, select a HA node in the navigation tree and click the Statistics tab. These subtabs appear:

- Global, page 11-72
- IP Local Pool Config, page 11-74
- IP Local Pool Stats, page 11-74

Global

The Global subtab shows global statistics for HA nodes and contains:

- Registrations Processed by AAA, page 11-73
- Registration Requests, page 11-73
- Standby Synchronization, page 11-74

Note For toolbar details, see Using the Toolbar, page 11-6.

Registrations Processed by AAA

The Registrations Processed by AAA pane shows:

Field	Description
Maximum Processed in one minute	The maximum number of registration requests processed in a minute by the HA. It includes only those registration requests which were authenticated by the AAA server.
Average time to process (msecs)	The average time taken by the home agent to process a registration request. Calculations are based on only those registration requests that were authenticated by the AAA server.
Authenticated via AAA Server	• Count—The total number of registration requests processed by the home agent, including only those registration requests that were authenticated by the AAA server. • Rate—The total rate of registration requests processed by the home agent, including only those registration requests that were authenticated by the AAA server.

Registration Requests

The Registration Requests pane shows:

Field	Description
Current Bindings	• Count—The current number of entries in the home agent's mobility binding list. The home agent updates this number in response to registration events from mobile nodes. • Rate—The count can increment or decrease, resulting in a positive or negative rate.
Initial Received	• Count—Total number of initial registration requests received by the HA. • Rate—Rate at which initial registration requests are received by the HA.
Initial Denied	• Count—Total number of initial registration requests denied by the HA. • Rate—Rate at which initial registration requests are denied by the HA.
All Received	• Count—Total number of all registration requests received by the HA. • Rate—Rate at which all registration requests are received by the HA.
All Denied	• Count—Total number of all registration requests denied by the HA. • Rate—Rate at which all registration requests are denied by the HA.

Standby Synchronization

The Standby Synchronization pane shows:

Field	Description
Binding Updates Sent	• Count—Total number of binding updates sent by the home agent to a standby home agent. • Rate—Total rate of binding updates sent by the home agent to a standby home agent.
Binding Updates Unacknowledged	• Count—Total number of binding updates sent by the home agent for which no acknowledgement is received from the standby home agent. • Rate—Total rate of binding updates sent by the home agent for which no acknowledgement is received from the standby home agent.

IP Local Pool Config

Note For toolbar details, see Using the Toolbar, page 11-6.

The IP Local Pool Config subtab shows IP addresses for HA nodes and contains:

Column	Description
Name	Name that uniquely identifies an IP local pool. This name must be unique among all the local IP pools even when they belong to different pool groups.
Addresses: Low	This object specifies the first IP address of the range of IP addresses contained by this pool entry. This address must be less than or equal to the High address.
Addresses: High	This object specifies the last IP address of the range of IP addresses mapped by this pool entry. If only a single address is being mapped, the value of this object is equal to the Low value.
Addresses: Free	Number of IP addresses available for use in the range of IP addresses.
Addresses: In Use	Number of IP addresses being used in the range of IP addresses.
Priority	This object specifies the priority of the IP local pool. IP local pools will be used in assigning IP addresses in the order of priority.

IP Local Pool Stats

Note For toolbar details, see Using the Toolbar, page 11-6.

The IP Local Pool Stats subtab shows IP addresses and IP addresses in use for HA nodes and contains:

Column	Description
Name	Name that uniquely identifies an IP local pool. This name must be unique among all the local IP pools even when they belong to different pool groups.
Addresses: Free	Number of IP addresses available for use in this IP local pool.
Addresses: In Use	Number of IP addresses being used in this IP local pool.
Addresses: Maximum In Use	Contains the high water mark of used addresses in an IP local pool since pool creation, since the system was restarted, or since this object was reset, whichever occurred last.
Addresses In Use: Low Threshold	When the number of used addresses in an IP local pool falls below this threshold value, a notification is generated.
Addresses In Use: High Threshold	When the number of used addresses in an IP local pool is equal or exceeds this threshold value, a notification is generated.
Addresses In Use: Low Threshold Percentage	When the percentage of used addresses in an IP local pool falls below this threshold value, a notification is generated.
Addresses In Use: High Threshold Percentage	When the percentage of used addresses in an IP local pool is equal or exceeds this threshold value, a notification is generated.

Displaying GGSN Real-Time Statistics

The MWTM enables you to display real-time statistics only in the MWTM web interface for Gateway GPRS Support Nodes (GGSNs) that reside on the Service and Application Module for IP (SAMI). To display GGSN real-time statistics, select a SAMI-based GGSN node in the navigation tree and click the Statistics tab. These subtabs appear:

- Global, page 11-75
- SGSN Throughput, page 11-81
- APN, page 11-82
- IP Local Pool Config, page 11-86
- IP Local Pool Stats, page 11-87

Global

Note For toolbar details, see Using the Toolbar, page 11-6.

The Global subtab shows global statistics for GGSN nodes and contains:

- GTP Statistics, page 11-76
- Charging Statistics, page 11-76
- GTP Throughput Statistics Ext, page 11-77

GTP Statistics

The GTP Statistics pane displays statistics about the GPRS Tunneling Protocol (GTP) and contains:

Field	Description
GTP Signaling Messages	GTP signaling messages sent between the Serving GPRS Support Node (SGSN) and GGSN.
G-PDU Messages	GTP Packet Data Unit (G-PDU) messages sent or received on an SGSN path.
G-PDU Octets	G-PDU bits sent or received in a GTP PDU message on an SGSN path.
Unexpected GTP Signaling Messages	Number of unexpected GTP signaling messages sent or received.
GTP Messages with Parser Errors	Number of GTP messages received with wrong value.
Sent	• Count—Number of messages or bits in the transmit direction. • Rate—The transmit rate of the messages or bits.
Received	• Count—Number of messages or bits in the receive direction. • Rate—The receive rate of the messages or bits.

Charging Statistics

The Charging Statistics pane displays count and rate statistics for GGSN charging messages and contains:

Field	Description
Current Open CDRs	• Count—The number of currently opened G-CDRs on the GGSN. • Rate—Rate of currently opened G-CDRs on the GGSN.
Current Closed CDRs	• Count—The number of currently closed G-CDRs on the GGSN which have not been sent to the CG. • Rate—Rate of currently closed G-CDRs on the GGSN which have not been sent to the CG.
Current Containers	• Count—The number of currently open or closed charging containers. • Rate—Rate of currently open or closed charging containers.
CDR Messages Pending	• Count—The number of currently pending G-CDR output messages. • Rate—Rate of currently pending G-CDR output messages.

Field	Description
CDR Messages Sent	• Count—The number of transmitted G-CDR output messages since the charging service is enabled. • Rate—Rate of transmitted G-CDR output messages since the charging service is enabled.
CDRs Opened	• Count—Total number of CDRs opened on the GGSN either since system startup or since the last time the charging statistics was cleared. • Rate—Rate of CDRs opened on the GGSN either since system startup or since the last time the charging statistics was cleared.
Containers Created	• Count—Total number of containers created on the GGSN either since system startup or since the last time the charging statistics was cleared. • Rate—Rate of containers created on the GGSN either since system startup or since the last time the charging statistics was cleared.
Service Records Created	• Count—Total number of service records created on the GGSN either since the system startup or since the time the service aware feature is enabled. • Rate—Rate of service records created on the GGSN either since the system startup or since the time the service aware feature is enabled.
Total Unique APNs	• Count—The number of access points for which charging data is being collected. • Rate—Rate of access points for which charging data is being collected.
Charging Gateway Down Times	• Count—The number of occurrences of cgprsCgAlarmEchoFailure traps state transitions since system startup. • Rate—Rate of occurrences of cgprsCgAlarmEchoFailure traps state transitions since system startup.

GTP Throughput Statistics Ext

The GTP Throughput Statistics Ext pane displays count and rate statistics about GTP throughput and contains:

Field	Description
GTP Packets	GTP packets between the GGSN and SGSN.
GTP Bytes	GTP bytes between the GGSN and SGSN.
Sampling Interval in Minutes: 3	Global GTP throughput statistics on the GGSN for a duration of 3 minutes.
Sampling Interval in Minutes: 5	Global GTP throughput statistics on the GGSN for a duration of 5 minutes.
Data age (minutes)	The difference in minutes between the time when the data was collected and retrieved. This is the time that has elapsed after the previous collection or update of the data.
Upstream	Rate (per second) of upstream GTP traffic during the last sampling period.
Downstream	Rate (per second) of downstream GTP traffic during the last sampling period.

PDP Context Statistics

The PDP Context Statistics pane shows count and rate values for these statistics:

Field	Description
Active GTP v0 PDP Contexts	• Count—PDP contexts (GTP version 0) that are active. • Rate—The rate of active PDP contexts (GTP version 0).
Active GTP v1 PDP Contexts	• Count—PDP contexts (GTP version 1) that are active. • Rate—The rate of active PDP contexts (GTP version 1).
PDP Contexts Created	• Count—PDP contexts that were created. • Rate—Rate of PDP contexts that were created.
PDP Contexts Deleted	• Count—PDP contexts that were deleted. • Rate—Rate of PDP contexts that were deleted.
PDP Context Activations Rejected	• Count—PDP contexts for which the activation request was rejected. • Rate—Rate of PDP contexts for which the activation request was rejected.
PDP PPP-Regen Interfaces Created	• Count—Device-specific interfaces created for association with PDP contexts regenerated to a PPP session. • Rate—Rate of device-specific interfaces created for association with PDP contexts regenerated to a PPP session.
Active PDP Contexts with Direct Tunnel	• Count—Active PDP contexts with direct tunnel enabled. • Rate—Rate of active PDP contexts with direct tunnel enabled.
PDP Contexts Deleted Without Waiting for the SGSN	• Count—PDPs deleted in the GGSN without waiting for a delete context response from the SGSN. • Rate—Rate of PDPs deleted in the GGSN without waiting for a delete context response from the SGSN.
PDP Contexts Deleted Without Sending to the SGSN	• Count—PDPs deleted in the GGSN without sending a delete request to the SGSN. • Rate—Rate of PDPs deleted in the GGSN without sending a delete request to the SGSN.
Update PDP Context Requests Sent	• Count—Update PDP context requests that the GGSN initiated and that were sent to the SGSN. • Rate—Rate of update PDP context requests that the GGSN initiated and that were sent to the SGSN.
Update PDP Context Responses Received	• Count—Update PDP context responses received from the SGSN for the GGSN-initiated update requests. • Rate—Rate of update PDP context responses received from the SGSN for the GGSN-initiated update requests.
COA Messages Received	• Count—Change of Authorization (COA) messages received at the GGSN. • Rate—Rate of COA messages received at the GGSN.
COA Messages Dropped	• Count—COA messages dropped at the GGSN. • Rate—Rate of COA messages dropped at the GGSN.

Field	Description
COA QOS Updates Sent	• Count—Update PDP requests for QOS changes that COA initiated and that are sent from the GGSN. • Rate—Rate of update PDP requests for QOS changes that COA initiated and that are sent from the GGSN.
Error Indication Messages Received	• Count—Number of error indication messages received on the GGSN. • Rate—Rate of error indication messages received on the GGSN.
Direct Tunnels Enabled	• Count—Direct tunnels enabled for the PDP contexts in the GGSN. • Rate—Rate of direct tunnels enabled for the PDP contexts in the GGSN.
Error Indications for DT PDP Contexts	• Count—Error indications received for Direct Tunnel (DT) PDP contexts from the Radio Network Controller (RNC). • Rate—Rate of error indications received for Direct Tunnel (DT) PDP contexts from the Radio Network Controller (RNC).
DT PDP Contexts Deleted Due to Update Response	• Count—Direct tunnel PDP contexts deleted because of update response failure. • Rate—Rate of direct tunnel PDP contexts deleted because of update response failure.
PDP Context Activations Failure Ratio	• Count—Number of PDP context activation failures. • Rate—Rate of PDP context activation failures.
PDP Context Requests Rejected due to Insufficient Resources	• Count—Number of PDP context requests rejected due to insufficient resources. • Rate—Rate of PDP context requests rejected due to insufficient resources.
PDP Context Requests Rejected due to Insufficient Resources for PPP Regeneration	• Count—Number of PDP context Requests rejected due to insufficient resources for PPP regeneration. • Rate—Rate of PDP context requests rejected due to insufficient resources for PPP regeneration.
PDP Context Requests Dropped due to the PPP Regeneration Threshold Limit	• Count—Number of PDP context requests dropped due to the PPP regeneration threshold limit. • Rate—Rate of PDP context requests dropped due to the PPP regeneration threshold limit.
PDP Context Messages with TFT Semantic Errors	• Count—Number of PDP context messages with TFT semantic errors. • Rate—Rate of PDP context messages with TFT semantic errors.
PDP Context Messages with TFT Syntax Errors	• Count—Number of PDP context messages with TFT syntax errors. • Rate—Rate of PDP context messages with TFT syntax errors.
PDP Context Messages with Packet Filter Syntax Errors	• Count—Number of PDP context messages with packet filter syntax errors. • Rate—Rate of PDP context messages with packet filter syntax errors.
PDP Context Messages with Packet Filter Semantic Errors	• Count—Number of PDP context messages with packet filter semantic errors. • Rate—Rate of PDP context messages with packet filter semantic errors.
Error indication Messages Sent	• Count—Number of error indication messages sent. • Rate—Rate at which the error indication messages are sent.

AAA Authentication Statistics

AAA Authentication Statistics pane shows:

Field	Description
Server Name	Name of the server.
Server State	Whether the server is up (operational) or down (not operational).
Transactions Completed	• Count—Number of authentication transactions with the server which succeeded since it is made active. • Rate—Rate at which the authentication transactions with the server are succeeded since it is made active.
Transaction Failures	• Count—Number of authentication transactions with this server which failed since it is made active. • Rate—Rate at which the authentication transactions with the server are failed since it is made active.
Requests	• Count—Number of authentication requests sent to this server since it is made active. • Rate—Rate at which the authentication requests are sent to the server since it is made active.
Request Timeouts	• Count—Number of authentication requests which are timed out since it is made active. • Rate—Rate at which the authentication requests are timed out since it is made active.
Error Responses	• Count—Number of server ERROR authentication responses received from this server since it is made active. • Rate—Rate at which the server ERROR authentication responses are received from the server since it is made active.
Incorrect Responses	• Count—Number of authentication responses which could not be processed since it is made active. • Rate—Rate (per second) of authentication responses which could not be processed since it is made active.

AAA Accounting Statistics

AAA Accounting Statistics pane shows:

Field	Description
Server Name	Name of the server.
Server State	Whether the server is up (operational) or down (not operational).
Transactions Completed	• Count—Number of accounting transactions with the server which succeeded since system reinitialization. • Rate—Rate at which the accounting transactions with the server are succeeded since it is made active.
Transaction Failures	• Count—Number of accounting transactions with this server which failed since system reinitialization. • Rate—Rate at which the accounting transactions with the server are failed since it is made active.
Requests	• Count—Number of accounting requests sent to this server since system reinitialization. • Rate—Rate at which the accounting requests are sent to the server since it is made active.

Field	Description
Request Timeouts	• Count—Number of accounting requests which have timed out since system reinitialization. • Rate—Rate at which the accounting requests are timed out since it is made active.
Error Responses	• Count—Number of server ERROR accounting responses received from this server since system reinitialization. • Rate—Rate at which the server ERROR accounting responses are received from the server since it is made active.
Incorrect Responses	• Count—Number of accounting responses which could not be processed since system reinitialization. • Rate—Rate of accounting responses which could not be processed since system reinitialization.

IP and UDP Statistics

The IP and UDP Statistics pane shows:

Field	Description
IP In Header Errors	Input datagrams discarded because of errors in their IP headers, including bad checksums, version number mismatches, other format errors, time-to-live exceeded, and errors discovered in processing their IP options.
IP Out Discards	Outbound packets that were discarded although no errors were detected. One reason for discarding a packet would be to free buffer space.
IP Out No Routes	IP datagrams discarded because no route could be found to transmit them. This statistic includes any datagrams that a host cannot route because all its default gateways are down.
IP Reassembly Fails	Failures detected by the IP reassembly algorithm.
IP Routing Discards	Routing entries that were discarded even though they are valid. One reason for discarding a routing entry would be to free buffer space for other routing entries.
UDP In Datagrams	UDP datagrams delivered to UDP users.

SGSN Throughput

Note For toolbar details, see Using the Toolbar, page 11-6.

The SGSN Throughput subtab shows:

Field	Description
SGSN Name	Name of the SGSN.
Sampling Interval in Minutes: 3	Throughput statistics on the SGSN for a duration of 3 minutes.
Sampling Interval in Minutes: 5	Throughput statistics on the SGSN for a duration of 5 minutes.

Field	Description
Upstream Packets	Rate (per second) of upstream packets sent on this SGSN during the last sampling period.
Upstream Bytes	Rate (per second) of upstream bytes sent on this SGSN during the last sampling period.
Downstream Packets	Rate (per second) of downstream packets sent on this SGSN during the last sampling period.
Downstream Bytes	Rate (per second) of downstream bytes sent on this SGSN during the last sampling period.
Data age (minutes)	The difference in minutes between the time when the data was collected and retrieved. This is the time that has elapsed after the previous collection or update of the data.

APN

Note For toolbar details, see Using the Toolbar, page 11-6.

The APN subtab contains:

APN Instance Throughput

To view the APN Instance Throughput Statistics table, choose this option from the Type drop-down menu. The GUI displays the count and rate values for these statistics:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Upstream Bits	• Count—Number of upstream bits sent on this APN during the last sampling period. • Rate—Rate (per second) of upstream bits sent on this APN during the last sampling period.
Downstream Bits	• Count—Number of downstream bits sent on this APN during the last sampling period. • Rate—Rate (per second) of downstream bits sent on this APN during the last sampling period.

Field	Description
Upstream Packets	• Count—Number of upstream packets sent on this APN during the last sampling period. • Rate—Rate (per second) of upstream packets sent on this APN during the last sampling period.
Downstream Packets	• Count—Number of downstream packets sent on this APN during the last sampling period. • Rate—Rate (per second) of downstream packets sent on this APN during the last sampling period.

APN Instance Throughput Ext

To view the APN Instance Throughput Ext Statistics table, choose this option from the Type drop-down menu. The GUI displays the count and rate values for these statistics:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Sampling Interval in Minutes: 3	Throughput statistics on the APN for a duration of 3 minutes.
Sampling Interval in Minutes: 5	Throughput statistics on the APN for a duration of 5minutes.
Upstream Packets	Rate (per second) of upstream packets sent on this APN during the last sampling period.
Upstream Bits	Rate (per second) of upstream bytes sent on this APN during the last sampling period.
Downstream Packets	Rate (per second) of downstream packets sent on this APN during the last sampling period.
Downstream Bytes	Rate (per second) of downstream bytes sent on this APN during the last sampling period.
Data Age (minutes)	The difference in minutes between the time when the data was collected and retrieved. This is the time that has elapsed after the previous collection or update of the data.

APN Instance PDP

To view the APN Instance PDP Statistics table, choose this option from the Type drop-down menu. The GUI displays the count and rate values for these statistics:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Active PDP/Bearers	• Count—Current number of active PDP/Bearer contexts on this APN.
PDP/Bearer Activations by MS Success	• Count—Total number of successfully completed PDP/Bearer context activation procedures by the MS on this APN. • Rate—Rate (per second) of successfully completed PDP/Bearer context activation procedures by the MS on this APN. • Ratio—Number of successful activations for every 100 activation attempts.

Field	Description
PDP/Bearer Activations by MS Failure	• Count—Total number of failed PDP/Bearer context activation procedures by the MS on this APN. • Rate—Rate (per second) of failed PDP/Bearer context activation procedures by the MS on this APN.
PDP/Bearer Deactivations by Network Success	• Count—Total number of successfully completed PDP/Bearer context deactivation procedures by the GGSN on this APN. • Rate—Rate (per second) of successfully completed PDP/Bearer context deactivation procedures by the GGSN on this APN.
PDP/Bearer Deactivations by Network Failure	• Count—Total number of failed PDP/Bearer context deactivation procedures by the GGSN on this APN. • Rate—Rate (per second) of failed PDP/Bearer context deactivation procedures by the GGSN on this APN.
PDP/Bearer Deactivations by Network PDP/Bearer Retainability	• Ratio—For every 100 PDP/Bearer contexts, the number of activations whose deactivation was not completed by the GGSN.
PDP/Bearer Deactivations By MS Success	• Count—Total number of successfully completed PDP/Bearer context deactivation procedures by the MS on this APN. • Rate—Rate (per second) of successfully completed PDP/Bearer context deactivation procedures by the MS on this APN. • Ratio—Number of successful deactivations for every 100 deactivation attempts.
PDP/Bearer Deactivations By MS Failure	• Count—Total number of failed PDP/Bearer context deactivation procedures by the MS on this APN. • Rate—Rate (per second) of failed PDP/Bearer context deactivation procedures by the MS on this APN.

APN Instance PDP Ext

To view the APN Instance PDP Ext Statistics table, choose this option from the Type drop-down menu. The GUI displays the count and rate values for these statistics:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Dynamic PDP/Bearer Activations By MS Success	• Count—Total number of successfully completed dynamic PDP/Bearer context activation procedures initiated by MS on this APN. • Rate—Rate (per second) of successfully completed dynamic PDP/Bearer context activation procedures initiated by MS on this APN. • Ratio—Number of successful dynamic activations for every 100 dynamic activation attempts.
Dynamic PDP/Bearer Activations By MS Failure	• Count—Total number of failed dynamic PDP/Bearer context activation procedures initiated by MS on this APN. • Rate—Rate (per second) of failed dynamic PDP/Bearer context activation procedures initiated by MS on this APN.

Field	Description
PDP/Bearer Activations By Network Success	• Count—Total number of successfully completed network initiated PDP/Bearer context activation procedures. • Rate—Rate (per second) of successfully completed network initiated PDP/Bearer context activation procedures. • Ratio—Number of successful network initiated activations for every 100 activation attempts.
PDP/Bearer Activations By Network Failure	• Count—Total number of failed network initiated PDP/Bearer context activation procedures. • Rate—Rate (per second) of failed network initiated PDP/Bearer context activation procedures.
PDP/Bearer Updates By Network Success	• Count—Total number of successful update responses received from the SGSN for GGSN initiated update requests on this APN. • Rate—Rate (per second) of successful update responses received from the SGSN for GGSN initiated update requests on this APN. • Ratio—Number of successful update responses received for every 100 update attempts.
PDP/Bearer Updates By Network Failure	• Count—Total number of failed update responses received from the SGSN for GGSN initiated update requests on this APN. • Rate—Rate (per second) of failed update responses received from the SGSN for GGSN initiated update requests on this APN.

APN Instance Miscellaneous

To view the APN Instance Miscellaneous Statistics table, choose this option from the Type drop-down menu. The GUI displays count and rate values for these statistics:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
DHCP Requests Success	• Count—Total number of successful DHCP address request sent by the GGSN or PDNGW on this APN. • Rate—Rate at which the successful DHCP address requests are sent by the GGSN or PDNGW on this APN. • Ratio—Number of successful DHCP requests for every 100 DHCP requests.
DHCP Requests Failure	• Count—Total number of unsuccessful DHCP address request sent by the GGSN or PDNGW on this APN. • Rate—Rate at which the unsuccessful DHCP address requests are sent by the GGSN or PDNGW on this APN.
DHCP Releases	• Count—Total number of DHCP address release request sent by the GGSN or PDNGW on this APN. • Rate—Rate at which the DHCP address release request is sent by the GGSN or PDNGW on this APN.

Field	Description
COA Message Success	• Count—Number of successfully acknowledged COA messages by the GGSN or PDNGW with a COA ACK. • Rate—Rate of successfully acknowledged COA messages by the GGSN or PDNGW with a COA ACK. • Ratio—Number of successfully acknowledged COA messages for every 100 COA messages received on this APN.
COA Message Failure	• Count—Number of unsuccessfully acknowledged COA messages by the GGSN or PDNGW with a COA ACK. • Rate—Rate of unsuccessfully acknowledged COA messages by the GGSN or PDNGW with a COA ACK.
Direct Tunnels Enabled	• Count—Direct tunnels enabled for the PDP contexts on this APN. • Rate—Rate at which the direct tunnels are enabled for the PDP contexts on this APN.

IP Local Pool Config

Note For toolbar details, see Using the Toolbar, page 11-6.

The IP Local Pool Config subtab shows IP addresses for GGSN, PDNGW, SGW, or SPGW nodes and contains:

Field	Description
Name	Name of the IP local pool.
Addresses	• Low—The first IP address of the range of IP addresses contained by this pool entry. • High—The last IP address of the range of IP addresses mapped by this pool entry. • Free—Number of IP addresses available for use within the range of IP addresses. • In Use—Number of IP addresses being used within the range of IP addresses.

IP Local Pool Stats

Note For toolbar details, see Using the Toolbar, page 11-6.

The IP Local Pool Stats subtab shows IP addresses and IP addresses in use for GGSN, PDNGW, SGW, or SPGW nodes and contains:

Field	Description
Name	Name of the IP local pool.
Addresses	• Free—Number of IP addresses available for use in this IP local pool. • In Use—Number of IP addresses being used in this IP local pool. • Maximum in Use—The maximum number of used addresses in an IP local pool since pool creation, since the system was restarted, or since this object was reset, whichever occurred last.

Displaying PDSN Real-Time Statistics

The MWTM enables you to display real-time statistics for Packet Data Serving Node (PDSN) nodes in the MWTM web interface. To display PDSN real-time statistics, select a PDSN node in the navigation tree and click the Statistics tab. The following option appears under Type drop-down menu:

- System Statistics, page 11-87

System Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the System Statistics, choose this option from Type drop-down menu. The GUI displays the following categories:

- Session Statistics, page 11-88
- Flow Statistics, page 11-89
- Session Bandwidth Statistics, page 11-90
- PCF Statistics, page 11-90
- Traffic Statistics, page 11-91

Session Statistics

The Session Statistics pane contains:

Field	Description
Maximum Allowed Sessions	Count—Maximum number of sessions allowed by the system.
Session Failure Ratio	Count—Ratio of session failures.
Session Utilization	Count—Total session utilization.
Total Active Sessions	Count—Total number of sessions in active state.
Total Dormant Sessions	Count—Total number of sessions in dormant state.
Total HDLC over GRE Sessions	Count—Total number of HDLCoGRE sessions currently established with the system.
Total PPP over GRE Sessions	Count—Total number of PPPoGRE sessions currently established with the system.
Total Session Failures	Count—Number of A10/A11 session failures occurring since PDSN agent restarted.
Total Sessions	Count—Total number of sessions currently established with the system.
Total Sessions Established	Count—Total number of sessions established since system was last restarted.
Total Sessions Established Rate	Count—Rate at which the sessions were established since system was last restarted.
Total Sessions Release	Count—Total number of sessions released since system was last restarted.
Total Sessions Released Rate	Count—Rate at which the sessions were released since system was last restarted.

Flow Statistics

The Flow Statistics pane contains:

Field	Description
Flow Failure Ratio	• Count—Ratio of flow failures.
Total Mobile IP Flow Failures	• Count—Total number of mobile IP flow setup request failed since system reboot. • Rate—Rate of mobile IP flow setup request failed since system reboot.
Total Mobile IP Flows	• Count—Total number of flows currently using MoIP services.
Total Mobile IP Flows Established	• Count—Total number of mobile IP flow that has been established successfully since system reboot. • Rate—Rate of mobile IP flow that has been established successfully since system reboot.
Total MSID Flows	• Count—Total number of flows currently using MSID service.
Total Proxy Mobile IP Flow Failures	• Count—Total number of proxy mobile IP flow setup request failed since system reboot. • Rate—Rate of proxy mobile IP flow setup request failed since system reboot.
Total Proxy Mobile IP Flows	• Count—Total number of flows currently using proxy MoIP service.
Total Proxy Mobile IP Flows Established	• Count—Total number of proxy mobile IP flow that has been established successfully since system reboot. • Rate—Rate of proxy mobile IP flow that has been established successfully since system reboot.
Total Simple IP Flow Failures	• Count—Total number of simple IP flow setup request failed since last system reboot. • Rate—Rate of simple IP flow setup request failed since last system reboot.
Total Simple IP Flows	• Count—Total number of flows currently using simple IP service.
Total Simple IP Flows Established	• Count—Total number of Simple IP flow that has been established successfully since system reboot. • Rate—Rate of Simple IP flow that has been established successfully since system reboot.
Total Unknown Type Flow Failures	• Count—Total number of unknown type flow setup request failed since last system reboot. • Rate—Rate of unknown type flow setup request failed since last system reboot.
Total VPDN Flow Failures	• Count—Total number of VPDN flow setup request failed since last system reboot. • Rate—Rate of VPDN flow setup request failed since last system reboot.

Field	Description
Total VPDN Flows	• Count—The total number of flows currently using VPDN service.
Total VPDN Flows Established	• Count—Total number of VPDN flow that has been established successfully since system reboot. • Rate—Rate of VPDN flow that has been established successfully since system reboot.

Session Bandwidth Statistics

The Session Bandwidth Statistics pane contains:

Field	Description
Bandwidth Utilization	Count—Total bandwidth that has been utilized.
Total Allocated Bandwidth	Count—Total bandwidth allocated for sessions currently established on the PDSN.
Total Available Bandwidth	Count—Bandwidth available on the PDSN system for creation of new sessions.
Total Configured Bandwidth	Count—total bandwidth value configured via the CLI that would be supported by PDSN system.

PCF Statistics

The PCF Statistics pane contains:

Field	Description
Maximum Allowed PCFs	Count—Maximum number of PCF allowed by the system.
PCF Utilization	Count—Total PCF utilization.
Total PCFs	Count—Total number of PCF currently interacting with the system.

Traffic Statistics

The Traffic Statistics pane contains:

Field	Description
Proxy Mobile IP Packets Received	• Count—Total number of proxy mobile IP data packets received from mobile stations by PDSN since system was last restarted. • Rate—Rate at which the proxy mobile IP data packets are received from mobile stations by PDSN since system was last restarted.
Short Data Burst Packets Sent	• Count—Total number of SDB marked data packets sent to PCF from PDSN since system was last restarted. • Rate—Rate at which the SDB marked data packets are sent to PCF from PDSN since system was last restarted.
Simple IP Packets Sent	• Count—Total number of simple IP data packets sent to mobile stations since system was last restarted. • Rate—Rate at which the simple IP data packets are sent to mobile stations since system was last restarted.
Mobile IP Packets Sent	• Count—Total number of mobile IP data packets sent to mobile stations from PDSN since system was last restarted. • Rate—Rate at which the mobile IP data packets are sent to mobile stations from PDSN since system was last restarted.
No Session Packet Discards	• Count—Total number of packets discarded from PCF because of missing session since system was last restarted. • Rate—Rate at which the packets are discarded from PCF because of missing session since system was last restarted.
Proxy Mobile IP Packets Sent	• Count—Total number of proxy mobile IP data packets sent to mobile stations from PDSN since system was last restarted. • Rate—Rate at which the proxy mobile IP data packets are sent to mobile stations from PDSN since system was last restarted.
Invalid GRE Protocol Packet Discards	• Count—Total number of packets discarded from PCF because of invalid GRE protocol since system was last restarted. • Rate—Rate at which the packets are discarded from PCF because of invalid GRE protocol since system was last restarted.
Mobile IP Packets Received	• Count—Total number of mobile IP data packets received from mobile stations since system was last restarted. • Rate—Rate at which the mobile IP data packets are received from mobile stations since system was last restarted.
Simple IP Bits Sent	• Count—Total number of simple IP data octets (in unit of 1024 octets) sent to mobile stations from PDSN since system was last restarted. • Rate—Rate at which the simple IP data octets (in unit of 1024 octets) are sent to mobile stations from PDSN since system was last restarted.

Field	Description
Mobile IP Bits Received	• Count—Total number of mobile IP data octets (in unit of 1024 octets) received from mobile stations by PDSN since system was last restarted. • Rate—Rate at which the mobile IP data octets (in unit of 1024 octets) are received from mobile stations by PDSN since system was last restarted.
Short Data Burst Bits Sent	• Count—Total number of SDB marked data octets sent to PCF from PDSN since system was last restarted. • Rate—Rate at which the SDB marked data octets are sent to PCF from PDSN since system was last restarted.
Proxy Mobile IP Bits Sent	• Count—Total number of proxy mobile IP data octets (in unit of 1024 octets) sent to mobile stations from PDSN since system was last restarted. • Rate—Rate at which the proxy mobile IP data octets (in unit of 1024 octets) are sent to mobile stations from PDSN since system was last restarted.
Mobile IP Bits Sent	• Count—Total number of mobile IP data octets (in unit of 1024 octets) sent to mobile stations from PDSN since system was last restarted. • Rate—Rate at which the mobile IP data octets (in unit of 1024 octets) are sent to mobile stations from PDSN since system was last restarted.
Proxy Mobile IP Bits Received	• Count—Total number of proxy mobile IP data octets (in unit of 1024 octets) received from mobile stations since system was last restarted. • Rate—Rate at which the proxy mobile IP data octets (in unit of 1024 octets) are received from mobile stations since system was last restarted.
Simple IP Bits Received	• Count—Total number of simple IP data octets (in unit of 1024 octets) received from mobile stations by PDSN since system was last restarted. • Rate—Rate at which the simple IP data octets (in unit of 1024 octets) are received from mobile stations by PDSN since system was last restarted.
No GRE Key Packet Discards	• Count—Total number of packets discarded from PCF because of the missing GRE Keying since system was last restarted. • Rate—Rate at which the packets are discarded from PCF because of the missing GRE Key since system was last restarted.
Invalid Checksum Packet Discards	• Count—Total number of packets discarded from PCF because of invalid checksum since system was last restarted. • Rate—Rate at which the packets are discarded from PCF because of invalid checksum since system was last restarted.
Simple IP Packets Received	• Count—Total number of simple IP data packets received from mobile stations since system was last restarted. • Rate—Rate at which the simple IP data packets are received from mobile stations since system was last restarted.

Displaying SGW Real-Time Statistics

The MWTM enables you to display real-time statistics for SGW nodes in the MWTM web interface. To display real-time statistics, select the node in the navigation tree and click the Statistics tab. These options appear under the Type drop down list:

AAA

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the AAA statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

AAA Authentication Statistics

AAA Authentication Statistics pane shows:

Column	Description
Server Name	Name of the server.
Server State	Whether the server is up (operational) or down (not operational).
Transactions Completed	• Count—Number of authentication transactions with the server which succeeded since it is made active. • Rate—Rate at which the authentication transactions with the server are succeeded since it is made active.

Column	Description
Transaction Failures	• Count—Number of authentication transactions with this server which failed since it is made active. • Rate—Rate at which the authentication transactions with the server are failed since it is made active.
Requests	• Count—Number of authentication requests sent to this server since it is made active. • Rate—Rate at which the authentication requests are sent to the server since it is made active.
Request Timeouts	• Count—Number of authentication requests which are timed out since it is made active. • Rate—Rate at which the authentication requests are timed out since it is made active.
Error Responses	• Count—Number of server ERROR authentication responses received from this server since it is made active. • Rate—Rate at which the server ERROR authentication responses are received from the server since it is made active.
Incorrect Responses	• Count—Number of authentication responses which could not be processed since it is made active. • Rate—Rate of authentication responses which could not be processed since it is made active.

AAA Accounting Statistics

AAA Accounting Statistics pane shows:

Column	Description
Server Name	Name of the server.
Server State	Whether the server is up (operational) or down (not operational).
Transactions Completed	• Count—Number of accounting transactions with the server which succeeded since system reinitialization. • Rate—Rate at which the accounting transactions with the server are succeeded since it is made active.
Transaction Failures	• Count—Number of accounting transactions with this server which failed since system reinitialization. • Rate—Rate at which the accounting transactions with the server are failed since it is made active.
Requests	• Count—Number of accounting requests sent to this server since system reinitialization. • Rate—Rate at which the accounting requests are sent to the server since it is made active.
Request Timeouts	• Count—Number of accounting requests which have timed out since system reinitialization. • Rate—Rate at which the accounting requests are timed out since it is made active.
Error Responses	• Count—Number of server ERROR accounting responses received from this server since system reinitialization. • Rate—Rate at which the server ERROR accounting responses are received from the server since it is made active.
Incorrect Responses	• Count—Number of accounting responses which could not be processed since system reinitialization. • Rate—Rate of accounting responses which could not be processed since system reinitialization.

APN Instance Throughput

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance Throughput Statistics table, choose this option from the Type drop-down menu. The GUI displays the count and rate values for these statistics:

Column	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Upstream Bits	• Count—Number of upstream bits sent on this APN during the last sampling period. • Rate—Rate (per second) of upstream bits sent on this APN during the last sampling period.
Downstream Bits	• Count—Number of downstream bits sent on this APN during the last sampling period. • Rate—Rate (per second) of downstream bits sent on this APN during the last sampling period.
Upstream Packets	• Count—Number of upstream packets sent on this APN during the last sampling period. • Rate—Rate (per second) of upstream packets sent on this APN during the last sampling period.
Downstream Packets	• Count—Number of downstream packets sent on this APN during the last sampling period. • Rate—Rate (per second) of downstream packets sent on this APN during the last sampling period.

APN Instance Throughput Ext

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance Throughput Ext Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Sampling Interval in Minutes: 3	Throughput statistics on the APN for a duration of 3 minutes.
Sampling Interval in Minutes: 5	Throughput statistics on the APN for a duration of 5minutes.
Upstream Packets	Rate (per second) of upstream packets sent on this APN during the last sampling period.
Upstream Bits	Rate (per second) of upstream bits sent on this APN during the last sampling period.
Downstream Packets	Rate (per second) of downstream packets sent on this APN during the last sampling period.

Field	Description
Downstream Bits	Rate (per second) of downstream bits sent on this APN during the last sampling period.
Data Age (minutes)	The difference in minutes between the time when the data was collected and retrieved. This is the time that has elapsed after the previous collection or update of the data.

APN Instance Bearer

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance Bearer statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Active Bearers	• Count—Total number of bearers on this APN.
Bearer Activations Success	• Count—Total number of successfully completed Bearer activation procedures by MS on this APN. • Rate—Rate (per second) of successfully completed Bearer activation procedures by the MS on this APN. • Ratio—Number of successful activations for every 100 activation attempts.
Bearer Activations Failure	• Count—Total number of failed Bearer activation procedures by the MS on this APN. • Rate—Rate (per second) of failed Bearer activation procedures by the MS on this APN.
Bearer Deactivations Success	• Count—Total number of successfully completed Bearer deactivation procedures by the SGW on this APN. • Rate—Rate (per second) of successfully completed Bearer deactivation procedures by the SGW on this APN.
Bearer Updates Success	• Count—Total number of successful bearer update initiated by network. • Rate—Rate (per second) of successful bearer update initiated by network. • Ratio—Number of successful bearer update initiated by network for every 100 attempts.
Bearer Updates Failure	• Count—Total number of unsuccessful bearer modify initiated by MME or SGSN. • Rate—Rate at which the unsuccessful bearer modify initiated by MME or SGSN.
Bearer Modifications Success	• Count—Total number of successful bearer modify initiated by MME or SGSN. • Rate—Rate (per second) of successful bearer modify initiated by MME or SGSN. • Ratio—Number of successful bearer modify initiated by MME or SGSN for every 100 initiation attempts.
Bearer Modifications Failure	• Count—Total number of unsuccessful bearer modify initiated by MME or SGSN. • Rate—Rate at which the unsuccessful bearer modify initiated by MME or SGSN.

Field	Description
Dedicated Bearer Activations Success	• Count—Total number of successful dedicated bearer creation initiated by network. • Rate—Rate (per second) of successful dedicated bearer creation initiated by network. • Ratio—Number of successful dedicated bearer creation for every 100 bearer creation attempts.
Dedicated Bearer Activations Failure	• Count—Total number of unsuccessful dedicated bearer activation procedures received on this APN. • Rate—Rate (per second) of unsuccessful dedicated bearer activation procedures received on this APN.

EPC Buffering

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the EPC Buffering Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

- Buffering Configuration, page 11-97
- Buffering Status, page 11-97
- Buffering Statistics, page 11-98

Buffering Configuration

The Buffering Configuration pane shows:

Field	Description
Buffering Agent Status	The state of buffering agent.
Maximum Buffer Size	The maximum buffer size allocated for the buffering agent per bearer.
Buffer Duration	The duration for which the buffering agent stores data before discarding it.
Maximum Packets Per Buffer	The maximum number of packets allowed per buffer.

Buffering Status

The Buffering Status pane shows:

Field	Description
Total In Use Buffers	Count— Total number of buffers currently in use.
Total Buffered Packets	Count—Total number of packets buffered at present in the buffer.
Total Buffered Bits	Count—Total number of bits buffered at present in the buffer.
Total Buffers Available	Count—Current available buffer size.

Buffering Statistics

The Buffering Statistics pane shows:

Field	Description
Buffers Created	• Count—Total number of buffers created. • Rate—Rate at which the buffers are created.
Buffers Deleted	• Count—Total number of buffers deleted. • Rate—Rate at which the buffers are deleted.
Buffer Rejected Low Memory	• Count—Total number of times the buffer allocation is rejected due to low memory availability in the gateway. • Rate—Rate at which the buffer allocation is rejected due to low memory availability in the gateway.
Buffers Timed Out	• Count—Total number of buffers that got timed out. • Rate—Rate at which the buffers got timed out.
Buffer Packets Enqueued	• Count—Total number of packets enqueued to the buffering agent. • Rate—Rate at which the packets are enqueued to the buffering agent.
Buffer Rejected Memory Unavailable	• Count—Total number of times the buffer allocation is rejected by gateway due to requested memory is greater than the total available buffers. • Rate—Rate at which the buffer allocation is rejected by gateway due to requested memory is greater than the total available buffers.
Buffer Packets Dequeued	• Count—Total number of packets dequeued from the buffering agent. • Rate—Rate at which the packets are dequeued from the buffering agent.
Buffer Bits Enqueued	• Count—Total bits of data enqueued to the buffering agent. • Rate—Rate at which the bits of data are enqueued to the buffering agent.
Buffer Bits Dequeued	• Count—Total bits of data dequeued from the buffering agent. • Rate—Rate at which the bits of data are dequeued from the buffering agent.

EPC Overload Protection

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the EPC Overload Protection Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

- Status Information, page 11-99
- Congestion Threshold Information, page 11-99
- Statistics Information, page 11-99
- Congestion Times, page 11-99

Status Information

The Status Information pane shows:

Field	Description
Congestion Status	The congestion gateway status.
Congestion DFP Weight	The dfp value, which is used to measure the congestion level in the gateway.

Congestion Threshold Information

The Congestion Threshold Information pane shows:

Field	Description
Congestion Low Threshold %	The low threshold for congestion.
Congestion High Threshold %	The high threshold for congestion.

Statistics Information

The Statistics Information pane shows:

Field	Description
Call Requests Dropped	• Count—Total number of incoming calls dropped at the gateway. • Rate—Rate at which the incoming calls are dropped at the gateway.
Times High Congestion Reached	• Count—The number of times high congestion occurred on the gateway. • Rate—Rate at which the high congestion occurred on the gateway.
Times Low Congestion Reached	• Count—The number of times low congestion occurred on the gateway. • Rate—Rate at which the low congestion are occurred on the gateway.

Congestion Times

The Congestion Times pane shows:

Field	Description
Congestion Low	• Last Occurrence—Timestamp at which the low congestion last occurred on the gateway. • Last Duration—Duration of last low congestion.
Congestion High	• Last Occurrence—Timestamp at which the high congestion last occurred on the gateway. • Last Duration—Duration of last high congestion.

GTP Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTP Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

GTP Active Statistics

The GTP Statistics pane shows:

Column	Description
Active Bearers	Count—Total number of active bearers.
Active Sessions	Count—Total number of active sessions.
Active Users	Count—The number of currently active users.
Idle Users	Count—The number of currently idle users.
Suspended Users	Count—Total number of suspended users.

Charging Statistics

The Charging Statistics pane shows:

Field	Description
Current Open CDRs	• Count—The number of currently opened G-CDRs on the SGW. • Rate—Rate of currently opened G-CDRs on the SGW.
Current Closed CDRs	• Count—The number of currently closed G-CDRs on the SGW which have not been sent to the CG. • Rate—Rate of currently closed G-CDRs on the SGW which have not been sent to the CG.
Current Containers	• Count—The number of currently open or closed charging containers. • Rate—Rate of currently open or closed charging containers.
CDR Messages Pending	• Count—The number of currently pending G-CDR output messages. • Rate—Rate of currently pending G-CDR output messages.

Field	Description
CDR Messages Sent	• Count—The number of transmitted G-CDR output messages since the charging service is enabled. • Rate—Rate of transmitted G-CDR output messages since the charging service is enabled.
CDRs Opened	• Count—Total number of CDRs opened on the SGW either since system startup or since the last time the charging statistics was cleared. • Rate—Rate of CDRs opened on the SGW either since system startup or since the last time the charging statistics was cleared.
Containers Created	• Count—Total number of containers created on the SGW either since system startup or since the last time the charging statistics was cleared. • Rate—Rate of containers created on the SGW either since system startup or since the last time the charging statistics was cleared.
Service Records Created	• Count—Total number of service records created on the SGW either since the system startup or since the time the service aware feature is enabled. • Rate—Rate of service records created on the SGW either since the system startup or since the time the service aware feature is enabled.
Total Unique APNs	• Count—The number of access points for which charging data is being collected. • Rate—Rate of access points for which charging data is being collected.
Charging Gateway Down Times	• Count—The number of occurrences of cgprsCgAlarmEchoFailure traps state transitions since system startup. • Rate—Rate of occurrences of cgprsCgAlarmEchoFailure traps state transitions since system startup.

GTP Bearer Statistics

The GTP PDP/Bearer Statistics pane shows:

Column	Description
Bearer Activation Failure Ratio	• Count—Ratio of bearer activation request to bearer activation failures. • Rate—Rate (per second) of ratio of bearer activation request to bearer activation failures.
Bearers Created	• Count—Number of bearers created since the system is up. • Rate—Rate at which the bearers are created since the system is up.
Bearers Rejected	• Count—Number of bearers rejected since the system is up. • Rate—Rate at which the bearers are rejected since the system is up.
Bearers Deleted	• Count—Number of bearers deleted since the system is up • Rate—Rate at which the bearers are deleted since the system is up.

GTP Throughput Statistics

The GTP Throughput Statistics pane displays count and rate statistics about GTP throughput and shows:

Column	Description
GTP signaling Messages Sent	• Count—Number of signaling messages sent on a SGSN path. • Rate—Rate at which the signaling messages are sent on a SGSN path.
GTP Signaling Messages Received	• Count—Number of signaling messages received on a SGSN path. • Rate—Rate at which the signaling messages are received on a SGSN path.
G-PDU Messages Sent	• Count—Number of PDU messages sent on a SGSN path. • Rate—Rate at which the PDU messages are sent on a SGSN path.
G-PDU Messages Received	• Count—Number of PDU messages received on a SGSN path. • Rate—Rate at which the PDU messages are received on a SGSN path.
G-PDU Bits Sent	• Count—Number of PDU bits sent in PDU message on a SGSN path. • Rate—Rate at which the PDU bits are sent in PDU message on a SGSN path.
G-PDU Bits Received	• Count—Number of PDU bits received in PDU message on a SGSN path. • Rate—Rate at which the PDU bits are received in PDU message on a SGSN path.

GTP Throughput Statistics Ext

The GTP Throughput Statistics Ext pane shows:

Field	Description
GTP Packets	GTP packets between the SGW and SGSN.
GTP Bytes	GTP bytes between the SGW and SGSN.
Sampling Interval in Minutes: 3	Global GTP throughput statistics on the SGW for a duration of 3 minutes.
Sampling Interval in Minutes: 5	Global GTP throughput statistics on the SGW for a duration of 5 minutes.
Upstream	Rate (per second) of upstream GTP traffic during the last sampling period.
Downstream	Rate (per second) of downstream GTP traffic during the last sampling period.
Data age (minutes)	The difference in minutes between the time when the data was collected and retrieved. This is the time that has elapsed after the previous collection or update of the data.

GTP Error Statistics

The GTP Error Statistics pane shows:

Column	Description
GTP Messages with Parser Errors	• Count—Number of GTP messages received with wrong value. • Rate—Rate (per second) of GTP messages received with wrong value.
Dropped Signaling Messages	• Count—Number of signaling packets dropped by SGW. • Rate—Rate at which the signaling packets are dropped by SGW.
Unexpected GTP Signaling Messages	• Count—Number of unexpected GTP signaling messages received. • Rate—Rate at which the unexpected GTP signaling messages are received.

GTPv2 Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTPv2 Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

- GTPv2 Bearer Statistics, page 11-103
- GTPv2 Session Statistics, page 11-104

GTPv2 Bearer Statistics

The GTPv2 Bearer Statistics pane shows:

Field	Description
Delete Bearer Responses	Total number of delete bearer response messages.
Update Bearer Requests	Total number of update bearer request messages.
Modify Bearer Requests	Total number of modify bearer request messages.
Create Bearer Requests	Total number of create bearer request messages.
Sent	• Count—Total number of bearer response or bearer request messages sent. • Rate—Rate at which the bearer response or bearer request messages are sent.
Received	• Count—Total number of bearer response or bearer request messages received. • Rate—Rate at which the bearer response or bearer request messages are received.
Rejected	• Count—Total number of bearer response or bearer request messages rejected. • Rate—Rate at which the bearer response or bearer request messages are rejected.

GTPv2 Session Statistics

The GTPv2 Session Statistics pane shows:

Field	Description
Delete Session Responses	Total number of delete session response messages.
Create Session Responses	Total number of create session response messages.
Delete Session Requests	Total number of delete session request messages.
Create Session Requests	Total number of create session request messages.
Sent	• Count—Total number of session response or session request messages sent. • Rate—Rate at which the session response or session request messages are sent.
Received	• Count—Total number of session response or session request messages received. • Rate—Rate at which the session response or session request messages are received.
Rejected	• Count—Total number of session response or session request messages rejected. • Rate—Rate at which the session response or session request messages are rejected.

GTPv2 Path Bearer Requests Statistics

The GUI displays the same fields as that of GTPv2 Path Bearer Requests Statistics for PDNGW node. See GTPv2 Path Bearer Requests Statistics, page 11-114.

GTPv2 Path Bearer Responses Statistics

The GUI displays the same fields as that of GTPv2 Path Bearer Requests Statistics for PDNGW node. See GTPv2 Path Bearer Responses Statistics, page 11-115.

GTPv2 Path Session Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTPv2 Path Session Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
GTP Path	GTP path.
Create Requests Sent	• Count—Total number of create session request messages sent. • Rate—Rate at which the create session request messages are sent.
Create Requests Received	• Count—Total number of create session request messages received. • Rate—Rate at which the create session request messages are received.

Field	Description
Create Requests Rejected	• Count—Total number of create session request messages rejected. • Rate—Rate at which the create session request messages are rejected.
Delete Requests Sent	• Count—Total number of delete session request messages sent. • Rate—Rate at which the delete session request messages are sent.
Delete Requests Received	• Count—Total number of delete session request messages received. • Rate—Rate at which the delete session request messages are received.
Delete Requests Rejected	• Count—Total number of delete session request messages rejected. • Rate—Rate at which the delete session request messages are rejected.
Create Responses Sent	• Count—Total number of create session response messages sent. • Rate—Rate at which the create session response messages are sent.
Create Responses Received	• Count—Total number of update session response messages received. • Rate—Rate at which the update session response messages are received.
Create Responses Rejected	• Count—Total number of update session response messages rejected • Rate—Rate at which the update session response messages are rejected.
Delete Responses Sent	• Count—Total number of delete session response messages sent. • Rate—Rate at which the delete session response messages are sent.
Delete Responses Received	• Count—Total number of delete session response messages received • Rate—Rate at which the delete session response messages are received.
Delete Responses Rejected	• Count—Total number of delete session response messages rejected. • Rate—Rate at which the delete session response messages are rejected.

GTP Path Error Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTP Path Error Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
GTP Path	GTP path.
Signaling Messages	**Unexpected** • Count—Number of unexpected GTP signaling messages sent or received. • Rate—Rate at which the unexpected GTP signaling messages are sent or received. **Dropped** • Count—Number of signaling messages that are dropped. • Rate—Rate at which the signaling messages are dropped.

IP Local Pool Configuration

The GUI displays the same fields as that of IP Local Pool Configuration statistics for GGSN node. See IP Local Pool Config, page 11-86.

IP Local Pool Statistics

The GUI displays the same fields as that of IP Local Pool statistics for GGSN node. See IP Local Pool Stats, page 11-87.

Displaying PDNGW Real time statistics

The MWTM enables you to display real-time statistics for PDNGW nodes in the MWTM web interface. To display real-time statistics, select the node in the navigation tree and click the Statistics tab. These options appear under the Type drop down list:

AAA

The GUI displays the same fields as that of AAA Statistics for SGW node. See AAA, page 11-93.

APN Instance Throughput

The GUI displays the same fields as that of APN Instance Throughput Statistics for SGW node. See APN Instance Throughput, page 11-95.

APN Instance Throughput Ext

The GUI displays the same fields as that of APN Instance Throughput Ext Statistics for SGW node. See APN Instance Throughput Ext, page 11-95.

APN Instance PDP/Bearer

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance PDP/Bearer Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Active PDP/Bearers	• Count—Number of active PDP contexts or Bearers on this APN.
PDP/Bearer Activations by MS Success	• Count—Total number of successfully completed PDP context/Bearer activation procedures by the MS on this APN. • Rate—Rate (per second) of successfully completed PDP context/Bearer activation procedures by the MS on this APN. • Ratio—Number of successful activations for every 100 activation attempts.
PDP/Bearer Activations by MS Failure	• Count—Total number of failed PDP context/Bearer activation procedures by the MS on this APN. • Rate—Rate (per second) of failed PDP context/Bearer activation procedures by the MS on this APN.
PDP/Bearer Deactivations by Network Success	• Count—Total number of successfully completed PDP context/Bearer deactivation procedures by the PDNGW on this APN. • Rate—Rate (per second) of successfully completed PDP context/Bearer deactivation procedures by the PDNGW on this APN.
PDP/Bearer Deactivations by Network Failure	• Count—Total number of failed PDP context/Bearer deactivation procedures by the PDNGW on this APN. • Rate—Rate (per second) of failed PDP context/Bearer deactivation procedures by the PDNGW on this APN.
PDP/Bearer Retainability	• Ratio—For every 100 PDP contexts/Bearers, the number of activations whose deactivation was not completed by the network.

Field	Description
PDP/Bearer Deactivations by MS Success	• Count—Total number of successfully completed PDP context/Bearer deactivation procedures by the MS on this APN. • Rate—Rate (per second) of successfully completed PDP context/Bearer deactivation procedures by the MS on this APN. • Ratio—Number of successful deactivations for every 100 deactivation attempts.
PDP/Bearer Deactivations by MS Failure	• Count—Total number of failed PDP context/Bearer deactivation procedures by the MS on this APN. • Rate—Rate (per second) of failed PDP context/Bearer deactivation procedures by the MS on this APN.

APN Instance PDP/Bearer Ext

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance PDP/Bearer Ext Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
APN Name	The name of the Access Point Name (APN).
APN Index	A unique numerical identifier for the APN.
Dynamic PDP/Bearer Activations By MS Success	• Count—Total number of successfully completed dynamic PDP context/Bearer activation procedures by the MS on this APN. • Rate—Rate (per second) of successfully completed dynamic PDP context/Bearer activation procedures by the MS on this APN. • Ratio—Number of successful dynamic activations for every 100 dynamic activation attempts.
Dynamic PDP/Bearer Activations By MS Failure	• Count—Total number of failed dynamic PDP context/Bearer activation procedures by the MS on this APN. • Rate—Rate (per second) of failed dynamic PDP context/Bearer activation procedures by the MS on this APN.
PDP/Bearer Activations By Network Success	• Count—Total number of successfully completed network initiated PDP context/Bearer activation procedures. • Rate—Rate (per second) successfully completed network initiated PDP context/Bearer activation procedures. • Ratio—number of successful network initiated activations for every 100 activation attempts.
PDP/Bearer Activations By Network Failure	• Count—Total number of failed network initiated PDP context/Bearer activation procedures. • Rate—Rate (per second) failed network initiated PDP context/Bearer activation procedures.
PDP/Bearer Updates By Network Success	• Count—Total number of successful update responses received on this APN. • Rate—Rate (per second) of successful update responses received on this APN. • Ratio—Number of successful update responses received for every 100 activation attempts.

Field	Description
PDP/Bearer Updates By Network Failure	• Count—Total number of unsuccessful update responses received on this APN. • Rate—Rate (per second) of unsuccessful update responses received on this APN.
Dedicated Bearer Activations Success	• Count—Total number of successful dedicated bearer activation procedures received on this APN. • Rate—Rate (per second) of successful dedicated bearer activation procedures received on this APN. • Ratio—Number of successful dedicated bearer activation procedures for every 100 activation attempts.
Dedicated Bearer Activations Failure	• Count—Total number of unsuccessful dedicated bearer activation procedures received on this APN. • Rate—Rate (per second) of unsuccessful dedicated bearer activation procedures received on this APN.

APN Instance Miscellaneous

The GUI displays the same fields as that of APN instance Miscellaneous Statistics for GGSN node. See APN Instance Miscellaneous, page 11-85.

EPC Buffering

The GUI displays the same fields as that of EPC Buffering Statistics for SGW node. See EPC Buffering, page 11-97.

EPC Overload Protection

The GUI displays the same fields as that of EPC Overload protection Statistics for SGW node. See EPC Overload Protection, page 11-98.

GTP Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTP Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

- GTP Active Statistics, page 11-110
- Charging Statistics, page 11-110
- GTP PDP/Bearer Statistics, page 11-111
- GTP Throughput Statistics, page 11-111
- GTP Throughput Statistics Ext, page 11-102
- GTP Error Statistics, page 11-113

GTP Active Statistics

The GTP Active Statistics pane shows:

Column	Description
GTP v0 PDP Contexts	PDP contexts (GTP version 0) that are active.
GTP v1 PDP Contexts	PDP contexts (GTP version 1) that are active.
Active Bearers	Count—Total number of bearers on this GTP.
PPP Regen PDPs	Device-specific interfaces created for association with PDP contexts regenerated to a Point-to-Point (PPP) session.
PPP PDPs	Total number of point to point PDP contexts.
PDP Contexts with Direct Tunnel	Direct tunnels enabled for the PDP contexts in the PDNGW.
Active Sessions	Total number of active sessions.

Charging Statistics

The Charging Statistics pane shows:

Field	Description
Current Open CDRs	• Count—The number of currently opened G-CDRs on the PDNGW. • Rate—Rate of currently opened G-CDRs on the PDNGW.
Current Closed CDRs	• Count—The number of currently closed G-CDRs on the PDNGW which have not been sent to the CG. • Rate—Rate of currently closed G-CDRs on the PDNGW which have not been sent to the CG.
Current Containers	• Count—The number of currently open or closed charging containers. • Rate—Rate of currently open or closed charging containers.
CDR Messages Pending	• Count—The number of currently pending G-CDR output messages. • Rate—Rate of currently pending G-CDR output messages.
CDR Messages Sent	• Count—The number of transmitted G-CDR output messages since the charging service is enabled. • Rate—Rate of transmitted G-CDR output messages since the charging service is enabled.
CDRs Opened	• Count—Total number of CDRs opened on the PDNGW either since system startup or since the last time the charging statistics was cleared. • Rate—Rate of CDRs opened on the PDNGW either since system startup or since the last time the charging statistics was cleared.

Field	Description
Containers Created	• Count—Total number of containers created on the PDNGW either since system startup or since the last time the charging statistics was cleared. • Rate—Rate of containers created on the PDNGW either since system startup or since the last time the charging statistics was cleared.
Service Records Created	• Count—Total number of service records created on the PDNGW either since the system startup or since the time the service aware feature is enabled. • Rate—Rate of service records created on the PDNGW either since the system startup or since the time the service aware feature is enabled.
Total Unique APNs	• Count—The number of access points for which charging data is being collected. • Rate—Rate of access points for which charging data is being collected.
Charging Gateway Down Times	• Count—The number of occurrences of cgprsCgAlarmEchoFailure traps state transitions since system startup. • Rate—Rate of occurrences of cgprsCgAlarmEchoFailure traps state transitions since system startup.

GTP PDP/Bearer Statistics

The GTP Bearer Statistics pane shows:

Column	Description
PDP/Bearer Context Activation Failure Ratio	• Count—Ratio of PDP/bearer activation request to bearer activation failures. • Rate—Rate (per second) of ratio of PDP/bearer activation request to bearer activation failures.
PDP/Bearer Contexts Created	• Count—Number of PDP/bearers created since the system is up. • Rate—Rate at which the PDP/bearers are created since the system is up.
PDP/Bearer Context Activations Rejected	• Count—Number of PDP/bearer activation requests rejected since the system is up. • Rate—Rate at which the PDP/bearer activation requests are rejected since the system is up.
PDP/Bearer Contexts Deleted	• Count—Number of PDP/bearers deleted since the system is up • Rate—Rate at which the PDP/bearers are deleted since the system is up.

GTP Throughput Statistics

The GTP Throughput Statistics pane displays count and rate statistics about GTP throughput and shows:

Column	Description
GTP Signaling Messages Sent	• Count—Number of signaling messages sent on a SGSN path. • Rate—Rate at which the signaling messages are sent on a SGSN path.
GTP Signaling Messages Received	• Count—Number of signaling messages received on a SGSN path. • Rate—Rate at which the signaling messages are received on a SGSN path.
G-PDU Messages Sent	• Count—Number of PDU messages sent on a SGSN path. • Rate—Rate at which the PDU messages are sent on a SGSN path.
G-PDU Messages Received	• Count—Number of PDU messages received on a SGSN path. • Rate—Rate at which the PDU messages are received on a SGSN path.
G-PDU Bits Sent	• Count—Number of PDU bits sent in PDU message on a SGSN path. • Rate—Rate at which the PDU bits are sent in PDU message on a SGSN path.
G-PDU Bits Received	• Count—Number of PDU bits received in PDU message on a SGSN path. • Rate—Rate at which the PDU bits are received in PDU message on a SGSN path.

GTP Throughput Statistics Ext

The GTP Throughput Statistics Ext pane shows:

Field	Description
GTP Packets	GTP packets between the PDNGW and SGSN.
GTP Bytes	GTP bytes between the PDNGW and SGSN.
Sampling Interval in Minutes: 3	Global GTP throughput statistics on the PDNGW for a duration of 3 minutes.
Sampling Interval in Minutes: 5	Global GTP throughput statistics on the PDNGW for a duration of 5 minutes.
Upstream	Rate (per second) of upstream GTP traffic during the last sampling period.
Downstream	Rate (per second) of downstream GTP traffic during the last sampling period.
Data age (minutes)	The difference in minutes between the time when the data was collected and retrieved. This is the time that has elapsed after the previous collection or update of the data.

GTP Error Statistics

The GTP Error Statistics pane shows:

Column	Description
PDP Context Activations Rejected due to Insufficient Resources	• Count—Number of PDP context requests rejected due to insufficient resources. • Rate—Rate at which the PDP context requests are rejected due to insufficient resources.
PDP Context Requests Rejected due to Insufficient Resources Rejection for PPP Regeneration	• Count—Number of PDP context requests rejected due to insufficient resources for PPP regeneration. • Rate—Rate at which the PDP context requests are rejected due to insufficient resources for PPP regeneration.
PDP Context Requests Dropped due to the PPP Regeneration Threshold Limit	• Count—Number of PDP context requests dropped due to the PPP regeneration threshold limit. • Rate—Rate at which the PDP context requests are dropped due to the PPP regeneration threshold limit.
PDP Context Messages with Packet Filter Semantic Errors	• Count—Total number of received PDP context messages that had packet filters with semantic errors. • Rate—Rate at which the PDP context messages that had packet filters with semantic errors are received.
PDP Context Messages with Packet Filter Syntax Errors	• Count—Total number of received PDP context messages that had packet filters with syntax errors. • Rate—Rate at which the PDP context messages that had packet filters with syntax errors are received.
PDP Context Messages with TFT Syntax Errors	• Count—Total number of received PDP context messages that had Traffic Flow Templates (TFT) with syntax errors. • Rate—Rate at which the PDP context messages that had Traffic Flow Templates (TFT) with syntax errors are received.
PDP Context Messages with TFT Semantic Errors	• Count—Total number of received PDP context messages that had Traffic Flow Templates (TFT) with semantic errors. • Rate—Rate at which the PDP context messages that had Traffic Flow Templates (TFT) with semantic errors are received.
Unexpected GTP Signaling Messages	• Count—Number of unexpected GTP signaling messages sent or received. • Rate—Rate at which the unexpected GTP signaling messages are sent or received.
Dropped GTP Signaling Messages	• Count—Number of dropped GTP signaling messages. • Rate—Rate at which the GTP signaling messages are dropped.
GTP Message Parsers Errors	• Count—Number of GTP messages received with wrong value. • Rate—Rate at which the GTP messages with wrong value are received.

GTPv2 Statistics

The GUI displays the same fields as that of GTPv2 Statistics for SGW node. See GTPv2 Statistics, page 11-103.

GTPv2 Path Bearer Requests Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTPv2 Path Bearer Requests Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
GTP Path	GTP path.
Create Requests Sent	• Count—Total number of create bearer request messages sent. • Rate—Rate at which the create bearer request messages are sent.
Create Requests Received	• Count—Total number of create bearer request messages received. • Rate—Rate at which the create bearer request messages are received.
Create Requests Rejected	• Count—Total number of create bearer request messages rejected. • Rate—Rate at which the create bearer request messages are rejected.
Modify Requests Sent	• Count—Total number of modify bearer request messages sent. • Rate—Rate at which the modify bearer request messages are sent.
Modify Requests Received	• Count—Total number of modify bearer request messages received. • Rate—Rate at which the modify bearer request messages are received.
Modify Requests Rejected	• Count—Total number of modify bearer request messages rejected. • Rate—Rate at which the modify bearer request messages are rejected.
Update Requests Sent	• Count—Total number of update bearer request messages sent. • Rate—Rate at which the update bearer request messages are sent.
Update Requests Received	• Count—Total number of update bearer request messages received. • Rate—Rate at which the update bearer request messages are received.
Update Requests Rejected	• Count—Total number of update bearer request messages rejected. • Rate—Rate at which the update bearer request messages are rejected.
Delete Requests Sent	• Count—Total number of delete bearer request messages sent. • Rate—Rate at which the delete bearer request messages are sent.
Delete Requests Received	• Count—Total number of delete bearer request messages received. • Rate—Rate at which the delete bearer request messages are received.
Delete Requests Rejected	• Count—Total number of delete bearer request messages rejected. • Rate—Rate at which the delete bearer request messages are rejected.

GTPv2 Path Bearer Responses Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTPv2 Path Bearer Responses Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
GTP Path	GTP path.
Create Responses Sent	• Count—Total number of create bearer response messages sent. • Rate—Rate at which the create bearer response messages are sent.
Create Responses Received	• Count—Total number of create bearer response messages received. • Rate—Rate at which the create bearer response messages are received.
Create Responses Rejected	• Count—Total number of create bearer response messages rejected. • Rate—Rate at which the create bearer response messages are rejected.
Modify Responses Sent	• Count—Total number of modify bearer response messages sent. • Rate—Rate at which the modify bearer response messages are sent.
Modify Responses Received	• Count—Total number of modify bearer response messages received. • Rate—Rate at which the modify bearer response messages are received.
Modify Responses Rejected	• Count—Total number of modify bearer response messages rejected. • Rate—Rate at which the modify bearer response messages are rejected.
Update Responses Sent	• Count—Total number of update bearer response messages sent. • Rate—Rate at which the update bearer response messages are sent.
Update Responses Received	• Count—Total number of update bearer response messages received. • Rate—Rate at which the update bearer response messages are received.
Update Responses Rejected	• Count—Total number of update bearer response messages rejected. • Rate—Rate at which the update bearer response messages are rejected.
Delete Responses Sent	• Count—Total number of delete bearer response messages sent. • Rate—Rate at which the delete bearer response messages are sent.
Delete Responses Received	• Count—Total number of delete bearer response messages received. • Rate—Rate at which the delete bearer response messages are received.
Delete Responses Rejected	• Count—Total number of delete bearer response messages rejected. • Rate—Rate at which the delete bearer response messages are rejected.

GTPv2 Path Session Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTPv2 Path Session Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
GTP Path	GTP path.
Create Requests Received	• Count—Total number of create session request messages received. • Rate—Rate at which the create session request messages are received.
Create Requests Rejected	• Count—Total number of create session request messages rejected. • Rate—Rate at which the create session request messages are rejected.
Delete Requests Received	• Count—Total number of delete session request messages received. • Rate—Rate at which the delete session request messages are received.
Delete Requests Rejected	• Count—Total number of delete session request messages rejected. • Rate—Rate at which the delete session request messages are rejected.
Create Responses Sent	• Count—Total number of create session response messages sent. • Rate—Rate at which the create session response messages are sent.
Delete Responses Sent	• Count—Total number of delete session response messages sent. • Rate—Rate at which the delete session response messages are sent.

GTP Path Error Statistics

The GUI displays the same fields as that of GTP Path Error Statistics for SGW node. See GTP Path Error Statistics, page 11-105.

IP Local Pool Configuration

The GUI displays the same fields as that of IP Local Pool Configuration statistics for GGSN node. See IP Local Pool Config, page 11-86.

IP Local Pool Statistics

The GUI displays the same fields as that of IP Local Pool statistics for GGSN node. See IP Local Pool Stats, page 11-87.

Displaying SPGW Real time statistics

The MWTM enables you to display real-time statistics for SPGW nodes in the MWTM web interface. To display real-time statistics, select the node in the navigation tree and click the Statistics tab. These options appear under the Type drop down list:

- AAA, page 11-117
- APN Instance Throughput, page 11-117

AAA

The GUI displays the same fields as that of AAA Statistics for SGW node. See AAA, page 11-93.

APN Instance Throughput

The GUI displays the same fields as that of APN Instance Throughput Statistics for SGW node. See APN Instance Throughput, page 11-95.

APN Instance Throughput Ext

The GUI displays the same fields as that of APN Instance Throughput Ext Statistics for SGW node. See APN Instance Throughput Ext, page 11-95.

APN Instance Bearer

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance Bearer statistics table, choose this option from the Type drop-down menu. See APN Instance Bearer, page 11-96.

APN Instance PDP/Bearer

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance PDP/Bearer Statistics table, choose this option from the Type drop-down menu. See APN Instance PDP/Bearer, page 11-107.

APN Instance PDP/Bearer Ext

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the APN Instance PDP/Bearer Ext Statistics table, choose this option from the Type drop-down menu. See APN Instance PDP/Bearer Ext, page 11-108.

APN Instance Miscellaneous

The GUI displays the same fields as that of APN instance Miscellaneous Statistics for GGSN node. See APN Instance Miscellaneous, page 11-85.

EPC Buffering

The GUI displays the same fields as that of EPC Buffering Statistics for SGW node. See EPC Buffering, page 11-97.

EPC Overload Protection

The GUI displays the same fields as that of EPC Overload protection Statistics for SGW node. See EPC Overload Protection, page 11-98.

GTP Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTP Statistics table, choose this option from the Type drop-down menu. The GUI displays the following categories:

- GTP Active Statistics, page 11-119
- Charging Statistics, page 11-110

- GTP PDP/Bearer Statistics, page 11-111
- GTP Throughput Statistics, page 11-111
- GTP Throughput Statistics Ext, page 11-102
- GTP Error Statistics, page 11-113

GTP Active Statistics

The GTP Active Statistics pane shows:

Column	Description
GTP v0 PDP Contexts	PDP contexts (GTP version 0) that are active.
GTP v1 PDP Contexts	PDP contexts (GTP version 1) that are active.
Active Bearers	Count—Total number of bearers on this APN.
Active Sessions	Total number of active sessions.
PPP Regen PDPs	Device-specific interfaces created for association with PDP contexts regenerated to a Point-to-Point (PPP) session.
PPP PDPs	Total number of point to point PDP contexts.
PDP Contexts with Direct Tunnel	Direct tunnels enabled for the PDP contexts in the SPGW.
Active Users	Count—The number of currently active users.
Idle Users	Count—The number of currently idle users.
Suspended Users	Count—Total number of suspended users.

GTPv2 Statistics

The GUI displays the same fields as that of GTPv2 Statistics for SGW node. See GTPv2 Statistics, page 11-103.

GTPv2 Path Bearer Requests Statistics

The GUI displays the same fields as that of GTPv2 Path Bearer Requests Statistics for PDNGW node. See GTPv2 Path Bearer Requests Statistics, page 11-114.

GTPv2 Path Bearer Responses Statistics

The GUI displays the same fields as that of GTPv2 Path Bearer Responses Statistics for PDNGW node. See GTPv2 Path Bearer Responses Statistics, page 11-115.

GTPv2 Path Session Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the GTPv2 Path Session Statistics table, choose this option from the Type drop-down menu. See GTPv2 Path Session Statistics, page 11-115.

GTP Path Error Statistics

The GUI displays the same fields as that of GTP Path Error Statistics for SGW node. See GTP Path Error Statistics, page 11-105.

IP Local Pool Configuration

The GUI displays the same fields as that of IP Local Pool Configuration statistics for GGSN node. See IP Local Pool Config, page 11-86.

IP Local Pool Statistics

The GUI displays the same fields as that of IP Local Pool statistics for GGSN node. See IP Local Pool Stats, page 11-87.

Displaying QoS Statistics

You can view QOS real-time statistics for IP-RAN aggregation and cell-site routers that have both pseudo wires and RAN Optimized backhauls. To view QOS real-time statistics for one of these nodes, select the node in the navigation tree, then click the QoS tab.

The following options appear under View drop-down menu:

- Config, page 11-121
- Class Map, page 11-121
- Queuing, page 11-121
- Match Statement, page 11-122
- Packet Marking, page 11-122
- Traffic Shaping, page 11-123
- Policing, page 11-124

Config

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Config details, choose Config option from the View drop-down menu. The GUI displays a bullet list/tree of the QOS configuration.

Class Map

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Class Map Statistics table, choose Class Map option from the View drop-down menu. The GUI displays:

Column	Description
Class Map	User-defined traffic class that contains one or many match statements used to classify packets into different categories.
Service Policy Direction	The direction of traffic for which the service policy is applied.
Pre-Policy Packets	The number of inbound packets prior to executing any QoS policies.
Pre-Policy Bits	The number of inbound octets prior to executing any QoS policies.
Pre-Policy Bits Rate	The rate of the traffic prior to executing any QoS policies.
Post-Policy Bits	The number of outbound octets after executing QoS policies.
Post-Policy Bits Rate	The rate of the traffic after executing QoS policies
Dropped Packets	The number of dropped packets per class as the result of all features that can produce drops.
Dropped Bits	The number of dropped bits per class as the result of all features that can produce drops.
Drop Bits Rate	The rate of the drops per class as the result of all features that can produce drops.
SRAM Buffer Dropped Packets	The number of drop packet count which occurred due to a lack of SRAM buffers during output processing on an interface.

Queuing

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Queuing Statistics table, choose Queuing option from the View drop-down menu. The GUI displays:

Column	Description
Class Map	User-defined traffic class that contains one or many match statements used to classify packets into different categories.
Service Policy Direction	The direction of traffic for which the service policy is applied.
Queue Depth	The current depth of the queue.
Max Queue Depth	The maximum depth of the queue.
Queue Discarded Bits	The count of octets, associated with this class, that were dropped by queueing.
Queue Discarded Packets	The number of packets, associated with this class, that were dropped by queueing.

Match Statement

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Match Statement Statistics table, choose Match Statement option from the View drop-down menu. The GUI displays:

Column	Description
Class Map	User-defined traffic class that contains one or many match statements used to classify packets into different categories.
Service Policy Direction	The direction of traffic for which the service policy is applied.
Match Statement	The specific match criteria to identify packets for classification purposes.
Pre-Policy Packets	The number of inbound packets prior to executing any QoS policies.
Pre-Policy Bits	The number of inbound octets prior to executing any QoS policies.
Pre-Policy Bits Rate	The rate of the traffic prior to executing any QoS policies.

Packet Marking

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Packet Marking Statistics table, choose Packet Marking option from the View drop-down menu. The GUI displays:

Column	Description
Class Map	User-defined traffic class that contains one or many match statements used to classify packets into different categories.
Service Policy Direction	The direction of traffic for which the service policy is applied.
DSCP Packets	The number of packets whose DSCP field is marked by Set feature.
Precedence Packets	The number of packets whose Precedence field is marked by Set feature.
QOS Group Packets	The number of packets whose Qos Group field is marked by Set feature.
Frame Relay DE Packets	The number of packets whose Frame Relay DE Bit is marked by Set feature.
ATM CLP Packets	The number of packets whose ATM CLP Bit is marked by Set feature.
Layer 2 COS Packets	The number of packets whose Layer 2 Cos field is marked by Set feature.
MPLS Experimental Imposition Packets	The number of packets whose MPLS Experimental Imposition field is marked by Set feature.
Discard Class Packets	The number of packets whose Discard Class field is marked by Set feature.
MPLS Experimental Top Most Packets	The number of packets whose MPLS Experimental Top Most field is marked by Set feature.
SRP Priority Packets	The number of packets whose SRP Priority field is marked by Set feature.
DSCP Tunnel Packets	The number of packets whose DSCP Tunnel field is marked by Set feature.
Precedence Tunnel Packets	The number of packets whose Precedence Tunnel field is marked by Set feature.
Frame Relay FECN	The number of packets whose Frame Relay FECN BECN field is marked by Set feature.

Traffic Shaping

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Traffic Shaping Statistics table, choose this option from the View drop-down menu. The GUI displays:

Column	Description
Class Map	User-defined traffic class that contains one or many match statements used to classify packets into different categories.
Service Policy Direction	The direction of traffic for which the service policy is applied.
Active	The current traffic-shaping state. When traffic-shaping is enabled and the traffic rate exceeds the shape rate, traffic-shaping is considered to be active. Otherwise, it is considered inactive.
Queue Size	The current traffic-shaping queue depth in packets.
Delayed Bits	The number of octets that have been delayed.
Delayed Packets	The number of packets that have been delayed.
Dropped Bits	The number of octets that have been dropped during shaping.
Dropped Packets	The number of packets that have been dropped during shaping.

Policing

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Policing Statistics table, choose Policing option from the View drop-down menu. The GUI displays:

Column	Description
Class Map	User-defined traffic class that contains one or many match statements used to classify packets into different categories.
Service Policy Direction	The direction of traffic for which the service policy is applied.
Conformed Packets	The number of packets treated as conforming by the policing feature
Conformed Bits	The number of octets treated as conforming by the policing feature
Conformed Bits Rate	The rate of conforming traffic.
Exceeded Packets	The number of packets treated as non-conforming by the policing feature.
Exceeded Bits	The number of octets treated as non-conforming by the policing feature.
Exceeded Bits Rate	The rate of non-conforming traffic.
Violated Packets	The number of packets treated as violated by the policing feature.
Violated Bits	The number of octets treated as violated by the policing feature.
Violated Bits Rate	The rate of the violating traffic.

Displaying PWE3 Real-Time Statistics

The MWTM enables you to display PWE3 real-time statistics in the MWTM web interface. Because the MWTM client also displays these statistics and the GUIs for the web and client interfaces are so similar, the PWE3 real-time statistics are described in Viewing PWE3 Statistics, page 7-121.

Displaying TDM Real-Time Statistics

The MWTM enables you to display TDM real-time statistics in the MWTM web interface. Because the MWTM client also displays these statistics and the GUIs for the web and client interfaces are so similar, the TDM real-time statistics are described in Viewing TDM Statistics, page 7-107.

Displaying SLB Real time statistics

The MWTM enables you to display SLB real-time statistics in the MWTM web interface, for the mSEF devices that support 7600 supervisor card. To display SLB real-time statistics, select the mSEF node that supports 7600 supervisor card in the navigation tree and click the Statistics tab. These options appear under the Type drop-down menu:

- Virtual Servers, page 11-125
- Real Servers, page 11-126
- Server Farms, page 11-127
- Global Statistics, page 11-127
- DFP Agents, page 11-128
- DFP Real Servers, page 11-128

Virtual Servers

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Virtual Server statistics table, choose Virtual Servers option from the Type drop-down menu. The GUI displays:

Column	Description
Virtual Server Name	Name of the virtual server.
Protocol	Protocol for the virtual server.
IP Address	IP address of the virtual server.
Port	Port of the virtual server.
State	State of the virtual server.

Column	Description
Current Connections	Number of currently assigned connections being handled by this virtual server.
Total Connections	• Count—Number of assigned connections handled by the virtual server since the server was configured. • Rate—Rate at which the assigned connections are handled by the virtual server since the server was configured.
Server Farm	Name of the virtual server farm bound to the virtual server.

Real Servers

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Real server configuration and statistics table, choose Real Servers option from the Type drop-down menu. The GUI displays:

Column	Description
IP Address	IP Address of the real server.
Farm Name	Name of the server farm of the real server.
State	Current state of real server.
Current Connections	Number of assigned connections being handled by this real server.
Total Connections	• Count—Number of assigned connections handled by this real server since this server was configured. • Rate—Rate at which the assigned connections are handled by the real server since the server was configured.
Consecutive Connection Failures	Number of connection failures to this real server without a successful connection.
Total Connection Failures	• Count—Total number of times this real server has failed since the creation of this row. • Rate—Rate at which the real server has failed since the creation of this row.
Administrative Weight	User-configured weight of the real server for the load balancing algorithms.
Operational Weight	Actual operating weight of the real server used by the load-balancing algorithms.

Server Farms

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Server farm configuration and statistics table, choose Server Farm option from the Type drop-down menu. The GUI displays:

Column	Description
Farm Name	Name of the server farm.
Predictor	Load balancing algorithm in use by the server farm for its real servers for the local SLB entity.
NAT Setting	Type of NAT employed by the local SLB entity for servers in this server farm.
Number of Real Servers	Number of real servers in the server farm.
Bind ID	Identifies one or more server farms to which the real server belongs.

Global Statistics

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the Global Statistics table, choose this option from the Type drop-down menu. The GUI displays:

Field	Description
Assisted Switching Packets	• Count—Number of packets handled by SLB which are switched via the highest-performance switching path. • Rate—Rate at which the packets are handled by SLB which are switched via the highest-performance switching path.
Zombies	• Count—Number of TCP and UDP connections currently in the zombie state waiting for timers to expire. • Rate—Rate at which the TCP and UDP connections currently in the zombie state waiting for timers are expired.
Connections Reassigned	• Count—Number of TCP and UDP connections reassigned from one real server to another. • Rate—Rate at which the TCP and UDP connections are reassigned from one real server to another.
Connections Destroyed	• Count—Number of TCP and UDP connections destroyed by SLB, either by TCPIP teardown or timeout. • Rate—Rate at which the TCP and UDP connections are destroyed by SLB.

Field	Description
Connections Created	• Count—Number of TCP and UDP connections created since SLB was configured. • Rate—Rate at which the TCP and UDP connections are created since SLB is configured.
Unassisted Switching Packets	• Count—Number of packets forwarded by the Software Load Balancing manager's software. • Rate—Rate at which the packets are forwarded by the Software Load Balancing manager's software.
Connections Established	• Count—Number of connections established through SLB. • Rate—Rate at which the connections are established through SLB.

DFP Agents

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the DFP Agents statistics table, choose this option from the Type drop-down menu. The GUI displays:

Column	Description
IP Address	IP address of the DFP agent.
Port	Port number of DFP agent.
State	State of DFP agent.
Time Out	Time interval during which the agent must send at least one message to the manager.
Retry Count	Number of times the manager will attempt to re-establish a connection with the agent.
Agent Interval	Time interval before SLB retries connecting to a DFP agent.

DFP Real Servers

Note For toolbar details, see Using the Toolbar, page 11-6.

To view the DFP Real Servers statistics table, choose this option from the Type drop-down menu. The GUI displays:

Column	Description
IP Address	IP address of the DFP agent.
Protocol	Protocol of the real server.

Column	Description
Port	Port number of real server.
Bind ID	Identifies one or more server farms to which the real server belongs.
Real Weight	Weight of the real server reported from a DFP agent.

Displaying PCRF Real Time Statistics

The MWTM enables you to display PCRF real-time statistics in the MWTM web interface, for the PCRF devices. To display PCRF real-time statistics, select the PCRF node and click the Statistics tab. The following option appears under the Type drop-down menu:

- Host, page 11-129

Host

Note For toolbar details, see Using the Toolbar, page 11-6.

Note Host real-time table is displayed for a "PCRF" node if "HOST-RESOURCES-MIB" is present.

To view the Host statistics table, choose Host option from the Type drop-down menu. The GUI displays:

Column	Description
Storage Type	Name of the storage type.
Storage Description	Description of the storage.
Storage Size	Size of the storage.
Storage Used	Name of the storage used.
Storage Used %	Percentage of the storage used.
Storage Free %	Percentage of the storage free.
Storage Allocation Failures	List of storage allocation failures.