Understanding Detailed Object Functions

You can use the Cisco Mobile Wireless Transport Manager (MWTM) to view detailed information about any discovered MWTM object, including its associated objects, status, notes, alarms and events, and so on.

To display detailed information for an object:

Step 1 In the navigation tree of the MWTM main window, click the turner ⬚ beside a view.

Step 2 Click a node. The Details tab appears in the content pane (see Viewing Details, page 8-12).

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- Deploying a File Associated with an ITP Node or Signaling Point, page 8-9
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Note For details on viewing notes, see Viewing Notes, page 6-39.

The MWTM displays detailed tabular information in the content area for the chosen object. Tabs will vary depending on the chosen object.

For example, if you choose an ITP node, the ITP Node table for that node displays as shown in Figure 8-1.

Figure 8-1   Example—ITP Node Tabs
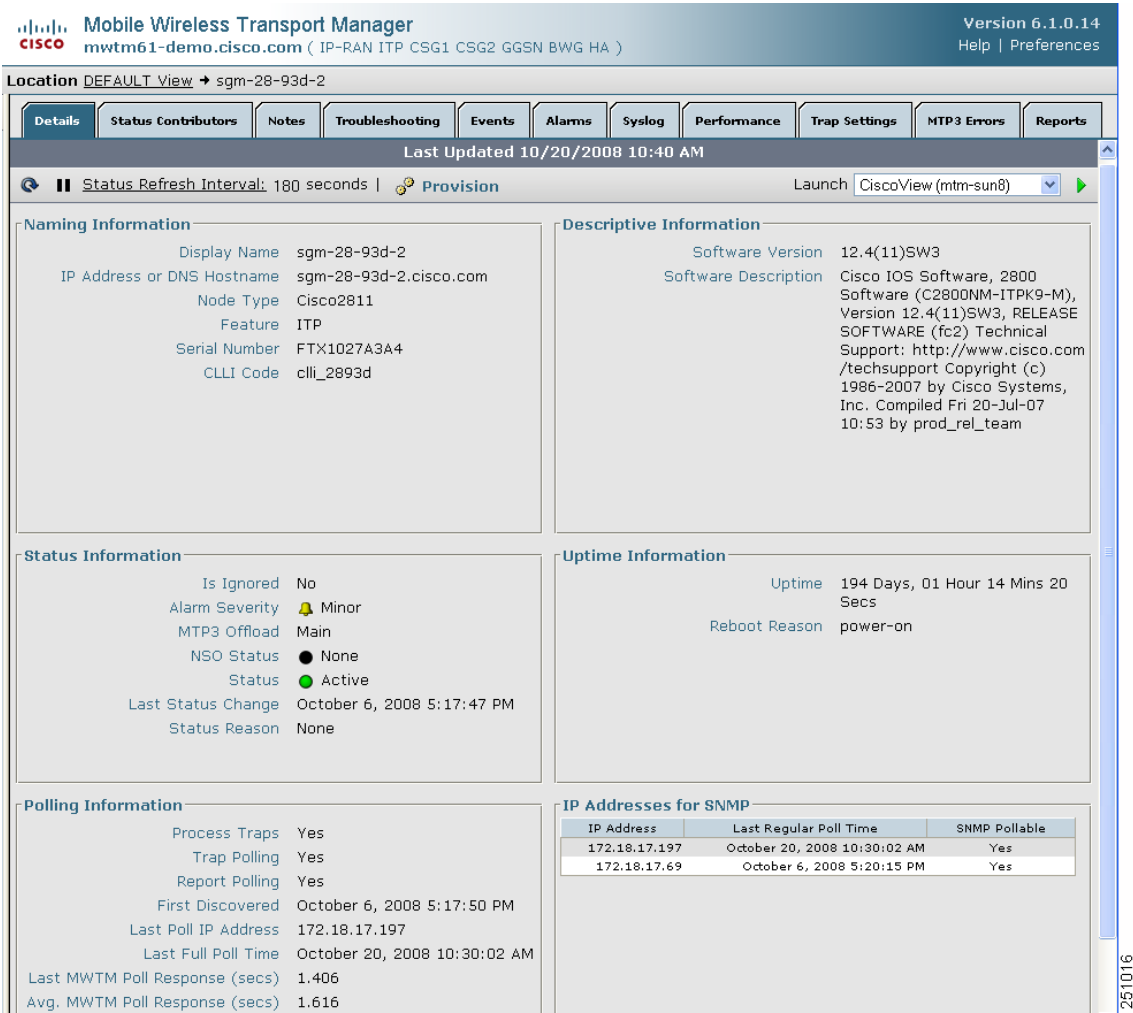
> **Note**   The tabs automatically reflect updates for the object from the MWTM server.

Viewing the Right-Click Menu for an Object

Right-clicking on any object in an MWTM view, summary list, or topology map provides you with numerous menu options.

Example:

To see the right-click menu for a node, select a node in the navigation tree and right-click the mouse button.

These right-click menu options might be available on a given MWTM object:

Menu Command	Description
Show In New Window	Opens the Details window for the chosen object in a new window.
Edit > Properties	Opens the Edit Properties dialog box for the chosen node or ITP signaling point.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 2) and higher.
Edit > Notes	Opens the Edit Notes dialog box for the chosen object.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 2) and higher.
Edit > SNMP IP Addresses	Opens the Edit SNMP IP Addresses dialog box for the chosen node.
	This option is dimmed if the chosen node has no associated SNMP IP addresses.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Administrator (level 4) and higher.
Edit > Route Table (ITP signaling points only)	Opens the Route Table dialog box, using a route table from the signaling point.
	This option is not available if the node associated with chosen signaling point is in Unknown or Unmanaged status.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Administrator (level 4) and higher.
Clear Event Icon	Deletes the event icon ⚠ from MWTM displays for the chosen object, for this MWTM client only. The MWTM does not delete the actual events, but deletes only the event icon for the chosen object for this MWTM client.
	This option is dimmed if the chosen object has no associated event icon.

Menu Command	Description
Delete	Deletes the currently chosen object from the MWTM database. The MWTM displays the Confirm Deletion dialog box. To: • Delete the chosen object, click **Yes**. The MWTM deletes the object from the MWTM database and closes the Confirm Deletion dialog box. • Retain the chosen object, click **No**. The MWTM retains the object in the MWTM database and closes the Confirm Deletion dialog box. **Note** (ITP only) If you delete all linksets to an Unmanaged node, the MWTM does not automatically delete the node. Instead, you must manually delete the node. See Deleting Objects, page 6-40 for more information. • Prevent the MWTM from displaying the Confirm Deletion dialog box, check the **Do not show this again** check box. **Note** If you check the Do not show this again check box, and later you decide you want the MWTM to begin displaying the Confirm Deletion dialog box again, you must check the Confirm Deletions check box in the General GUI settings in the Preferences window. For more information, see the description of the Confirm Deletions check box in Startup/Exit Settings, page 5-4. If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Administrator (level 4) and higher.
Go to > *Object*	Navigates to the parent or peer (if applicable) window(s) for the chosen object.
Back > *List of windows*	Navigates back to a window viewed in this session. The MWTM maintains a list of up to 10 Back windows.
Forward > *List of windows*	Navigates forward to a window viewed in this session. The MWTM maintains a list of up to 10 Forward windows.
Show Peer (only for RAN Backhauls and RAN Shorthauls)	Shows the peer of the RAN backhaul or shorthaul that you select in the right pane.
View > Status Contributors	Displays the Status Contributors pane for the chosen object. Objects in this pane contribute to the status of the chosen object.
View > Details	Displays the Details pane for the chosen object.
View > Notes	Displays the Notes pane for the chosen object. If no notes are associated with the chosen object, this option is dimmed.

Menu Command	Description
View > Troubleshooting	Displays the Troubleshooting pane for the chosen object.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Operator (level 3) and higher.
View > Recent Events	Displays the Recent Events pane for the chosen object and any associated network objects.
View > Alarms	Displays the Alarms pane for the chosen view.
View > Real-Time Data and Charts	Displays the MWTM Real-Time Statistics window for the chosen object.
	This option is not available if the object has no real-time charts or if the object status is Unknown or Unmanaged.
View > Center in Topo	Opens the topology window and displays the object in the center of the topology map.
View > Advanced Details (Web)	Opens the MWTM web client to display the Statistics tab for the selected object. This option appears only for those objects that have advanced details.
Archived Events > Status Changes	Displays the archived status changes in a web browser.
Archived Events > SNMP Traps	Displays the archived SNMP traps in a web browser.
Archived Events > Status Changes and SNMP Traps	Displays both the archived status changes and archived SNMP traps in a web browser.
Ignore	Ignores the chosen object at the next polling cycle.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 2) and higher.
Unignore	Stops ignoring the chosen object at the next polling cycle.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 2) and higher.
Performance History (RAN-O backhauls and shorthauls only)	Displays historical performance charts for the chosen RAN-O backhaul or shorthaul in a web browser.
Error History (RAN-O backhauls and shorthauls only)	Displays historical error charts for the chosen RAN-O backhaul or shorthaul in a web browser.
Create Virtual RAN Backhaul (RAN-O backhauls only)	Opens the Virtual RAN Backhaul Editor. For details, see Creating Virtual RAN Backhauls, page 8-140.
Drill-Down > *List of windows*	Opens a specific tab for the chosen object. Tabs listed start a poller.
	This option is not available if the node is in Unknown or Unmanaged status.

Menu Command	Description
Latest Reports	Opens the latest reports for the object in a Web browser. For details on reports, see Chapter 12, "Managing Reports."
	This option is not available if the node is in Unknown or Unmanaged status.
Provision	Opens the web interface to the Provision tab of the chosen object (see Using the Provisioning Wizard, page 8-50).
Launch	Use it to launch:
	• CiscoView
	• Device Center
	Note You must first integrate these applications with the MWTM. See Integrating the MWTM with CiscoWorks, page 5-39.

Menu Command	Description
These menu options are available on nodes or ITP signaling points:	
Node > Home Page	Displays the home page of the node in a new web browser window.
	This option does not appear in the right-click menu for Cisco Optical Networking System (ONS) nodes or nodes that are unknown.
	For a Cisco Data for Telecommunications (CDT) node, this option launches the CDT login web page.
Node > Launch CTC (ONS nodes only)	Launches the Cisco Transport Controller (CTC) for managing ONS nodes. For more information about using the CTC, refer to the *CTC Launcher Application Guide* (http://www.cisco.com/en/US/products/hw/optical/ps2006 /prod_configuration_guide09186a008051ea52.html).
	This option appears only for ONS nodes.
Node > Connect To	Links to the node.
	This option is dimmed if the chosen node has no IP addresses.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Operator (level 3) and higher.
Poll Node > Normal Poll	Polls all chosen nodes or ITP signaling points, retaining all currently known objects.
	Normal Poll retains all objects associated with polled nodes or signaling points, even objects that have been deleted and are, therefore, in Unknown status.
	This option is dimmed if the chosen node has no IP addresses.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Operator (level 3) and higher.
Poll Node > Clean Poll	Polls all chosen nodes or ITP signaling points and removes any Unknown network objects after the completion of the poll.
	Clean Poll removes all network objects from the node or signaling point at the completion of the poll.
	This option is dimmed if the chosen node has no IP addresses.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Operator (level 3) and higher.

Menu Command	Description
Allow Trap Processing	Enables the MWTM to process traps from the chosen node. This is the default setting.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 4) and higher.
Disallow Trap Processing	Prevents the MWTM from processing traps from the chosen node.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 4) and higher.
Unmanage	Labels the chosen node or signaling point Unmanaged.
	Note If you change a node to the Unmanaged status, the MWTM removes adjacent legacy nodes from the topology map.
	You cannot label a node or signaling point Unmanaged if it has a Node Type of Unknown. If you select a node or signaling point with a Node Type of Unknown, then this menu option is dimmed and cannot be chosen.
	This option is dimmed if the chosen node has no IP addresses.
	Events for unmanaged objects will continue to appear in the Events window. To suppress events for unmanaged objects, set this option using an event filter (Setting an Alarm or Event Filter, page 9-18).
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Administrator (level 4) and higher.
Manage	Removes the Unmanaged status from the chosen node or signaling point.
	Note If you change a node to the Managed status, the MWTM adds adjacent legacy nodes back to the topology map.
	You cannot remove the Unmanaged status from a node with a Node Type of Unknown. If you select a node with a Node Type of Unknown, then this menu option is dimmed.
	This option is dimmed if the chosen node has no IP addresses.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Administrator (level 4) and higher.

Menu Command	Description
Exclude from View	Excludes the chosen node or signaling point from the current view. See Creating a New View, page 7-8 for more information about excluding objects. The MWTM removes excluded objects and their associated objects from the topology map (see Excluded Objects Tab, page 10-10).
Deploy *Object* > From Archive (ITP only)	Launches the Deployment Wizard for the chosen node or ITP signaling point. See Deploying a File Associated with an ITP Node or Signaling Point, page 8-9 for more information about deploying to nodes or ITP signaling points.
Deploy *Object* > From File (ITP only)	Launches the Deployment Wizard for the chosen node or ITP signaling point. See Deploying a File Associated with an ITP Node or Signaling Point, page 8-9 for more information about deploying to nodes or ITP signaling points.

Deploying a File Associated with an ITP Node or Signaling Point

You use the MWTM to deploy a GTT file or route table file associated with an ITP node or signaling point. To do so, right-click the ITP node or signaling point in a window, then choose **Deploy** *Object* **> From Archive** or **From File** in the right-click menu. The MWTM launches the Deployment Wizard for the chosen ITP node or signaling point. See Deploying a Route Table File, page 13-13 and Deploying a GTT File, page 14-37 for more information.

Viewing Management Interfaces and Physical Folders

ITP, IPRAN, and mSEF nodes can contain:

- **Management Interfaces**—A folder that contains a list of interfaces that the MWTM uses to manage the node.

- **Physical**—A folder that contains a list of the physical interfaces and ONS cards that belong to the node. Slot numbers precede ONS card objects (for example, *15 - RAN_SVC* or *02 - E1-42*).

Figure 8-2   Management Interfaces and Physical Folders
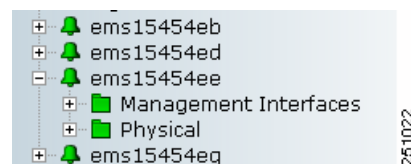
All objects in the Physical folder are ignored *unless* they also appear outside of the Physical folder. The status of Physical folder-only objects do not contribute to the status of the parent node. These objects also do not appear in the Active Alarms list, but they do appear in the Event History. You can un-ignore the Physical folder, then re-ignore the objects you do not want to monitor. For more information, see Why are objects in the Physical folder ignored?, page C-8).

Viewing Status Contributors

The Status Contributors section displays information about conditions that contribute to the overall status of the chosen object. To view the Status Contributors section, select an object in the navigation tree and click the Status Contributors tab in the right pane.

The content pane lists all objects contributing to the status of the object you have chosen in the navigation tree. A tooltip in the content pane lists the fully qualified domain name (FQDN) for the object.

To see which object types pertain to the Status Contributors tab, see Appendix A, "Client Object Map Reference." If the object does not have any associated objects, the Status Contributors tab will not appear.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns except Internal ID.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Status Contributors table contains:

Column	Description
Internal ID	Internal ID of the object. The internal ID is a unique ID for every object, assigned by the MWTM for its own internal use. It can also be useful when the TAC is debugging problems.
Name	Name of the object.
Object Type	Type of network object.
Ignored	Indicates whether the object should be included when aggregating and displaying MWTM status information: • Uncheck the check box to include the object. This is the default setting. • Check the check box to exclude the object. This field can be edited by users with authentication level Power User (level 2) and higher.
Notes	Indicates whether a note is associated with the object.
Events	Indicates whether the object has an associated recent event. (Even if the server purges all of the events associated with the object, the MWTM continues to display the event icon in this field.) To: • Delete the event icon (orange triangle) from MWTM displays for a specific object, select the object and click the icon. • Delete the event icon from MWTM displays for all objects, choose **Edit > Clear All Events** from the MWTM main menu. **Note** During Discovery, the MWTM might flag objects with an event icon. If the event icons are too distracting, use the **Edit > Clear All Events** menu option to remove them.
Last Status Change	Date and time that the status of the object last changed.
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."

Column	Description
Status	Current status of the object. Possible values are: 🟢 Active 🔴 Blocked 🔵 Discovering 🔴 Down 🔴 Failed 🔴 Inactive 🔵 Inhibited 🔵 InhibitLoc 🔵 InhibitRem ⚫ None ⚪ Not Present

Column	Description
Status (continued)	Old Unmanaged
	Pending
	Polling
	Shutdown
	Unavailable
	Unknown
	Unmanaged
	Waiting
	Warning
	For detailed definitions of each status, see Status Definitions for Signaling Gateway Mated Pairs, page E-7.
Status Reason	Reason for the current status of the object.
	For a full list of possible reasons, see the *stateReasons.html* file. If:
	• You installed the MWTM in the default directory, */opt*, then the file is located at */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory.
	• You installed the MWTM in a different directory, then the help directory and file are in that directory.
	If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip.
	The MWTM lists status reasons in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears.
	If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

Viewing Details

The Details section displays information such as naming and status details for the chosen object.

To view the Details section, select a view in the navigation tree, select an object, then click the Details tab in the right pane.

Note   If the chosen object is a link, linkset, signaling gateway-mated pair, RAN-O backhaul or shorthaul, the Details tab displays both peers of the chosen object in adjacent panes for easy comparison.

The Details tab contains these sections (in alphabetical order):

Section	Applicable Object(s)	Applicable Network Type(s)
Address Information	Interfaces	All networks
Advanced Details (Web)	Nodes	BWG, CSG2, HA, and GGSNs on card
Association Information	Application Servers	ITP only
Bandwidth Information	Backhauls	RAN-O only
Capability Point Code	Signaling Points	ITP only
Description	Linksets, Signaling Points	
Descriptive Information	Cards, Nodes	All networks
General Information	Application Servers, Application Server Process Associations, Interfaces, Linksets, Shorthauls	
Interface Information	Links, Signaling Gateway Mated Pairs	ITP only
IP Addresses for SNMP or IP Addresses Not for SNMP	Nodes	All networks
Links Information	Linksets	ITP only
Local IP Address Information	Application Server Processes, Application Server Process Associations, Links, Signaling Gateway Mated Pairs	
Naming Information	All objects	All networks
Point Code	Signaling Points	ITP only
Polling Information	Nodes	All networks
Protection Information	Cards, ONS Nodes	RAN-O only
QoS Information	Signaling Points	ITP only
RAN Information	Interfaces, Shorthauls	RAN-O only
Remote IP Address Information	Application Server Process Associations, Links, Signaling Gateway Mated Pairs	ITP only
Status Information	All objects	All networks
Threshold Information (RAN-O Only)	Backhauls, Nodes	RAN-O only
Uptime Information	Nodes	All networks

Tip   If the pair of a link, linkset, or signaling gateway-mated pair is Unknown, and if the peer of a backhaul or shorthaul is Unknown, `Unknown` appears for the pair or peer fields in the Details tab.

Address Information

The Address Information section for interfaces contains:

Field	Description
IP Address	List of IP addresses that are assigned to the interface.

Advanced Details (Web)

The Advanced Details (Web) link appears in the MWTM client and launches the MWTM web interface to display the Statistics tab for the selected node. The Advanced Details (Web) link enables you to access advanced statistics that are available only for these nodes:

- CSG2 (see Displaying CSG2 Real-Time Statistics, page 11-44)

- BWG (see Displaying BWG Real-Time Statistics, page 11-49)

- HA (see Displaying HA Real-Time Statistics, page 11-62)

- GGSN on a SAMI card (see Displaying GGSN Real-Time Statistics, page 11-65)

Association Information

The Association Information section for ITP application servers contains:

Field	Description
Number of ASPAs	Number of application server process associations that are associated with this application server.
Number of Active ASPAs	Number of active application server process associations that are associated with this application server.

Bandwidth Information

The Bandwidth Information section for RAN-O backhauls (and virtual backhauls) contains:

Field	Description
User Send Bandwidth (bits/sec) User Receive Bandwidth (bits/sec)	Bandwidth that the user specifies for the backhaul. Send and receive bandwidth values will be different if the interface is asymmetrical. By default, the user bandwidth is the same as the system bandwidth. **Note** When you change the User Bandwidth (see Editing Properties for a RAN-O Backhaul, page 6-36), you are changing the scale of the Y axis of the backhaul real-time chart in the Performance tab (see Viewing Backhaul Performance Data, page 8-111). The X and Y values of the data do not change. The threshold ranges resize because they are percentages of User Bandwidth.
System Send Bandwidth (bits/sec) System Receive Bandwidth (bits/sec)	Bandwidth that the system specifies (as defined on the node) for the backhaul. Send and receive bandwidth values will be different if the interface is asymmetrical. You cannot edit this field.

Capability Point Code

The Capability Point Code section for ITP signaling points contains:

Column	Description
Point Code	Capability point code of the signaling point.
Variant	SS7 protocol variant. Valid variants are: • ANSI • China • ITU • NTT • TTC

Column	Description
Network Indicator	Determines the type of call. Valid values are: • **National**—National-bound call. The MWTM routes national calls through the national network. • **NationalSpare**—National-bound call, used in countries in which more than one carrier can share a point code. In those countries, the **Network Indicator** differentiates networks. • **International**—International-bound call. The MWTM forwards international-bound calls to an STP pair that acts as an international gateway. • **InternationalSpare**—International-bound call, used in countries in which more than one carrier can share a point code. In those countries, the **Network Indicator** differentiates networks.
Network Name	Name of the network associated with the signaling point.

Description

The Description section contains a description of the ITP signaling point or linkset. If the signaling point or linkset has no description, this section is blank. If the linkset is unknown, `Unknown` appears in the Description section.

Descriptive Information

The Descriptive Information section for nodes and ONS cards contains:

Field	Description
Software Description	Comprehensive information about the software that is installed on the node.
Software Version	Version of software (for example, the ONS package or IOS version) that is installed on the node.
Description	Full description of the ONS card (for example, RAN_SVC_LINE_CARD).
Hardware Version	Version of the hardware of the ONS card (for example, VID=000, HwRev=29).
Firmware Version	Version of the firmware on the ONS card, if applicable (for example, 12.2(24)St).

General Information

The General Information section applies to these objects:

Interfaces

The General Information section for interfaces contains:

Field	Description
Maximum Packet Size	Maximum packet size on the interface in bytes.
Send Speed (bits/sec)	Interface send speed in bits per second.
Receive Speed (bits/sec)	Interface receive speed in bits per second.

ITP Application Servers

The General Information section for ITP application servers contains:

Field	Description
Protocol	Protocol associated with the application server. Possible values are: • **M3UA**—MTP3-User Adaptation. • **SUA**—SCCP-User Adaptation.
QoS	Quality of service (QoS) class of the application server.
Routing Key	Routing key associated with the application server. The routing key is the value that determines the routing decisions that the application server makes.
Traffic Mode	Method by which the application server forwards requests to its active application server processes. Possible values are: • **overRide**—One application server process takes over all traffic for the application server, possibly overriding any currently active application server process in the application server. • **broadcast**—Every active application server process receives the same message. • **loadBind**—Each application server process shares in the traffic distribution with every other currently active application server process, based on application server process bindings. • **loadRndRobin**—Each application server process shares in the traffic distribution with every other currently active application server process, using a round-robin algorithm. • **undefined**—The traffic mode is not defined. The first application server process that becomes active defines the traffic mode.

ITP Linksets

The General Information section for ITP linksets contains:

Field	Description
Linkset Type	Type of linkset, which the MWTM determines by examining the links defined in the linkset. Possible linkset types are: • **HSL**—The links in this linkset use the SS7-over-ATM (Asynchronous Transfer Mode) high-speed protocol. • **SCTPIP**—The links in this linkset use the Stream Control Transmission Protocol (SCTP) IP transport protocol. • **Serial**—The links in this linkset use the serial SS7 signaling protocol. • **Mixed**—The links in this linkset are of two or more types. (This configuration is not recommended.) • **Virtual**—The links in this linkset are virtual links, which connect signaling point instances running on the same node. The MWTM does not poll virtual linksets, nor does it display real-time data or accounting statistics for virtual linksets. **Note** Prior to IOS release 12.2(23)SW1, the user manually created virtual linksets on multi-instance nodes. In and after that release, the system automatically creates virtual linksets. • **Other**—No links have been defined for this linkset.
Inbound ACL	Inbound IP access control list (ACL) number for the linkset. If no inbound ACL exists for the linkset, this field displays **0**. If the linkset is a Virtual linkset, this field displays N/A.
Outbound ACL	Outbound ACL number for the linkset. If no outbound ACL exists for the linkset, this field displays **0**. If the linkset is a Virtual linkset, this field displays N/A.

Interface Information

The Interface Information section for ITP links and application server process associations contains:

Field	Description
Interface Name	(HSL, Serial, and Virtual links only) Name of the interface.
Interface Index	(HSL, Serial, and Virtual links only) Index into the SNMP interface table.
QoS	(SCTP links only) Quality of service (QoS) class of the link.
Configured Local Port	(SCTP links only) Local port for which the link was configured.
Local Port	(SCTP links only) If the link is active, local port that the link is currently using. If the link is not active, **0** appears.

Field	Description
Configured Remote Port	(SCTP links only) Remote port for which the link was configured.
Actual Remote Port	(SCTP links only) If the link is active, remote port that the link is currently using. If the link is not active, **0** appears.
Protocol	Protocol associated with the application server process association. Possible values are: • **M3UA**—MTP3-User Adaptation. • **SUA**—SCCP-User Adaptation.

IP Addresses for SNMP

The IP Addresses for SNMP section for nodes contains:

Field	Description
IP Address	IP addresses associated with this node, including the primary SNMP address and all backup IP addresses, that are intended for SNMP.
Last Regular Poll Time	Date and time of the last full poll of the node. If the IP address has never been polled, the MWTM displays the description `Never Polled`.
SNMP Pollable	Whether or not the IP address is used for SNMP polling.

If there are no IP addresses defined for the node that are intended for SNMP, this field displays the description:

`There are no other IP addresses defined for this node.`

IP Addresses Not for SNMP

The IP Addresses Not for SNMP section for nodes contains:

Field	Description
IP Address	IP addresses associated with this node that are *not* intended for SNMP.

If no IP addresses are defined for the node that are not intended for SNMP, this field displays the description:

`There are no other IP addresses defined for this node.`

Links Information

The Links Information section for ITP linksets contains:

Field	Description
Links	Total number of links in the linkset.
Active Links	Number of links in the linkset that are Active.
Congested Links	Number of links in the linkset that are Congested.

Local IP Address Information

The Local IP Address Information section for ITP application server processes, application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description

IP Address	Local IP address that the object is using, or the primary IP address that is configured for the object, or both.
	
	The primary IP address is the first CS7 local IP address you configure in the node. For example, if you configure these IP addresses in the node:
	
	`cs7 local-peer 4180`
	`  local-ip 128.3.0.77`
	`  local-ip 128.3.0.254`
	
	then the MWTM uses `128.3.0.77` as the primary IP address. If someone deletes this IP address from the node configuration, or adds a new IP address to the beginning of the list, the MWTM detects the change and automatically updates this field to reflect the new primary IP address.

Interface Name	Name of the interface to which the IP address is assigned. If the object has no interface name, this field is blank.
Status	Current status of the IP address. Possible values are: **Active**—The IP address is currently fully functional. **Inactive**—The IP address is not currently functional.
Cfg	Indicates whether this local IP address was configured for the object. Possible values are: • **Yes**—This is the configured local IP address, and the object is currently using it. • **(blank)**—This is not the configured local IP address.
Actual	Indicates whether this local IP address is currently being used by the object. Possible values are: • **Yes**—The object is currently using this IP address. • **(blank)**—The object is not using this IP address.

Naming Information

The Naming Information section applies to these objects:

Nodes

The Naming Information section for nodes contains:

Field	Description
Display Name	Name of the node.
IP Address or DNS Hostname	IP address or DNS name of the node, as the MWTM discovered it. However, if you modified your preferences to identify nodes by their IP addresses, then this is method of node identification in this field. For more information, see Node Name Settings, page 5-5.
Node Type	Type of node. See Nodes Table, page 6-5, for a list of the available node types.
Feature	Primary function performed by the node type. See Nodes Table, page 6-5, for a list of the available features.
Chassis Type (ONS only)	Description of the chassis hardware type (for example, ONS 15454 SDH ETSI). **Note** This field appears only for the ONS chassis.
Serial Number	Serial number of the node.
CLLI Code (ITP only)	COMMON LANGUAGE Location Identification Code for the node. A CLLI code is a standardized 11-character identifier that uniquely identifies the geographic location of the node. If the node has no CLLI code configured, this field is blank.
SNMP Access (RAN-O only)	Indicates the type of SNMP access: - **In-band**—Access is through the backhaul interface (cell site). - **Out of band**—Access is external to the backhaul interface (aggregation site). - **Undefined**—Access is not defined.
Location (RAN-O only)	The location of the SNMP settings, whether at the cell site (BSC) or the aggregation node site (BTS). [1]

Cards

The Naming Information section for ONS cards contains:

Field	Description
Name	Name of the card.
Card Type[1]	Type of card. Card types for ONS include: • **TCC**—Control • **E1**—Ethernet • **STM1**—Synchronous Transport Module • **DS1**—Digital Signal • **OC3**—Optical • **XC**—Cross-connect
Card Type (continued)	• **RAN_SVC**—RAN Service • **ALM_PWR**—Alarm and Power • **CRFT_TMG**—Craft Terminal • **AICI**—Alarm Interface Controller
Model Name	Model name of the card (for example, PartNum=800-26651-01).
Slot Number	Slot number of the card in the ONS chassis.
Serial Number	Serial number of the card.

1. See the *Cisco ONS 15454 Product Overview* for information about ONS cards:
   http://www.cisco.com/univercd/cc/td/doc/product/ong/15400/45431po.htm

Interfaces

The Naming Information section for interfaces (which includes RAN backhaul and shorthaul interfaces) contains:

Field	Description
Name	Name of the interface.
Node	Name of the node to which the interface belongs.
Physical Address	Physical address of the interface.
Interface Index	Interface index number.
Interface Type	Interface type.
RAN Connection To	RAN connection that is associated with the interface. **Note** Not visible for RAN backhauls.
Virtual RAN Backhaul	Whether the RAN backhaul is a virtual backhaul. For more information about virtual RAN backhauls, see Creating Virtual RAN Backhauls, page 8-140. **Note** Visible only for RAN backhauls.

ITP Application Servers

The Naming Information section for ITP application servers contains:

Field	Description
Name	Name of the application server.
Node	Name of the node associated with the application server.
Signaling Point	Name of the signaling point associated with the application server.

ITP Application Server Processes

The Naming Information section for ITP application server processes contains:

Field	Description
Name	Name of the application server process.
Node	Name of the node associated with the application server process.
Local Port	Local port number that the application server process is currently using.

ITP Application Server Process Associations

The Naming Information section for ITP application server process associations contains:

Field	Description
Name	Name of the application server process association.
Node	Name of the node associated with the application server process association.
Signaling Point	Name of the signaling point associated with the application server process association.
Application Server	Name of the application server associated with the application server process association.
Application Server Process	Name of the application server process associated with the application server process association.

ITP Links

The Naming Information section for ITP links contains:

Field	Description
Node	Name of the node associated with the link.
Signaling Point	Name of the signaling point associated with the link.
Linkset	Name of the linkset associated with the link.

Field	Description
SLC	Signaling link code (SLC) ID for the link.
Type	Type of link. Possible link types are: • **HSL**—The link uses the SS7-over-ATM (Asynchronous Transfer Mode) high-speed protocol. • **SCTPIP**—The link uses the Stream Control Transmission Protocol (SCTP) IP transport protocol. • **Serial**—The link uses the serial SS7 signaling protocol. • **Virtual**—The link is a virtual link, which connects signaling point instances running on the same node. The MWTM does not poll virtual links, nor does it display real-time data or accounting statistics for virtual links.

ITP Linksets

The Naming Information section for ITP linksets contains:

Field	Description
Name	Name of the linkset.
Node	Node associated with the linkset.
Signaling Point	Signaling point associated with the linkset.
Local Point Code	Point code of the primary signaling point for the linkset.
Adj Point Code	Point code of the adjacent signaling point for the linkset.

ITP Signaling Gateway-Mated Pairs

The Naming Information section for ITP signaling gateway-mated pairs contains:

Field	Description
Name	Name of the signaling gateway-mated pair.
Node	Name of the node associated with the signaling gateway-mated pair.
Is Passive	Indicates whether the signaling gateway-mated pair can initiate the connection to the mate: • **Yes**—The signaling gateway-mated pair is passive, and cannot initiate the connection to the mate. • **No**—The signaling gateway-mated pair is not passive, and can initiate the connection to the mate.

ITP Signaling Points

The Naming Information section for ITP signaling points contains:

Column	Description
Name	Name of the signaling point.
Node	Name of the node associated with the signaling point.
Network Name	Name of the network associated with the signaling point.
Instance Number	Number of the instance associated with the signaling point.

Point Code

The Point Code section for ITP signaling points contains:

Column	Description
Point Code	Primary and secondary point codes of the signaling point.
Variant	SS7 protocol variant. Valid variants are: • ANSI • China • ITU • NTT • TTC
Network Indicator	Determines the type of call. Valid values are: • **National**—National-bound call. The MWTM routes national calls through the national network. • **NationalSpare**—National-bound call, used in countries in which more than one carrier can share a point code. In those countries, the Network Indicator differentiates networks. • **International**—International-bound call. The MWTM forwards international-bound calls to an STP pair that acts as an international gateway. • **InternationalSpare**—International-bound call, used in countries in which more than one carrier can share a point code. In those countries, the Network Indicator differentiates networks
Network Name	Name of the network associated with the signaling point.

Polling Information

The Polling Information section for nodes contains:

Field	Description
Process Traps	Indicates whether traps are processed. To change this setting, check or uncheck the check box in the Process Traps column of the Nodes table.
Trap Polling	Indicates whether trap polling is enabled or not. For IPRAN or mSEF nodes, if you want to: • Enable trap polling, set ipran-mib snmp-access to outOfBand on the node. • Disable trap polling, set ipran-mib snmp-access to inBand on the node. **Note** For information about in-band and out-of-band management, see RAN-O Specific FAQs, page C-17.
Report Polling	Indicates whether report polling is enabled or not. For IPRAN or mSEF nodes, if you want to: • Enable trap polling, set ipran-mib snmp-access to outOfBand on the node. • Disable trap polling, set ipran-mib snmp-access to inBand on the node. **Note** For information about in-band and out-of-band management, see RAN-O Specific FAQs, page C-17.
First Discovered	Date and time that the MWTM first discovered the node.
Last Poll IP Address	Last IP address that was polled for this node. For an unmanaged node, this field is blank.
Last Full Poll Time	Date and time of the last full poll of the node for node-related MIBs (as opposed to a demand poll for just one associated object's data). For a node that is not an ITP, IPRAN, or mSEF node, this field is blank.
Last MWTM Poll Response (secs)	Time, in seconds, taken by this node to respond to the last MWTM poll request. For a node that is not an ITP, IPRAN, or mSEF node, this field is blank.
Avg. MWTM Poll Response (secs)	Average time, in seconds, taken by this node to respond to MWTM poll requests. For a node that is not an ITP, IPRAN, or mSEF node, this field is blank.

Protection Information

The Protection Information section for ONS nodes and cards contains:

Column	Description
Card Type	The type of card.
	This column appears only when you select the ONS node in the navigation tree.
Protected Slot	Slot number of the protected card, which is configured for protection.[1]
Protecting Slot	Slot number of the card that is protecting one or more cards.
Configured State	The configured state of the chosen card: Working or Protecting. The card is working normally or protecting another card.
Current State	The current state of the chosen card: Active or Standby.

1. See the *Cisco ONS 15454 Product Overview* for information about protection schemes for ONS cards:
   http://www.cisco.com/univercd/cc/td/doc/product/ong/15400/45431po.htm

QoS Information

The QoS Information section for ITP signaling points contains:

Column	Description
QoS	Quality of service (QoS) class of the signaling point. Valid QoS classes range from **1** through **7**. ALL indicates that the signaling point accepts all QoS classes.
ToS	Type of service (ToS) of the signaling point.
DSCP	IP differentiated-services-code-point (DSCP) of the signaling point.

RAN Information

> **Note**   This subsection appears only for configured RAN interfaces (GSM Abis and UMTS Iub interfaces).

The RAN Information section contains:

Field	Description
Protocol	Protocol of the interface (GSM-Abis or UMTS-Iub).
Local IP Address	IP address of the local node.
Local Port	Local port that the interface uses.
Remote IP Address	IP address of the remote (peer) node.
Remote Port	Remote port that the interface uses.

Remote IP Address Information

The Remote IP Address Information section for ITP application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description
IP Address	Remote IP address associated with the object.
Type	Indicates whether this designated primary IP address is for the object (Primary), or is the IP address currently being used by the object (Effective), or both (Primary and Effective). Usually, the same IP address is Primary and Effective. However, if the primary IP address is down for some reason, the object uses a different IP address and is labeled Effective.
Status	Current status of the IP address. Possible values are: **Active**—The IP address is currently fully functional. **Inactive**—The IP address is not currently functional.
Cfg	(12.2(4)MB10 and later) Indicates whether this remote IP address was configured for the object. Possible values are: • **Yes**—This is the configured remote IP address, and the object is currently using it. • **(blank)**—This is not the configured remote IP address. • **N/A**—The MWTM cannot determine whether this is the configured remote IP address. For Cisco IOS software releases prior to 12.2(4)MB10, this field always displays N/A.
Actual	Indicates whether the object is currently using this remote IP address. Possible values are: • **Yes**—The object is using the IP address. • **(blank)**—The object is not using the IP address.

Uptime Information

The Uptime Information section for nodes contains:

| Field	Description
Uptime	Time the node is up, in days, hours, minutes, and seconds.
Reboot Reason	Reason for the last reboot of the node.

Status Information

The Status Information section applies to these objects:

- Nodes, page 8-29
- Interfaces and Cards, page 8-30 (includes RAN backhauls and shorthauls)

- ITP Application Servers, page 8-34

- ITP Application Server Processes, page 8-35

- ITP Application Server Process Associations, page 8-36

- ITP Links, page 8-38

- ITP Linksets, page 8-39

- ITP Signaling Gateway Mated Pairs, page 8-40

- ITP Signaling Points, page 8-42

Nodes

The Status Information section for nodes contains:

Field	Description
Is Ignored	Indicates whether the node is Ignored (that is, whether to include the node when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
MTP3 Offload (ITP only)	Indicates whether MTP3 offload is configured for the node. Possible values are: • **Main**—The MTP3 management function operates only on the main processor. • **Offload**—The MTP3 management function operates on the main processor and on other available processors. • **N/A**—MTP3 offload cannot be determined.
NSO Status (ITP only)	Current NSO status of the node, with a color-coded background. Possible values are: **Local**—NSO is configured and the secondary peer is in the appropriate status for failover support. **Local**—NSO is configured, but the secondary peer is *not* in the appropriate status for failover support. **None**—The node and MIB support NSO, but NSO is not configured on the ITP. **N/A**—The node and MIB do not support NSO, or the MWTM cannot determine the NSO status.

Field	Description
Status	Current status of the node. Possible values are: Active Discovering Polling Unknown Unmanaged Waiting Warning For detailed definitions of each status, see Status Definitions for Signaling Gateway Mated Pairs, page E-7.
Last Status Change	Date and time that the status of the node last changed.
Status Reason	Reason for the current status of the signaling gateway-mated pair. For a full list of possible reasons, see the *stateReasons.html* file. If: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

Interfaces and Cards

The Status Information section for interfaces (including RAN backhaul and shorthaul interfaces) and cards contains:

Field	Description
Is Ignored	Indicates whether the interface or card is Ignored (that is, whether the interface or card should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."

Field	Description
Admin Status	Displays the administrative status of the interface. Status can be: Unknown—Unknown administrative status. Up—Administratively up. Shutdown—Administratively down. Testing—Administrator is testing the interface.
Operational Status	Displays the operational status of the interface. Status can be: Unknown—Unknown operational status. Up—Interface is up. Down—Interface is down. Testing—Interface is in test mode. Dormant—Interface is dormant. Not Present—An interface component is missing. Lower Layer Down—An interface is down because of a lower-layer interface.
Connect State (for GSM Abis)	Displays the connection state of a GSM interface. States can be: Connected—The node is monitoring local and remote alarm status. Disconnected—The system ignores the local alarm status. The local transmitter on the shorthaul is disabled. Capability messages are transmitted to the remote describing the provisioning. The system stays disconnected until the remote capabilities are known and the peer state is transitioning to connected. Send Connect—One or more attempts have been made to connect to remote peer. Receive Connect—The local-peer has received a connect request from the remote-peer. Connect Rejected—Connection was rejected. ACK Connect—The initial connect request was sent and acknowledged by remote-peer. The local-peer is now waiting for a connect request from the remote-peer. Check Connect—The local peer has reason to believe its remote peer has failed. Additional tests are being processed to verify peer's state.

Field	Description
Connect State (for UMTS Iub)	Displays the connection state of a UMTS interface. States can be: Initialized—The connection is starting initialization. Starting—The shorthaul interface is administratively active, but the backhaul interface is down. Closed—The backhaul interface is active, but the shorthaul is administratively closed. Stopped—Unable to connect to peer in specified time interval. Additional attempts will be tried based on peer request or restart timers. Closing—Connection closed by administration request. Stopping—Connection shut down by peer's Term-Request. Will transition to stopped state. Connect Sent—Connection request sent to peer. ACK Received—Connection request sent and acknowledgement is received from peer. Now waiting for peer's connection request. ACK Sent—Connection request received and acknowledgement is sent to peer. Connection request sent and waiting for peer's acknowledgement. Open—Connection open and available for traffic.
Local Receive Alarm State Local Transmit Alarm State Remote Receive Alarm State Remote Transmit Alarm State (for UMTS Iub)	Displays alarm states for UMTS Iub interface. States can be: Remote Alarm—Indicates a problem at the remote end. The remote interface in the E1/T1 data stream generates and sends the alarm, and no other action is required. No Alarm—No alarm is present. Local Alarm—Indicates local interface problem. The interface has not received synchronization from the GSM node. The node stops transmitting backhaul samples. Received Alarm—Indicates receive problem in the local node. The remote node stops transmitting backhaul data and indicates a blue alarm. Alarm State Unavailable—Indicates the alarm state is not available. This state only applies to the remote and occurs when the peer connection is inactive.

Field	Description
Local State Remote State (for GSM Abis)	Displays alarm states for GSM Abis interface. States can be: Remote Alarm—Indicates a problem at the remote end. The remote interface in the E1/T1 data stream is generates and sends the alarm, and no other action is required. No Alarm—No alarm is present. Local Alarm—Indicates local interface problem. The interface has not received synchronization from the GSM node. The node stops transmitting backhaul samples. Received Alarm—Indicates receive problem in the local node. The remote node stops transmitting backhaul data and indicates a blue alarm. Alarm State Unavailable—Indicates the alarm state is not available. This state only applies to the remote and occurs when the peer connection is inactive.
Redundancy State	Displays information about the GSM Abis or UMTS Iub interface redundancy state. States can be: **Active**—Active owner of interface. **Standby**—Active owner of interface.
Status	Current status of the interface or card. Possible values are: Active Discovering Down Polling Unknown Unmanaged Waiting Warning For detailed definitions of each status, see Status Definitions for Signaling Gateway Mated Pairs, page E-7.

| Field	Description
Last Status Change	Date and time of last change to status.
Status Reason	Reason for the current status of the interface or card.
	For a full list of possible reasons, see the *stateReasons.html* file. If:
	• You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory.
	• You installed the MWTM in a different directory, then the help directory and file are in that directory.
	If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip.
	The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears.
	If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

ITP Application Servers

The Status Information section for ITP application servers contains:

Field	Description
Is Ignored	Indicates whether the application server is Ignored (that is, whether the application server should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
Mate Status	Current status of the application server on the signaling gateway mate. Possible values are:
	Active
	Down
	Inactive
	Pending
	Shutdown
	Unknown
	Warning
	For detailed definitions of each status, see Status Definitions for Application Servers, page E-4.

Field	Description
Last Status Change	Date and time that the status of the application server last changed.
Status	Current status of the application server. Possible values are: 🟢 Active 🔴 Down 🔴 Inactive 🔴 Pending 🔵 Shutdown 🔴 Unknown 🟡 Warning For detailed definitions of each status, see Status Definitions for Application Servers, page E-4.
Status Reason	Reason for the current status of the signaling gateway-mated pair. For a full list of possible reasons, see the *stateReasons.html* file.To: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

ITP Application Server Processes

The Status Information section for ITP application server processes contains:

Field	Description
Is Ignored	Indicates whether the application server process is Ignored (that is, whether to include the application server process when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."

Field	Description
Last Status Change	Date and time that the status of the application server process last changed.
Status	Current status of the application server process. Possible values are: 🔴 Unknown ⬛ Unmanaged For detailed definitions of each status, see Status Definitions for Application Server Processes, page E-4.
Status Reason	Reason for the current status of the signaling gateway-mated pair. For a full list of possible reasons, see the *stateReasons.html* file. To: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

ITP Application Server Process Associations

The Status Information section for ITP application server process associations contains:

Field	Description
Is Ignored	Indicates whether the application server process association is Ignored (that is, whether the application server process association should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
Congestion Level	Indicates the level of congestion on the application server process association. An application server process association is congested if it has too many packets waiting to be sent. This condition could be caused by the failure of an element in your network. Possible values for the Congestion Level field are None, indicating no congestion, and **1** to **7**, indicating levels of congestion from very light (**1**) to very heavy (**7**).

Field	Description
Instance Status	Current status of the protocol associated with the application server process, with a color-coded background. Possible values are: ● Active—The protocol is available. ● Shutdown—An administrator has forced the protocol to an unavailable state. ● Unknown—The MWTM cannot determine the current status of the protocol.
Status	Current status of the application server process association. Possible values are: ● Active ● Blocked ● Down ● Inactive ● Pending ● Shutdown ● Unknown ● Warning For detailed definitions of each status, see Status Definitions for Application Server Process Associations, page E-4.
Last Status Change	Date and time that the status of the application server process association last changed.
Status Reason	Reason for the current status of the signaling gateway-mated pair. For a full list of possible reasons, see the *stateReasons.html* file. To: • You installed the MWTM in the default directory, */opt*, then the file is located at */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are located in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

ITP Links

The Status Information section for ITP links contains:

Field	Description
Is Ignored	Indicates whether the link is Ignored (that is, whether the link should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
Last Status Change	Date and time that the status of the link last changed.
Status	Current status of the link. Possible values are: Active Blocked Failed InhibitLoc InhibitRem Shutdown Unknown Warning For detailed definitions of each status, see Status Definitions for Links, page E-6.
Status Reason	Reason for the current status of the link. For a full list of possible reasons, see the *stateReasons.html* file. To: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

Field	Description
Congestion Level	Indicates the level of congestion on the link. A link is congested if it has too many packets waiting to be sent. This condition could be caused by the failure of an element in your network. Possible values for the Congestion Level field are None, indicating no congestion, and **1** to **7**, indicating levels of congestion from very light (**1**) to very heavy (**7**).
Receive Utilization	Indicates whether, on average, the link is under its configured receive utilization threshold (UnderThreshold) or over the threshold (OverThreshold).
Send Utilization	Indicates whether, on average, the link is under its configured send utilization threshold (UnderThreshold) or over the threshold (OverThreshold).

ITP Linksets

The Status Information section for ITP linksets contains:

Field	Description
Is Ignored	Indicates whether the linkset is ignored (that is, whether the linkset should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
Last Status Change	Date and time that the status of the linkset last changed.

Field	Description
Status	Current status of the linkset. Possible values are: 🟢 Active 🔵 Shutdown 🔴 Unavailable 🔴 Unknown 🟡 Warning For detailed definitions of each status, see Status Definitions for Linksets, page E-7.
Status Reason	Reason for the current status of the signaling gateway-mated pair. For a full list of possible reasons, see the *stateReasons.html* file. To: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons appear(s) in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

ITP Signaling Gateway Mated Pairs

The Status Information section for ITP signaling gateway mated pairs contains:

Field	Description
Is Ignored	Indicates whether the signaling gateway-mated pair is Ignored (that is, whether the signaling gateway-mated pair should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
Congestion Level	Indicates the level of congestion on the signaling gateway-mated pair. A signaling gateway-mated pair is congested if it has too many packets waiting to be sent. This condition could be caused by the failure of an element in your network. Possible values for the Congestion Level field are None, indicating no congestion, and **1** to **7**, indicating levels of congestion from very light (**1**) to very heavy (**7**).

Field	Description
Instance Status	Current status of the protocol associated with the signaling gateway-mated pair, with a color-coded background. Possible values are: Active—The protocol is available. Shutdown—An administrator has forced the protocol to an unavailable state. Unknown—The MWTM cannot determine the current status of the protocol.
Status	Current status of the signaling gateway-mated pair. Possible values are: Active Blocked Down Inactive Pending Shutdown Unknown Warning For detailed definitions of each status, see Status Definitions for Application Server Process Associations, page E-4.
Last Status Change	Date and time that the status of the signaling gateway-mated pair last changed.
Status Reason	Reason for the current status of the signaling gateway-mated pair. For a full list of possible reasons, see the *stateReasons.html* file. To: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears. If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

ITP Signaling Points

The Status Information section for ITP signaling points contains:

Column	Description
Is Ignored	Indicates whether the signaling point is Ignored (that is, whether the signaling point should be included when aggregating and displaying MWTM status information).
Alarm Severity	Indicates the alarm severity of the object. See Chapter 9, "Managing Alarms and Events."
Last Status Change	Date and time that the status of the signaling point last changed.
Status	Current status of the signaling point. Possible values are: Active Unknown Unmanaged Warning For detailed definitions of each status, see Status Definitions for Signaling Points, page E-7.
Status Reason	Reason for the current status of the signaling point. For a full list of possible reasons, see the *stateReasons.html* file. To: • You installed the MWTM in the default directory, */opt*, then the file is in the */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • You installed the MWTM in a different directory, then the help directory and file are in that directory. If the cell is too small to show all of the status reason, place the cursor over the cell to see the full text in a tooltip. The status reasons are listed in order of decreasing magnitude. If two or more reasons apply, the reason of greatest magnitude appears.
Status Reason (continued)	If the status reason is Unsupported Configuration, correct the configuration and enter the **mwtm cleandiscover** command to delete all current network data and begin a discovery of the network. If the status reason remains Unsupported Configuration, enter the **mwtm clean** command to restore the MWTM server to a state that would exist after a new installation of the MWTM, excluding the log files, which the MWTM retains. To also remove the log files, enter the **mwtm cleanall** command. For more information on the use of these commands, see the Command Reference, page B-1.

Threshold Information (RAN-O Only)

The Threshold Information section for RAN-O nodes contains:

Field	Description
Acceptable	The percentage threshold setting below which the backhaul utilization is considered acceptable. The default Acceptable threshold is 60 percent.[1]
Warning	The percentage threshold setting beyond which the backhaul utilization issues a warning. Subsequent warnings are issued only if the utilization falls below the Acceptable threshold. The default Warning threshold is 70 percent.[1]
Overloaded	The percentage threshold setting beyond which the backhaul utilization is considered overloaded. Subsequent overload messages are issued only if the utilization falls below the Acceptable threshold. The default Overloaded threshold is 80 percent.[1]

1. To change the default setting, see Editing Properties for a RAN-O Backhaul, page 6-36.

Viewing 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.

Tip   For more information about troubleshooting, see the *OSS Integration Guide for the Cisco Mobile Wireless Transport Manager 6.1*.

You can run commands and view output in the Troubleshooting section available from the MWTM client or MWTM Web interface.

To view the Troubleshooting section, in a view in the navigation tree, select an object, then click on the Troubleshooting tab in the right pane.

Note   To see which object types pertain to this tab, see Appendix A, "Client Object Map Reference."

Tip   To save the output of all executed commands to a log file, see mwtm tshootlog, page B-77.

Before you can run commands and view output, you must properly configure credentials. You can configure credentials by using the CLI command (see mwtm addcreds, page B-6) or through the MWTM client (see Configuring Login Credentials, page 3-20). If credentials are not configured, the output pane displays this message:

```
No credentials are available for this node
```

Troubleshooting Menu and Toolbar

The Troubleshooting section displays these menus and toolbar buttons for the chosen object:

Menu or Toolbar Button	Description
Category	A grouping of related commands. The MWTM provides default categories that you cannot modify. Additional categories are user-defined. You can execute all commands in a category at once by using the Execute Category button.
	Note To define additional categories and create new commands in categories, see Creating New Troubleshooting Categories and Commands, page 3-23
Command	A command or task within the chosen category. The MWTM provides commands for default categories that you cannot modify. You can execute a chosen command by 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.
▶ Execute Command	Executes the chosen command only.
	Note If you are using Microsoft Internet Explorer, the scroll bar may change position.
▶▶ Execute Category	Executes all commands in the chosen category.
	Note If you are using Microsoft Internet Explorer, the scroll bar may change position.
⬤ Cancel Execution	Stops any execution process.
💾 Save Output	Saves output on screen to a file.
🗐 Copy Output	Copies output on screen to the clipboard.
🖨 Print Output	Prints output on screen.
🗑 Clear Output	Clears all output from the screen.
Output Pane	Pane where command output appears.

Commands That Require Additional User Input

After you click the Execute Command or Execute Category button, some commands prompt you for additional input. Commands that prompt you for additional input have an ellipsis (...) at the end of the command. You must enter valid data, which appears in green as you type. Invalid data appears in red. The MWTM will not execute a command with invalid data. Once you have entered the additional input, you must click one of these buttons:

Button	Description
OK	Executes the chosen command or category of commands.
	Note If you do not provide input but leave the fields blank, and then click OK, the MWTM skips the command or commands and this message appears:
	`Skipping command.`
	The MWTM lists the commands that you skipped, but executes other commands for which you provided input.
Clear	Removes entered data from all input fields.
Cancel	Removes the input fields from the right pane.

Related Topics

- Configuring Login Credentials, page 3-20
- Troubleshooting IOS Commands on the Web, page D-4
- mwtm addcreds, page B-6
- mwtm tshootlog, page B-77

Viewing Alarms and Recent Events

To view alarms for an object, in the navigation tree, select the object (for example, a node), then click the Alarms tab in the content area.

To view recent events for an object, in the navigation tree, select the object (for example, an interface), then click the Recent Events tab in the content area.

The table in the content pane displays information about the alarms or recent events associated with the chosen object. The content pane also provides tools to perform tasks, such as setting filters and acknowledging alarms or events.

Note   For managed objects that have peers (RAN backhauls and shorthauls, ITP links and linksets, and signaling-gateway mated pairs), the MWTM displays subtabs to distinguish alarms and recent events for each peer object.

- For descriptions of the table columns, see Right-click Menus, page 9-16.
- For descriptions of alarms and events tools, see Toolbar Buttons, page 9-14.
- To understand the difference between alarms and events, see Basic Concepts and Terms, page 9-1.

Using Provisioning

This section describes how to provision objects using the MWTM web interface and provides examples. For further information, please see the *OSS Integration Guide for the Cisco Mobile Wireless Transport Manager 6.1*.

http://cisco.com/en/US/docs/net_mgmt/mobile_wireless_transport_manager/6.1/developer/guide/mwtmoss.html

Using provisioning through the MWTM Web interface, you can add, modify, and/or delete ITP, PWE3, CSG2, or GGSN objects, as follows:

ITP	Objects	Add	Modify	Delete
	Linksets	Yes	Yes	Yes
	SCTP Links	Yes	Yes	Yes
	MTP2 Links	Yes	Yes	Yes
	HSMTP2 Links	Yes	Yes	Yes
	HSL Links	Yes	Yes	Yes
	Application servers, including m3ua and sua	Yes	Yes	Yes
	Application server processes, including m3ua and sua	Yes	Yes	Yes
	Local peer objects	Yes	Yes	Yes
	m3ua objects	Yes	Yes	Yes
	sua objects	Yes	Yes	Yes
	Channelized serial interfaces (under T1/E1 controllers)	Yes	Yes	Yes
	Physical serial interfaces	No	Yes	No
	Physical T1/E1 controllers	No	Yes	No
	Physical ATM interfaces	No	Yes	No
	Physical Ethernet, FastEthernet, or GigabitEthernet interfaces	No	Yes	No

IPRAN (PWE3)	Objects	Add	Modify	Delete
	ATM Connect	Yes	Yes	Yes
	CEM Class	Yes	Yes	Yes
	CEM Group	Yes	Yes	Yes
	Interface ATM, ATM IMA, ATM Sub Interface [1]	Yes	Yes	Yes
	Interface BITS	No	Yes	No
	Interface CEM [1]	No	Yes	No
	Interface E1, T1 [1]	No	Yes	No
	Interface FastEthernet, GigabitEthernet [1]	No	Yes	No
	Interface Loopback [1]	Yes	Yes	Yes
	Interface Serial [1]	Yes	Yes	Yes
	Interface SONET [1]	No	Yes	No
	Interface Tunnel [1]	Yes	Yes	Yes
	Interface Virtual CEM [1]	No	Yes	No
	Module RTM [1]	No	Yes	No
	Node [1]	No	Yes	No
	PVC [1]	Yes	Yes	Yes
	PVP [1]	Yes	Yes	Yes
	Pseudowire Class	Yes	Yes	Yes
	Recovered Clock [1]	Yes	Yes	Yes
	Sonet AU4 Tug [1]	No	Yes	No
	Sonet AU4 [1]	No	Yes	No
	Sonet STS [1]	No	Yes	No
	Sonet Tug [1]	No	Yes	No
	Sonet VTG [1]	No	Yes	No
	Sonet CEM Group	Yes	Yes	Yes
	TDM Connect	Yes	Yes	Yes
	TDM Group	Yes	Yes	Yes
	Virtual CEM Group	Yes	Yes	Yes
CSG2	Objects	Add	Modify	Delete
	CSG2	Yes	Yes	Yes
	CSG Map	Yes	Yes	Yes
	CSG Policy	Yes	Yes	Yes
	CSG Content	Yes	Yes	Yes
	CSG Service	Yes	Yes	Yes
	CSG Billing Plan	Yes	Yes	Yes

GGSN R8	Objects	Add	Modify	Delete
	APN	Yes	Yes	Yes
	GPRS Charging Profile	Yes	Yes	Yes
	GPRS Charging Profile Defaults	Yes	Yes	Yes
	GPRS Global Commands	Yes	Yes	Yes
	Service Mode	Yes	Yes	Yes
	Test by IMSI	Yes	Yes	Yes
	Maximum PDP Contexts	Yes	Yes	Yes
	QoS Default Response Requested	Yes	Yes	Yes
	VRF [1]	Yes	Yes	Yes
	Interface, Loopback [1]	Yes	Yes	Yes
	Interface, Tunnel [1]	Yes	Yes	Yes
	Interface, GigabitEthernet [1]	No	Yes	No
Supervisor of GGSN R8	Objects	Add	Modify	Delete
	L2VLAN [2]	Yes	Yes	Yes
	VRF [1]	Yes	Yes	Yes
	Interface, Loopback [1]	Yes	Yes	Yes
	Interface, VLAN [1, 2]	Yes	Yes	Yes
	Interface, Tunnel [1]	Yes	Yes	Yes
	Interface, GigabitEthernet [1]	No	Yes	No

1.   Not all options and/or subcommands are supported.

2.   See bug about VTP Mode Transparent

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

This section contains:

- Prerequisites for Using Provisioning, page 8-49
- Using the Provisioning Wizard, page 8-50

Prerequisites for Using Provisioning

Before you can provision an object:

- You must set up:
    - Basic IP connectivity
    - SNMP community strings
    - Credentials
    - Telnet or SSH access allowed
    - (*ITP only*) Basic signaling points configured
    - (*GGSN only*) The GPRS service must be enabled in IOS

- MWTM must be able to successfully:
    - Discover the object
    - Retrieve running configuration from the object

Setting Up the MWTM to Retrieve Running Configuration from the Object

Before you can use the MWTM to provision objects, you must set up the MWTM to retrieve the running configuration from the object.

The MWTM inventory has two types of attributes:

- **Monitor attributes**—Attributes obtained from SNMP polling and/or status monitoring
- **Configuration attributes**—Attributes obtained from IOS running configuration.

Setting up the MWTM to retrieve running configuration is a two-step process. You must:

1. Supply credentials for the target node(s). For details, see Configuring Login Credentials, page 3-20.

2. Ensure that the MWTM is getting the IOS running configuration successfully from the object. There are two approaches you can use:

    - **Automatic configuration synchronization**—This is the default option. You can verify that the option in the *System.properties* file—look for the AUTO_SYNC_CONFIG field, which should be set to true. If you enable this option, the MWTM automatically retrieves the running configuration from the object after the MWTM processes a provisioning operation (from the GUI or NBAPI). During every status poll, the MWTM checks whether the running configuration has changed on the object. If the configuration has changed, the MWTM retrieves it.

    - **Manual configuration synchronization**—In certain situations, you may choose to turn off automatic configuration synchronization and manage configuration synchronization manually. You can request manual configuration synchronization using the NBAPI or the CLI. For details, see the *OSS Integration Guide for the Cisco Mobile Wireless Transport Manager 6.1*.

Using the Provisioning Wizard

✎
Note Throughout the wizard, you can click Next to continue, Previous to go back, Cancel to exit the wizard without saving changes, Refresh to reload the current window, or Submit to complete the provisioning.

To start provisioning by using the MWTM provisioning wizard:

Step 1 From the MWTM client, right-click a node in the navigation tree and choose **Provision**

or

From the MWTM web interface, click a node in the navigation tree and click the **Provision** tab in the content pane.

Step 2 Select a **Type** (and **SubType**, if applicable).

Step 3 Click **New** to create a new item of the chosen Type or select an item in the Provisioned Items list, then click **Edit** or **Delete**.

The provisioning wizard appears as shown in Figure 8-3.

Figure 8-3   *Provisioning Wizard*

There are three possible wizard stages: Basic, Features, and Summary.

✎
Note If you do not initiate activity on an active wizard screen, your session will time out after 60 seconds, and the MWTM returns to the Provision Choices window.

Step 4 Enter the relevant information at the Basic stage and click **Next** to continue.

Step 5 (Optional) Make your selections at the Features stage. Notice that as you enable features, they appear in the Wizard Steps pane under Features. Click **Next** to continue.

Step 6 (Optional) If you have added features, you can choose to configure aspects of each feature. Click **Next** to continue, or click the wizard stage in the left pane to jump between stages.

Step 7   The Summary stage appears, showing which IOS commands the MWTM will send to the object. You can optionally check the box **Write to IOS startup-config**, which saves your configuration changes permanently to the startup configuration on the object. This process can take time.

Step 8   Click **Submit** to send the provisioning to the object.

The provisioning wizard provides colored status balls in the Wizard Steps pane, which indicate:

- **White**—The stage you are in currently
- **Red**—A problem in the stage
- **Yellow**—Stage is not yet configured
- **Green**—Stage is configured successfully

Editing SNMP IP Addresses for a Node

You use the MWTM to determine which IP addresses to use for SNMP polling.

To edit a node's SNMP IP addresses, right-click a node in a window, choose **Edit > SNMP IP Addresses** in the right-click menu. The MWTM displays the Edit SNMP IP Addresses dialog box.

The Edit SNMP IP Addresses dialog box 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. The MWTM does not send SNMP queries to IP addresses in this list. This option appears only for ITP, IPRAN, or mSEF nodes.
IP Addresses for SNMP	List of all IP addresses associated with this node that the MWTM can use for SNMP polling: • By default, the MWTM places all discovered IP addresses in this list, in the order in which they are discovered. The MWTM uses the IP address at the top of the list as the primary SNMP address for the node. During SNMP polling of the node (status polling and demand polling), the MWTM first tries the primary SNMP address. If the primary is unavailable, the MWTM tries the other IP addresses, one-by-one, in descending order. • To assign a new primary SNMP address, or to change the order of the secondary IP addresses, click the **Raise Priority** and **Lower Priority** buttons to move the IP addresses up and down in the list. • You can also select IP addresses that you do not want the MWTM to use for SNMP polling. This feature is useful, for example, to separate management traffic from SMS traffic. To remove an IP address from the list, click **Remove**. The MWTM removes the IP address from the IP Addresses for SNMP list, places it in the Available IP Addresses list, and no longer uses it for SNMP polling. To enable an IP address for SNMP polling again, select the address in the Available IP Addresses list and click **Add**. The IP address moves back into the IP Addresses for SNMP list and is again available for SNMP polling. If you remove all IP addresses from the IP Addresses for SNMP list, you remove the node from the network, and the MWTM automatically labels the node Unmanaged in all MWTM windows. When you click **Save**, all MWTM windows are updated automatically to reflect the changes. This option appears only for ITP, IPRAN, or mSEF nodes.
Add	Enables one or more chosen IP addresses for SNMP polling. All chosen IP addresses in the Available IP Addresses list are moved to the IP Addresses for SNMP list where the MWTM uses them again for SNMP polling.
Remove	Disables one or more chosen IP addresses for SNMP polling. All chosen IP addresses in the IP Addresses for SNMP list are moved to the Available IP Addresses list, and are no longer used by the MWTM for SNMP polling.
Raise Priority	Moves the chosen IP addresses up in the IP Addresses for SNMP list. If you move an IP address to the top of the list, the MWTM uses that IP address as the new primary SNMP address for the node.
Lower Priority	Moves the chosen IP addresses down in the IP Addresses for SNMP list. If you remove an IP address from the top of the list, the MWTM no longer uses that IP address as the primary SNMP address for the node.

Field or Button	Description
Save	Saves changes that you made to the node information and exits the dialog box.
	When you are satisfied with your changes, click **Save**. The MWTM saves your changes and updates all MWTM windows to reflect your changes.
Cancel	Exits the dialog box without saving any changes.
	At any time, you can click **Cancel** to exit the dialog box without saving any changes.
Help	Displays online help for the dialog box.

Polling a Node

The MWTM automatically polls nodes at specified intervals. However, you can also request an immediate poll for a node. This section describes:

- Polling from the Discovery Dialog, page 8-53
- Performing a Normal Poll, page 8-54
- Performing a Clean Poll, page 8-55

Polling from the Discovery Dialog

To poll a node from the Discovery dialog box:

Step 1   Choose **Network > Network Discovery** from the MWTM main menu.

The MWTM displays the Discovery dialog box.

Step 2   Select the Discovery tab.

The MWTM displays the Discovery pane. The Discovered Nodes section of the Discovery pane lists all discovered nodes (all nodes, including new and excluded nodes, not just the nodes in the current view).

Step 3   Select one or more nodes.

> **Note**   You cannot poll a node with a Primary SNMP Address of N/A. If you select a node with a Primary SNMP Address of N/A, then the Poll Node button is dimmed and cannot be chosen. If you select more than one node, and even one of them has a Primary SNMP Address of N/A, then the Poll Node button is dimmed and cannot be clicked.

Step 4   Click **Poll Node**.

The MWTM begins a poll of the chosen nodes. During polling, the Poll Node button is dimmed, the `Selected nodes are being polled` message appears at the bottom of the Discovery dialog box, and individual nodes might display the polling status.

> **Note**   If the node has only one IP address for the MWTM to poll, and the poll fails or times out, the MWTM issues an error message. If the node has more than one IP address for the MWTM to poll, and the polls of one or more IP addresses fail or time out, the MWTM issues warning messages. If all polls fail or time out, the MWTM issues an error message.

When the `Selected nodes are being polled message` disappears and no nodes are in polling status, polling is complete. The MWTM database immediately reflects any new or changed data for the chosen nodes.

Performing a Normal Poll

A normal poll retains all objects associated with polled nodes, even objects that have been deleted and are therefore in Unknown status.

To poll one or more nodes, retaining all associated components in the MWTM database, use one of these procedures:

From a View in the Main Window

Step 1   Select a view in the navigation tree.

Step 2   Select one or more nodes in the navigation tree.

Step 3   Choose **Network > Poll Nodes > Normal Poll**.

The MWTM polls all chosen objects.

From Summary Lists

Step 1   Click **Nodes** under Summary Lists in the navigation tree.

Step 2   Select a node or adjacent node in the node table in the right pane.

Step 3   Choose **Network > Poll Nodes > Normal Poll**.

The MWTM polls that node.

From Rick-click Menu in a View

Step 1   Select a view in the navigation tree.

Step 2   Right-click a node in the navigation tree.

Step 3   Choose **Poll Node > Normal Poll** from the right-click menu.

The MWTM polls the node.

Performing a Clean Poll

A clean poll removes all network objects from the node at the completion of the poll.

To poll one or more nodes, removing and then rediscovering all associated components, use one of these procedures:

From a View in the Main Window

Step 1   Select a view in the navigation tree.

Step 2   Select one or more nodes in the navigation tree.

Step 3   Choose **Network > Poll Nodes > Clean Poll**.

The MWTM polls all chosen nodes.

From Summary Lists

Step 1   Click **Nodes** under Summary Lists in the navigation tree.

Step 2   Select a node or adjacent node in the node table in the right pane.

Step 3   Choose **Network > Poll Nodes > Clean Poll**.

The MWTM polls that node.

From Rick-click Menu in a View

Step 1   Select a view in the navigation tree.

Step 2   Right-click a node in the navigation tree.

Step 3   Choose **Poll Node > Clean Poll** from the right-click menu.

The MWTM polls the node.

Clean Node for ITP Objects

Step 1   Select a view in the navigation tree.

Step 2   Select an application server, application server process, link, or linkset in the navigation tree or in the Summary Lists tables.

Step 3   Choose **Network > Poll Nodes > Clean Poll**.

The MWTM polls all ITP nodes and adjacent nodes associated with the object.

Allowing and Disallowing Trap Processing for a Node

By default, the MWTM processes traps from all discovered nodes. However, you can prevent the MWTM from processing traps from one or more nodes. For example, if a node is experiencing many link changes and generating too many traps, you can disallow traps from that node until the situation stabilizes.

Note   If you prevent the MWTM from processing traps from a node, all MWTM clients and views connected to that MWTM server are prevented from processing traps from that node.

Also, if you prevent the MWTM from processing traps from a node, make a note of the change, and remember to reset the node when the problem is corrected or the maintenance is complete.

To prevent the MWTM from processing traps from a node, use one of these procedures:

- Uncheck the **Process Traps** check box for the node in the Node table.

Note   By default, the Process Traps column is hidden. To display the Process Traps column, right-click in the table heading and select the **Process Traps** check box.

- Right-click the node in the navigation tree, then choose **Disallow Trap Processing**.

To allow the MWTM to process traps from a node, use one of these procedures:

- Check the **Process Traps** check box for the node in the Node table.
- Right-click the node in the navigation tree, then choose **Allow Trap Processing**.

Viewing Real-Time Data

You can use the MWTM to view real-time data for chosen objects in the navigation tree. The real-time statistics for some objects (CSG2, BWG, HA, and GGSNs on SAMI cards) appear only in the MWTM web interface (see Chapter 11, "Accessing Data from the Web Interface" to view these statistics).

Note   In the MWTM client, the real-time icon [icon] appears in some tabs in the right pane. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

For more information on viewing real-time data, see:

Viewing the Syslog

The Syslog section displays all messages in the system log for the chosen node.

Note In the MWTM client, the real-time icon ![icon] appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

To view the Syslog section, in a view in the navigation tree, select a node, then click the Syslog tab in the content area.

The Syslog section displays these columns for the chosen node:

Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run.
	This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Timestamp	Date and time of the syslog message from the node.
Severity	Severity of the syslog message. Possible values are: • **Alert**—Conditions that require immediate action. • **Critical**—Critical conditions. • **Debug**—Debug conditions, log FTP commands, and WWW URLs. • **Emergency**—System unusable conditions. • **Error**—Error conditions. • **Info**—Information conditions. • **Notice**—Normal but significant conditions. • **Warning**—Warning conditions.
Facility	Name of the facility that generated the syslog message, such as SYS, SNMP, CS7MTP3, or CS7PING.
Name	Short text identifier for the message type. A facility name in conjunction with a message name uniquely identifies a syslog message type.
Message	Text of the syslog message.

Viewing CPU Performance

The Performance tab provides real-time chart and table statistics about:

- CPU Processes, page 8-58
- CPU Utilization, page 8-59
- Memory Utilization, page 8-60

Note In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

To view real-time CPU performance statistics, in a view in the navigation tree, select a node, then click the Performance tab in the content area. The Performance tab appears in the right pane when you select any of these nodes: CSG1, CSG2, GGSN, BWG, CSR, HA, RAN-SVC, ITP.

Note In some cases, users can notice a difference in the number of CPUs reported by the CPU Utilization, CPU Processes, and Memory Utilization selections. The CPU MIBs do not report statistics for cards that are in standby mode (for example, supervisor cards). However, the memory MIB does report memory utilization for standby cards. Because of this difference, the Memory Utilization selection can display a greater number of CPUs than the CPU Utilization and CPU Processes selections.

Also, because the information for memory and CPU statistics comes from different MIBs, the CPU descriptions can vary. Users can correlate the information by comparing the descriptions available among the CPU Utilization, CPU Processes, and Memory Utilization selections. Devices that support the CISCO-MEMORY-POOL-MIB show only the description of the main processor.

CPU Processes

To view real-time CPU processes for the node, click the View drop-down arrow in the MWTM client or MWTM web interface, and select **CPU Processes**.

The MWTM client displays information about CPU processes in a table with slot- and CPU-specific tabs. When you click the tabs for a specific slot and CPU, the MWTM shows CPU process information for the selected CPU. If only a single CPU exists, no tabs for slots or CPUs appear. The MWTM displays information for the CPU in the right pane.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

Each table contains:

Field or Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
PID	Process identifier.

Field or Column	Description
Name	Name of the process.
Time Created	Total time since the process was created.
Total Runtime	CPU time the process has used.
Times Invoked	Number of times the process was invoked.
Average Runtime	Average CPU time for each process invocation.
5 Sec %	Average CPU utilization percentage for the node over the last 5 seconds.
1 Min %	Average CPU utilization percentage for the node over the last minute.
5 Min %	Average CPU utilization percentage for the node over the last 5 minutes.
Priority	Process queue priority. Possible values are: • Low • Normal • High • Critical

CPU Utilization

To view real-time CPU utilization for the node, click the View drop-down arrow in the MWTM client, and select **CPU Utilization**.

The MWTM client displays a CPU utilization chart with:

- A Summary tab that shows the combined utilization of all CPUs on the node
- Slot- and CPU-specific tabs that show utilization for a selected CPU

Note   The MWTM web interface displays this data in tabular, instead of chart, format. To view the tabular data in its raw format, in the *Server.properties* file, set the WEB_DEBUG parameter to true.

The CPU summary chart displays a vertical band whenever at least one its CPUs is above the normal threshold. Status balls on the CPU-specific tabs indicate the highest threshold status of all data series for the CPU for the last polling interval.

The CPU-specific charts display horizontal bands to show overloaded, warning, and acceptable thresholds; you must configure the CPU rising and falling thresholds on the device to display these bands in the MWTM. The falling threshold corresponds to the boundary between the acceptable and warning bands. The rising threshold corresponds to the boundary between the warning and overloaded bands. For multi-CPU devices, these thresholds apply only to the main CPU.

GUI Elements	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Poll Interval	Label that shows the current poll interval in seconds.
Percentage	Y-axis label that shows percentage of CPU utilization over time.

GUI Elements	Description
Time	X-axis label that displays a real-time scale and the server time zone.
Legend	Identifies the data series currently showing in the chart.
	• 5 sec—Average CPU utilization percentage for the node over the last 5 seconds.
	• 1 min—Average CPU utilization percentage for the node over the last minute.
	• 5 min—Average CPU utilization percentage for the node over the last 5 minutes.
	• No Data—Color-coded value that indicates no data is available to display.
	• CPU Threshold Crossed—In the Summary-tab chart, color-coded value that indicates when CPU utilization is above normal.
	• Overloaded—In a CPU-tab chart, color-coded value that indicates when CPU utilization is in the overloaded zone.
	• Warning—In a CPU-tab chart, color-coded value that indicates when CPU utilization is in the warning zone.
	• Acceptable—In a CPU-tab chart, color-coded value that indicates when CPU utilization is in the acceptable zone.

Memory Utilization

To view CPU memory utilization for the node, click the View drop-down menu in the MWTM client or MWTM web interface, and select **Memory Utilization**.

The MWTM client displays memory utilization in a table with:

- A Summary tab that shows the combined memory utilization of all CPUs on the node
- Slot- and CPU-specific tabs that show memory utilization for a selected CPU

Note Depending on the device, memory utilization statistics may not be available from the management information base (MIB). Devices that support the CISCO-ENHANCED-MEMORY-POOL-MIB have detailed memory information for each CPU. Devices that support the CISCO-MEMORY-POOL-MIB have memory information only for the CPU of the main processor. For these devices, the memory utilization table shows only one entry even though these devices can have multiple CPUs. In these cases, the CPU Description column indicates *CPU of main processor*.

Summary Tab

The Summary tab displays a tabular overview of all CPUs in the chosen node to enable users to easily observe problem areas.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Summary table.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Summary table contains:

Field or Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
CPU	Slot number (if known) and CPU number.
CPU Description	Type of CPU.
Processor Memory	Percentage of available processor memory in use.
I/O Memory	Percentage of available I/O memory in use.

CPU-specific Tabs

The CPU-specific tabs display tabular information for the selected slot and CPU. If only a single CPU exists, no slot or CPU tabs appear and the MWTM displays the information for the CPU in the right pane.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

Each CPU-specific table contains:

Field or Column	Description
Poll Interval	Poll interval used to collect data for the table. **Note** Polling for memory statistics takes longer than for CPU statistics. If excessive timeouts occur for memory polling, you can increase the number of milliseconds for the timeout by changing the MEMORY_POLLER_TIMEOUT_INCREMENT in the *Server.properties* file.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Memory Type	The type of memory, either processor memory or I/O memory.
Utilization	Percentage of utilization for each type of memory.
Total	Total amount of memory for each memory type.
Used	Amount of memory that is used for each memory type.
Free	Amount of free (unused) memory for each memory type.
Largest Free[1]	The largest available memory unit.
Valid[1]	Whether or not the memory is valid for use.

1. This column is hidden by default. Right-click in the column header and check the check box next to the heading label to display it.

Viewing Trap Settings

The Trap Settings section displays all trap settings for the chosen node, as well as all hosts and port numbers to which the node sends traps.

If you have implemented MWTM User-Based Access, this option is available to users with authentication level 5 (System Administrator).

> **Note** In the MWTM client, the real-time icon ![icon] appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

To view the Trap Settings section, in a view in the navigation tree, select a node, then click on the Trap Settings tab in the content area.

The Trap Settings section displays these columns for the chosen node:

Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Release 2 Trap Settings (ITP only)	Indicates whether these ITP release 12.2(4)MB4 trap settings are enabled: • SCTP Remote Address Change • Linkset State Change • Link State Change • Link Congestion State Change • Link Receive Utilization Change • Link Send Utilization Change • Route State Change • GTT MAP State Change
Release 3 Trap Settings (ITP only)	Indicates whether these ITP release 12.2(4)MB5 through 12.2(4)MB9a trap settings are enabled: • ASP State Change • AS State Change • SGMP State Change This column might not be visible if the ITP does not support ITP release 12.2(4)MB5 through 12.2(4)MB9a traps.

Column	Description
Release 4 Trap Settings (ITP only)	Indicates whether these ITP release 12.2(4)MB10 through 12.2(20)SW trap settings are enabled: • Linkset State Change • Link State Change • Link Congestion State Change • Link Receive Utilization Change • Link Send Utilization Change • Route Destination State Change • Route Mgmt. State Change • Route Table Load • GTT MAP State Change • GTT Table Load • ASP Congestion Change • SNMP Congestion Change This column might not be visible if the ITP does not support ITP release 12.2(4)MB10 through 12.2(20)SW traps.
Release 6 Trap Settings (ITP only)	Indicates whether the following ITP release 12.2(25)SW3 trap setting is enabled: • MLR Load Table This column might not be visible if the ITP does not support ITP release 12.2(25)SW3 traps.
RAN Trap Settings (RAN-O only)	Trap settings for the node. These settings include: • GSM State Change • UMTS State Change
Local IP Address	IP address of a local host to which the node sends traps.
Port	Port to which the node sends traps.
Trap Version	Trap version sent to this IP address and port.
Community String	SNMP community name used by the node for read access to the information maintained by the SNMP agent on the node.

Viewing Data for Interfaces

> **Note** The MWTM client provides charts and tables to display the performance and error information for the chosen interface. The MWTM web interface displays the same information in a tabular format.

For most interfaces, the MWTM displays interface performance and error information in separate tabs in the right pane. However, depending on variables such as node type, card type, interface type, IOS software image, and the running configuration on the node itself, performance and error statistics may not be available for the chosen interface.

Note
- Interface performance and error statistics are not available for T1, E1, Synchronous Digital Hierarchy (SDH), or RAN-O shorthaul interfaces.
- Statistics are also unavailable for these ATM interface types: ATM subinterface and ATM layer.

For the chosen interface, you can view:

Real-Time Interface Performance

To view real-time interface performance, select the interface in the navigation tree, then click the Interface Performance tab.

Note In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

You may be prompted to start an in-band poller if polling cannot be done out of band.

The Interface Performance tab contains:

GUI Element[1]	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Poll Interval	Label that shows the current poll interval in seconds.
Last Poll	Label that identifies when the last poll occurred.
Bits or Bytes/Sec (MWTM client) or Current Rate (MWTM web interface)	**MWTM client:** The MWTM displays separate charts for send (out) and receive (in) traffic on the chosen interface. The Y-axis label that displays the interface traffic rate in bits or bytes per second. The default is bits per second. To change the charts to show bytes per second, uncheck the Show Details in Bits instead of Bytes check box in the Preferences window (General Display Settings, page 5-4). The Y axis automatically scales to the interface speed. **MWTM web interface:** Displays the interface traffic rate in bits or bytes per second.
% Utilization	For interface speeds greater than zero, the right side of the Y axis displays the percent utilization of the interface, on a scale from 0 to 100%.
Time	X-axis label that displays a real-time scale and the server time zone.

GUI Element[1]	Description
Legend	Identifies the data series currently showing in the chart.
	• **Out**—Shows the outgoing (transmit) traffic rate of the chosen interface.
	• **In**—Shows the incoming (receive) traffic rate of the chosen interface.
	• **No Data**—Data is not available. A vertical bar appears in the chart.
Show/hide right-click menu	Provides options to show or hide one or more parts of a data series. See Right-click Menu, page 8-95, for descriptions of the options.
(*MWTM Web only*) Total Count Since Reboot (bits)	Total number of bits since reboot.
(*MWTM Web only*) Interface Speed (bits/sec)	Interface send and receive speed in bits per second.

1.   The MWTM web interface displays the same information in tabular, not chart, format.

Real-Time Interface Errors

To view real-time interface errors, select the interface in the navigation tree, then click the Interface Errors tab.

Note   In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

You may be prompted to start an in-band poller if polling cannot be done out of band.

The Interface Errors tab contains:

GUI Element	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Reset Counters	Opens the Reset Counters dialog box to configure the method of polling. See Changing Real-Time Poller and Counter Settings, page 5-21.
Poller Counter Mode	Label that displays the polling mode that you configure in the Reset Counters dialog box.
Poll Interval	Label that shows the current poll interval in seconds.
Last Poll	Label that identifies when the last poll occurred.

GUI Element	Description

Interface Errors	Table that shows this information for the chosen interface:
	
	• Data Type:
	
	   – In Errors—Incoming (receive) errors.
	
	   – Out Errors—Outgoing (transmit) errors.
	
	   – In Discards—Incoming, discarded packets.
	
	   – Out Discards—Outgoing, discarded packets.
	
	   – Unknown Protocol Packets Received—For packet-oriented interfaces, the number of received packets that were discarded because of an unknown or unsupported protocol. For character-oriented or fixed-length interfaces that support protocol multiplexing, the number of received transmission units that were discarded because of an unknown or unsupported protocol. For interfaces that do not support protocol multiplexing, the count will always be 0.
	
	• Counts—Error counts since the last reboot.
	
	• Rates (per sec)—Error rates since the last reboot.

Output Queue Size	The length of the output packet queue (in packets). When a router receives a packet, it typically forwards it to another interface. The packet enters a queue on the output interface before it is actually sent. The interface typically has a buffer that can hold a fixed number of packets in the queue. When the output queue overflows, the router begins to discard packets.
Interface Errors / Sec	Chart that shows interface errors per second for the chosen interface. The Y axis shows errors per second. The X axis shows a real-time scale and the server time zone. A legend provides color-coded descriptions of the error types for the incoming and outgoing traffic. **Note** This chart is only available in the MWTM client interface. The MWTM web interface shows the same data in tabular format.

Viewing Data for ITP Objects

You use the MWTM to view detailed statistics for any of these ITP objects:

- Application Servers
- Application Server Process Associations
- Links
- Linksets
- Signaling Gateway Mated Pairs

To display detailed statistics for an object:

- In the MWTM client—In a view in the navigation tree, right-click an object, then choose **View > Real-Time Data and Charts**. The MWTM displays the Statistics Details window for the object.

Note   The MWTM server automatically reflects updates for the objects received in this window.

Changes you make in this window might not be reflected throughout the MWTM until the next poll (by default, every 15 seconds). For information about changing the poll interval, see Poll Settings, page 8-75.

- In the web interface—Click on the relevant object (Application Server, Linkset, and so on) in the navigation tree and choose the relevant tab in the content pane.

The Statistics Details window in the MWTM client has a navigation tree, which contains:

Component	Applicable To	Content Links
Poll Settings	All objects	Poll Settings
Right-click menu	Links	Right-Click Menu

The Statistics Details window and the MWTM web interface may contain these tabs in the content pane:

Tab	Applicable To	Content Links
Alarms	All objects	Viewing Alarms and Recent Events
Charts (MWTM client only)	• Application servers • Application server process associations • Links • Linksets	Charts: Application Servers and Application Server Process Associations Charts: Links and Linksets
Details	All objects	Viewing Details
Interface Details	• Application Server Process Associations • Links • Signaling Gateway Mated Pairs	Interface Details
Linkset Access Lists	Linksets	Viewing ITP Linkset Access Lists
Notes	All objects	Viewing Notes
Q.752 Measurements	Links	Q.752 Measurements
Recent Events (MWTM client only)	All objects	Viewing Alarms and Recent Events
SCTP Association Configuration Details	• Application Server Process Associations • Links • Signaling Gateway Mated Pairs	SCTP Association Configuration Details

Tab	Applicable To	Content Links
SCTP Association Statistics Details	• Application Server Process Associations • Links • Signaling Gateway Mated Pairs	SCTP Association Statistics Details
Statistics	• Application Servers • Application Server Process Associations • Links • Linksets	Statistics: Application Servers Statistics: Application Server Process Associations Statistics: Links and Linksets
Status Contributors	Application Servers	Viewing Status Contributors
Status Details	Links	Status Details
Troubleshooting	• Application Servers • Application Server Process Associations • Links • Linksets • Signaling Gateway Mated Pairs	Viewing Troubleshooting

Charts: Application Servers and Application Server Process Associations

You use the MWTM to view real-time MTP3 and ASP packet rate information for the chosen application server or application server process association. To do so, click the Charts tab in the Statistics Details window for an application server or application server process association, then click the relevant tab and the chosen chart appears.

The Statistics Details: Charts section for application servers and application server process associations contains:

Tab	Description	Applicable To
MTP3 Packet Rate	Displays MTP3 packet rate information for a chosen application server.	Application servers
ASP Packet Rate	Displays real-time application server process packet rate information for a chosen application server.	Application servers
Packets From ASP Rate	Displays real-time rate information for packets received by the application server process for the chosen application server or application server process association.	Application servers and application server process associations
Packets To ASP Rate	Displays real-time rate information for packets sent to the application server process by the chosen application server or application server process association.	Application servers and application server process associations

Tab	Description	Applicable To
Packets From MTP3 Rate	Displays real-time rate information for packets received by the chosen application server or application server process association, from the MTP3 layer.	Application servers and application server process associations
Packets To MTP3 Rate	Displays real-time rate information for packets sent to the MTP3 layer from the chosen application server or application server process association.	Application servers and application server process associations

The tabs in the Statistics Details: Charts section for application servers and application server process associations contain:

Field or Button	Description
Time window (mins)	Drop-down list box used to specify the length of time appear in the chosen chart. Valid selections are 1, 2, 5, 10, 20, 40, or 60 minutes. The default selection is 5 minutes.
<Type> Rate Chart	Displays one of these rate charts for the chosen application server or application server process association as a function of time: • MTP3 Packet Rate Chart • ASP Packet Rate Chart • Packets From ASP Rate Chart • Packets To ASP Rate Chart • Packets From MTP3 Rate Chart • Packets To MTP3 Rate Chart
<Type> Rate Chart (continued)	To see the exact time and data coordinates for a data point, left-click the data point. The coordinates appear in the format (*hh*:*mm*:*ss*, *dd*.*dd*), where: • *hh*:*mm*:*ss* is the time for that data point in hours, minutes, and seconds. • *dd*.*dd* is the MTP3 packet rate for that data point. The Time window (mins) field specifies the total visible time in the chart. New data points are added to the right side of the chart. When the chart reaches the end of the time window (for example, after 5 minutes, if the Time window (mins) field is set to 5), new data points continue to be added to the right side of the chart, while old data points drop off the left side of the chart. If a poll is missed (for example, as a result of an SNMP timeout), the MWTM ignores the missing data point, stops drawing the line, and waits for the next valid data point to begin drawing the line again. To scroll left, right, up, or down in the chart, drag the cursor while holding down **Ctrl** and the left mouse button. To zoom in on a section of the chart, drag the cursor while pressing **Shift** and the left mouse button. To reset the chart to the default view and scaling, click **Reset**.

Field or Button	Description
AS or ASPA	Displays color-coded icons for the application server process associations associated with the application server, or for the application server process association.
	To add the data for an application server process association to the chart, click the icon in this field. To remove the data from the chart, click the icon again.
	You use the MWTM to customize the symbols, line styles, and colors assigned to data points in real-time data charts. For more information, see Changing Charts Settings, page 5-11.
Reset	If you scrolled or zoomed the chart, resets the chart to the default view and scaling.
Grid On	Superimposes a graphic grid on the chart. The grid can make the data easier to read.
Grid Off	Removes the graphic grid from the chart.
Help	Displays online help for the current window.

Charts: Links and Linksets

You use the MWTM to view real-time received, sent, and dropped information for the chosen link or linkset. To do so, click the Charts tab in the Statistics Details window for a link or linkset, then click the relevant tab and the chosen chart appears.

The Statistics Details: Charts section for links and linksets contains:

Tab	Description
ReceivedUtilization	Displays real-time ReceivedUtilization information for the chosen link or linkset.
SendUtilization	Displays real-time SendUtilization information for the chosen link or linkset.
PktsRcvdPerSec	Displays real-time packets-received-per-second information for the chosen link or linkset.
PktsSentPerSec	Displays real-time packets-sent-per-second information for the chosen link or linkset.
BitsRcvdPerSec or BytesRcvdPerSec	Displays real-time bits-received-per-second information for the chosen link or linkset (or bytes-received-per-second information, if you unchecked the Show Details in Bits Instead of Bytes check box in the Preferences window).
BitsSentPerSec or BytesSentPerSec	Displays real-time bits-sent-per-second information for the chosen link or linkset (or bytes-sent-per-second information, if you unchecked the Show Details in Bits Instead of Bytes check box in the Preferences window).
Drops	Displays drops information for the chosen link or linkset.

The tabs in the Statistics Details: Charts section for links and linksets contain:

Field or Button	Description
Linkset	Drop-down list box used to select the linkset from whose perspective data should be visible. By default, data appears from the perspective of the chosen linkset. To display data from the perspective of the adjacent linkset, select it in this list box.
Time window (mins)	Drop-down list box used to specify the length of time visible in the chosen chart. Valid selections are 1, 2, 5, 10, 20, 40, or 60 minutes. The default selection is 5 minutes.
<Type> Chart	Displays one of these charts for the chosen link (and all links on the linkset) or linkset (up to 16 links) as a function of time: • Received Utilization Chart • Send Utilization Chart • Packets Received Chart • Packets Sent Chart • Bits or Bytes Received Chart • Bits or Bytes Sent Chart • Drops Chart To see the exact time and data coordinates for a data point, left-click the data point. The coordinates are visible in the format (*hh*:*mm*:*ss*, *dd*.*dd*), where: • *hh*:*mm*:*ss* is the time for that data point in hours, minutes, and seconds. • *dd*.*dd* is the receive utilization percentage for that data point. **Note** (For ReceivedUtilization and SendUtilization only) For serial and HSL links on Cisco 7507 and 7513 series routers, the visible utilization data can vary by up to 5% from the actual utilization—the MWTM might even display utilization data of more than 100%. This variance results from the synchronization of Layer 2 counters between the Versatile Interface Processor (VIP) CPU and the Route Switch Processor (RSP) CPU on 7500 series routers. This variance does not occur for links on Cisco 2600, 7200, or 7300 series routers.

Field or Button	Description
<Type> Chart (continued)	If more than one link appears in the SLC field, you can compare the visible data to that of one or more of the other links by clicking the color-coded icons. To remove the data for the additional links, click the icons again.
	The Time window (mins) field specifies the total visible time in the chart.
	New data points are added to the right side of the chart. When the chart reaches the end of the time window (for example, after 5 minutes, if the Time window (mins) field is set to 5), new data points continue to be added to the right side of the chart, while old data points "drop off" the left side of the chart.
	If a poll is missed (for example, as a result of an SNMP timeout), the MWTM ignores the missing data point, stops drawing the line, and waits for the next valid data point to begin drawing the line again.
	To scroll left, right, up, or down in the chart, drag the cursor while holding down **Ctrl** and the left mouse button.
	To zoom in on a section of the chart, drag the cursor while pressing **Shift** and the left mouse button.
	To reset the chart to the default view and scaling, click **Reset**.
SLC	Displays up to 17 color-coded icons. One for:
	• Each link (SLC) in the chosen chart, up to 16 total links.
	• The average of all SLCs.
	To add the data for a link or for the average to the chart, click the icon in this field. To remove the data from the chart, click the icon again.
	You use the MWTM to customize the symbols, line styles, and colors assigned to data points in real-time data charts. For more information, see Changing Charts Settings, page 5-11.
Show threshold line for (Linksets only, ReceivedUtilization or SendUtilization)	Draws a horizontal line on the chosen utilization chart, indicating the receive and send threshold for the chosen link.
	If you do not want to draw a threshold line, select None. This is the default setting.
Scale to threshold (Linksets only, ReceivedUtilization or SendUtilization)	Scales the chosen utilization chart in order to draw the threshold chosen in the Show threshold line for field. To:
	• Scale the chart, check this check box.
	• Remove the scaling from the chart, uncheck this check box. This is the default setting.
	The Scale to threshold check box is not available if the **Show threshold line for** field is set to None.
Reset	If you scrolled or zoomed the chart, resets the chart to the default view and scaling.
Grid On	Superimposes a graphic grid on the chart. The grid can make the data easier to read.
Grid Off	Removes the graphic grid from the chart.
Help	Displays online help for the current window.

Interface Details

You use the MWTM to view real-time interface details for the chosen application server process association, link, or signaling gateway-mated pair.

The Statistics Details: Interface Details section contains:

Section	Description
Configuration Information	Interface type, speed, and MTU. For SCTP links, this section also provides the IP address, mask, and physical address.
Status Information	Length of time the interface is up, administrative and operational status, and status of the line protocol.
Statistics Information	Number of bytes and packets that have been received and transmitted on the interface.
Errors Information	Number of packet errors and discarded packets.

Configuration Information

The Configuration Information subsection in the Statistics Details: Interface Details section for application server process associations, links, and signaling gateway mated pairs contains:

Field	Description
Type	Type of interface, such as Ethernet.
MTU	Size, in bytes, of the largest datagram that can send or receive on the interface.
Speed (Bits/Sec)	Estimate, in bits per second, of the interface's current bandwidth. If the interface does not vary in bandwidth; or, if no accurate estimate can be made, this field displays the nominal bandwidth.
IP Address	(SCTP links only) IP address corresponding to the media-dependent physical address. If the interface does not have such an address (for example, a serial line), this field displays N/A.
IP Mask	(SCTP links only) Subnet mask corresponding to the media-dependent physical address. If the interface does not have such an address (for example, a serial line), this field displays N/A.
Physical Address	(SCTP links only) Address of the interface at the protocol layer immediately below the network layer in the protocol stack. If the interface does not have such an address (for example, a serial line), this field displays N/A.

Note   This section does not appear if the application server process association, link, or signaling gateway mated pair has been offloaded to a Service and Application Module for IP () card.

Status Information

The Status Information subsection in the Statistics Details: Interface Details section for application server process associations, links, and signaling gateway mated pairs contains:

Field	Description
Uptime	Time the interface is up, in days, hours, minutes, and seconds.
Admin Status	State of the interface. Possible values are: • Up • Down • Testing
Operational Status	Current operational state of the interface. Possible values are: • Up • Down • Testing • Unknown • Dormant
Line Protocol Status	Current state of the line protocol. Possible values are: • **Up**—Software processes that handle the line protocol consider the line to be usable (that is, keepalives are successful). • **Down**—Software processes that handle the line protocol consider the line to be unusable. You can use the Line Protocol together with Operational Status to troubleshoot interface connection problems. For example, if Operational Status is Up, but Line Protocol is Down, the interface has detected a carrier on the physical layer, but clocking or framing problems might occur.

Statistics Information

The Statistics Information subsection in the Statistics Details: Interface Details section for application server process associations, links, and signaling gateway mated pairs contains:

Field	Description
Bytes In per Sec	Number of bytes received on the interface per second, including framing characters.
Bytes Out per Sec	Number of bytes sent on the interface per second, including framing characters.
Packets In per Sec	Number of packets delivered per second to a higher-layer protocol.
Packets Out per Sec	Total number of packets that higher-level protocols requested to be sent to the network per second, including those that were discarded or not sent.

Errors Information

The Errors Information subsection in the Statistics Details: Interface Details section for application server process associations, links, and signaling gateway mated pairs contains:

Field	Description
In Discards	Number of inbound packets that were discarded, even though no errors were detected to prevent their delivery to a higher-layer protocol. For example, a packet might be discarded to free buffer space.
Out Discards	Number of outbound packets that were discarded, even though no errors were detected to prevent their delivery to a higher-layer protocol. For example, a packet might be discarded to free buffer space.
In Errors	Number of inbound packets that contained errors that prevented their delivery to a higher-layer protocol.
Out Errors	Number of outbound packets that were not sent because of errors.

Poll Settings

To view or change poll settings for the object's Statistics Details window in the MWTM client interface, click **Poll Settings** in the left pane. The MWTM displays the Poll Settings pane in the right pane.

The Poll Settings pane contains:

Field	Description
Poll Interval (secs)	New poll interval for the object's Statistics Details window, in seconds. Enter the new poll interval in this field. The valid range is 15 seconds to an unlimited number of seconds. The default value is 15 seconds.
Current Poll Interval	Current poll interval for the object's Statistics Details window, in seconds.
Number of Polls Received	Total number of polls received since polling began for the object's Statistics Details window.
Running Time	Total elapsed time since polling began for the object's Statistics Details window.
Last Message	Date and time of the last poll for the object's Statistics Details window.
Poll Counter Mode	Displays the current mode for poll counters, and the date and time that counters were last reset. Possible modes are: • **Since Reboot**—Counters display values aggregated since the last reboot of the node, or since the node last reset the counters. • **Since Last Poll**—Counters display values aggregated since the last poll. • **Since User Reset**—Counters display values aggregated since the last time they were reset by the user.
Reset Counters	Opens the MWTM Reset Counters dialog box, which you use to change MWTM poller and counter settings. For more information, see Changing Real-Time Poller and Counter Settings, page 5-21.

Q.752 Measurements

The Statistics Details: Q.752 Measurements section for links contains:

Statistics for links associated with the chosen linkset are visible in the left column, and for links associated with the adjacent linkset in the right column.

Error Information

The Error Information subsection contains:

Field	Description
Link Failure Count	Number of times the link was unavailable for signaling.
Alignment Error Count	Number of errors detected during link alignment. Link alignment occurs at start up, or when trying to bring up a failed link.
Negative ACKs Count	Number of errors detected during link acknowledgement.
Status Indicator Busy Count	Number of times the Status Indicator Busy was received.

Inhibited Information

The Inhibited Information subsection contains:

Field	Description
Local Inhibit Onset	Number of times a local ITP administrator has inhibited the link (that is, set the link to prevent traffic from flowing).
Local Inhibit Duration %	Percentage of time the link is locally inhibited since the last reboot of the ITP, or since ITP last reset the counters.
Remote Inhibit Onset	Number of times a remote ITP administrator has inhibited the link.
Remote Inhibit Duration %	Percentage of time the link is remotely inhibited since the last reboot of the ITP, or since ITP last reset the counters.

Retransmitted Information

The Retransmitted Information subsection contains:

Field	Description
Packets Retransmitted per Sec	Number of packets that the link transmits, per second.
Bytes Retransmitted per Sec	Number of bytes that the link transmits, per second.

Field	Description
Local Automatic Change Over Count	Number of *local automatic changeover* events detected.
Local Automatic Change Back Count	Number of *local automatic changeback* events detected.

Congested Information

The Congested Information subsection contains:

Field or Column	Description
Congestion Occurrences	Number of times congestion has occurred on the link.
Congestion Duration %	Percentage of time the link is congested since the last reboot of the ITP, or since ITP last reset the counters.
Congestion Level	Level of congestion: 1, 2, or 3.
Packets Lost	Number of packets lost by the link as a result of congestion at each level.
Packets Lost per Sec	Number of packets per second that the link loses, as a result of congestion at each level.
Times At Level With Packet Loss	Number of times the link is congested and has lost packets at each level.

Right-Click Menu

The Statistics Details window for a link in the MWTM client interface provides a right-click menu. To see this menu, right-click a link in the navigation tree of the Statistics Details window. The menu displays:

Menu Command	Description
Delete Item	Deletes the currently chosen link from the MWTM database. The MWTM displays the Confirm Deletion dialog box, To:
	• Delete the chosen link, click **Yes**. The MWTM deletes the link from the MWTM database and closes the Confirm Deletion dialog box.
	• Retain the chosen link, click **No**. The MWTM retains the link in the MWTM database and closes the Confirm Deletion dialog box.
	• Prevent the MWTM from displaying the Confirm Deletion dialog box, check the **Do not show this again** check box.
	Note If you check the **Do not show this again** check box, and you later decide you want the MWTM to begin displaying the Confirm Deletion dialog box again, you must check the Confirm Deletions check box in the General GUI settings in the Preferences window. For more information, see the description of the Confirm Deletions check box in Startup/Exit Settings, page 5-4.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Network Administrator (level 4) and higher.
Ignore Item	Ignores the link that you click at the next polling cycle.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 2) and higher.
Unignore Item	Stops ignoring the chosen link at the next polling cycle.
	If you have implemented MWTM User-Based Access, this option is available to users with authentication level Power User (level 2) and higher.

SCTP Association Configuration Details

You use the MWTM to view Stream Control Transmission Protocol (SCTP) association configuration details for the chosen application server process association, link, or signaling gateway-mated pair.

The Statistics Details: SCTP Assoc. Config Details section contains:

Section	Description
Configuration Information	Status information, length of time the link is up, remote and local numbers, and IP address information.
Local IP Address Information	Local IP addresses associated with the link and the length of time each address is up.

Section	Description
Remote IP Address Information	Remote IP addresses associated with the link, the length of time each address is up, and SCTP retry information.
Transmission Configuration Information	The MTU, number of inbound and outbound streams, retry timeouts, local and remote receive window sizes, and chunk bundling information.

Configuration Information

The Configuration Information subsection in the Statistics Details: SCTP Assoc. Config Details section for application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description
Status	Current status of the SCTP association. Possible values are:
	• Closed
	• CookieWait
	• CookieEchoed
Status (continued)	• DeleteTCB
	• Established
Status (continued)	• ShutdownAckSent
	• ShutdownPending
	• ShutdownReceived
	• ShutdownSent
	For detailed information about each status, refer to RFC 2960, Stream Control Transmission Protocol.
Uptime	Time the link is up, in days, hours, minutes, and seconds.
Remote Port	Remote port number for the SCTP association.
Local Port	Local port number for the SCTP association.
Primary IP Address	Designated primary IP address for the SCTP association.
Effective IP Address	IP address that the SCTP association uses.

Local IP Address Information

The Local IP Address Information subsection in the Statistics Details: SCTP Assoc. Config Details section for application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description
IP Address	Local IP addresses associated with the link.
Uptime	Time each local IP address associated with the link is up, in days, hours, minutes, and seconds.

Remote IP Address Information

The Remote IP Address Information subsection in the Statistics Details: SCTP Assoc. Config Details section for application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description
IP Address	Remote IP addresses associated with the link.
Uptime	Time each remote IP address associated with the link is up, in days, hours, minutes, and seconds.
Retry Timeout (msecs)	Current SCTP Retransmission Timeout (T3-rtx timer).
Maximum Retries	Maximum allowable number of retransmissions before this IP address is considered inactive.
Retries	Current retransmission count.

Transmission Configuration Information

The Transmission Configuration Information subsection contains:

Field	Description
MTU	Maximum transmission unit (MTU) size that this SCTP association uses. Out of the IP addresses that the SCTP association uses, the smallest size that is supported.
In Streams	Inbound streams as negotiated when the SCTP association was started.
Out Streams	Outbound streams as negotiated when the SCTP association was started.
Maximum Retries	Maximum number of data retransmissions in the SCTP association context.
Local Receive window Size	Current local receive window size for this SCTP association.
Remote Receive window Size	Current local send window size for this SCTP association.
Initial Retry Timeout (msecs)	Initial timeout value, in milliseconds, that the SCTP implementation permits for the retry timeout.
Minimum Retry Timeout (msecs)	Minimum timeout value, in milliseconds, that the SCTP implementation permits for the retry timeout.
Maximum Retry Timeout (msecs)	Maximum timeout value, in milliseconds, that the SCTP implementation permits for the retry timeout.
Bundle Chunks	Indicates whether the SCTP protocol allows chunks to be bundled into a single datagram as follows. Valid values are: • **true (1)**—Chunks are bundled. • **false (2)**—Chunks are not bundled.
Bundle Timeout (msecs)	Time, in milliseconds, to wait to allow data chunks to accumulate so that they can be transmitted in the same datagram.

SCTP Association Statistics Details

You use the MWTM to view Stream Control Transmission Protocol (SCTP) association statistics details for the chosen application server process association, link, or signaling gateway-mated pair.

The Statistics Details: SCTP Assoc. Stats Details section contains:

Section	Description
Remote IP Address Information	IP addresses, round-trip times, failure counts, and IP address status and heartbeat.
Statistics Information (per sec) Rates	Sent and received counts for packets and chunks.

Remote IP Address Information

The Remote IP Address Information subsection in the Statistics Details: SCTP Assoc. Stats Details section for application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description
IP Address	Remote IP addresses associated with the link.
Smoothed Round Trip Time (msecs)	Average, in milliseconds, of all round-trip times between the local and remote systems on an IP network.
Failure Count	Number of times the remote IP address was marked as failed.
Heartbeat Status	Current status of the heartbeat associated with the remote IP address. Valid values are Active and Inactive.
IP Status	Current status of the remote IP address. Valid values are Active and Inactive.

Statistics Information (per sec) Rates

The Statistics Information (per sec) Rates subsection in the Statistics Details: SCTP Assoc. Stats Details section for application server process associations, SCTP links, and signaling gateway mated pairs contains:

Field	Description
Packets Sent	Number of IP datagrams that this SCTP association sends per second.
Packets Received	Number of IP datagrams that this SCTP association receives per second.
Control Chunks Sent	Number of control chunks that this SCTP association sends per second.
Control Chunks Rec	Number of control chunks that this SCTP association receives per second.
Ordered Chunks Sent	Number of ordered chunks that this SCTP association sends per second.
Ordered Chunks Rec	Number of ordered chunks that this SCTP association receives per second.
Unordered Chunks Sent	Number of unordered chunks that this SCTP association sends per second.

Field	Description
Unordered Chunks Rec	Number of unordered chunks that this SCTP association receives per second.
Retransmitted Chunks	Number of chunks that this SCTP association retransmits per second.
Retransmitted Fast Chunks	Number of fast chunks that this SCTP association retransmits per second.

Statistics: Application Servers

You use the MWTM to view statistics for a chosen application server.

The Statistics Details: Statistics tab contains:

Field	Description
Active Duration	Total time the application server is in service since the last reboot of the ITP, or since ITP last reset the counters.
MTP3 Packet Rate (per sec)	Number of MTP3 packets that the application server receives per second.
	This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates.
ASP Packet Rate (per sec)	Number of application server process packets that the application server sends per second.
	This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates.

Statistics: Application Server Process Associations

You use the MWTM to view statistics for a chosen application server process association.

The Statistics Details: Statistics tab contains:

- Packets Per Second Information, page 8-83
- Error Information, page 8-83
- ASP Initialization Counters, page 8-83
- Signaling Congestion Counters, page 8-84
- Destination Counters, page 8-84

Packets Per Second Information

The Packets Per Second Information section in the Statistics Details: Statistics tab for application server process associations contains:

Field	Description
Packets From ASP	Number of packets that the application server receives per second.
Packets To ASP	Number of packets that the application server sends per second.
Packets From MTP3	Number of packets that the MTP3 layer receives per second.
Packets To MTP3	Number of packets that the MTP3 layer sends per second.

Error Information

The Error Information section in the Statistics Details: Statistics tab for application server process associations contains:

Field	Description
Errors Received	Total number of error (ERR) messages that the application server process association receives.
Errors Sent	Total number of error (ERR) messages that the application server process association sends.

ASP Initialization Counters

The ASP Initialization Counters section in the Statistics Details: Statistics tab for application server process associations contains:

Field	Description
Up Messages Received	Total number of application server process up (ASPUP) messages that the application server process association receives.
Up ACK Messages Sent	Total number of application server process up acknowledgement (UPACK) messages that the application server process association sends.
Down Messages Received	Total number of application server process down (ASPDN) messages that the application server process receives.
Down ACK Messages Sent	Total number of application server process down acknowledgement (DOWNACK) messages that the application server process association sends.
Activation Messages Received	Total number of application server process active messages that the application server process association receives.
Activation ACK Messages Sent	Total number of application server process active acknowledgement messages that the application server process association sends.

Field	Description
Inactive Messages Received	Total number of application server process inactive messages that the application server process association receives.
Inactive ACK Messages Sent	Total number of application server process inactive acknowledgement messages that the application server process association sends.

Signaling Congestion Counters

The Signaling Congestion Counters section in the Statistics Details: Statistics tab for application server process associations contains:

Field	Description
Level 0 Messages Received	Total number of signaling congestion level 0 (SCON0) messages that the application server process receives.
Level 1 Messages Received	Total number of signaling congestion level 1 (SCON1) messages that the application server process receives.
Level 2 Messages Received	Total number of signaling congestion level 2 (SCON2) messages that the application server process receives.
Level 3 Messages Received	Total number of signaling congestion level 3 (SCON3) messages that the application server process receives.
Level 0 Messages Sent	Total number of signaling congestion level 0 (SCON0) messages that the application server process sends.
Level 1 Messages Sent	Total number of signaling congestion level 1 (SCON1) messages that the application server process sends.
Level 2 Messages Sent	Total number of signaling congestion level 2 (SCON2) messages that the application server process sends.
Level 3 Messages Sent	Total number of signaling congestion level 3 (SCON3) messages that the application server process sends.

Destination Counters

The Destination Counters section in the Statistics Details: Statistics tab for application server process associations contains:

Field	Description
Unavailable Messages Received	Total number of destination unavailable (DUNA) messages that the application server process association receives.
Unavailable Messages Sent	Total number of destination unavailable (DUNA) messages that the application server process association sends.
Available Messages Received	Total number of destination available (DAVA) messages that the application server process association receives.
Available Messages Sent	Total number of destination available (DAVA) messages that the application server process association sends.

Field	Description
User Part Unavailable Messages Received	Total number of destination user part unavailable (DUPU) messages that the application server process association receives.
User Part Unavailable Messages Sent	Total number of destination user part unavailable (DUPU) messages that the application server process association sends.
State Audit Messages Received	Total number of destination state audit (DAUD) messages that the application server process association receives.
State Audit Messages Sent	Total number of destination state audit (DAUD) messages that the application server process association sends.

Statistics: Links and Linksets

You use the MWTM to view statistics for a chosen link or linkset.

The Statistics Details: Statistics tab contains:

- Packet Information, page 8-85
- Bit Information or Byte Information, page 8-86
- LSSU Information (Links Only), page 8-86
- Utilization Information, page 8-87
- Service Information, page 8-88

Statistics for links associated with the chosen linkset are visible in the left column, and for links associated with the adjacent linkset in the right column.

Packet Information

The Packet Information section in the Statistics Details: Statistics tab for links and linksets contains:

Field	Description
Sent Per Sec	Number of packets that the link or linkset sends per second.
	This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates.
Received Per Sec	Number of packets that the link or linkset receives per second.
	This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates.
Drops	Total number of packets that have been dropped by the link or linkset.
Transmit Queue Depth (links only)	Number of packets waiting to be sent on by the link.
Transmit Queue High Depth (links only)	Highest level reached by the transmit queue since the last reboot of the ITP, or since ITP last reset the averages as a result of bad data.

Field	Description
Transmit Queue High Reset (links only)	Level at which the link is to reset the transmit queue. If the link is never to reset the transmit queue, this field displays `Never`.
Signal Link Test (links only)	Indicates whether test packets are being sent on the link. Valid values are: • **true (1)**—Test packets are being sent. • **false (2)**—Test packets are not being sent.

Bit Information or Byte Information

The Bit Information section (or Byte Information section, if you unchecked the Show Details in Bits Instead of Bytes check box in the Preferences window) in the Statistics Details: Statistics tab for links and linksets contains these fields:

Field	Description
Sent Per Sec	Number of bits or bytes (as set in the Preferences window) that the link or linkset sends per second. This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates.
Received Per Sec	Number of bits or bytes (as set in the Preferences window) that the link or linkset receives per second. This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates.

LSSU Information (Links Only)

The Links Status Signal Unit (LSSU) section in the Statistics Details: Statistics tab for links contains:

Field	Description
LSSU Packets Sent	Total number of LSSU packets that the link sends.
LSSU Packets Received	Total number of SS7 Message Transfer Part Layer 2 (MTP2) LSSU packets that the link receives.

Utilization Information

The Utilization Information section in the Statistics Details: Statistics tab for links and linksets contains:

Field	Description
Send Plan Capacity	Planned capacity of the link or linkset to send, in bits per second. For a link or linkset of type: • Serial or HSL, available bandwidth for the link/linkset. • SCTPIP (or Mixed for linksets), set on the ITP by using the plan-capacity CS7 link or linkset configuration command. If Send Plan Capacity is not set on the ITP for this link or linkset, this field displays the value **0**. • Other, this field always displays the value **0**.
%	Amount of the link or linkset's send capacity being used, as a percentage or in Erlangs (E) as set in the Preferences window, calculated by using this formula: Send Utilization = (Bits Sent Per Sec)/Planned Capacity
% (continued)	This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates. For a link or linkset of type: • SCTPIP (or Mixed for linksets), if Send Plan Capacity is not set on the ITP for this link, or for one or more of the links associated with this linkset, this field displays the description `Set Plan Capacity on ITP`. • Other, this field always displays the description `Set Plan Capacity on ITP`.
Send Threshold % (links only)	Indicates when to generate the MWTM a cItpSpLinkSentUtilChange for the link, as a percent of its total send capacity. For example, if Send Plan Capacity is 64,000 bits per second, and Send Threshold % is **50**, then the MWTM generates a cItpSpLinkSentUtilChange notification when the link reaches 50% of 64,000, or 32,000 bits per second.
Receive Plan Capacity	Planned capacity of the link or linkset to receive, in bits per second. For a link or linkset of type: • Serial or HSL, available bandwidth for the link. • SCTPIP (or Mixed for linksets), set on the ITP using the plan-capacity CS7 link/linkset configuration command. If Receive Plan Capacity is not set on the ITP for this link or linkset, this field displays the value **0**. • Other, this field always displays the value **0**.

Field	Description
Receive Utilization %	Amount of the link or linksets receive capacity being used, as a percentage or in Erlangs (E) as set in the Preferences window, calculated by using this formula:
	Receive Utilization = (Bits Received Per Sec)/Receive Plan Capacity
	This field initially displays the description `Waiting for second poll`. After two polling cycles, the MWTM populates this field with actual calculated rates. For a link or linkset of type:
	• SCTPIP (or Mixed for linksets), if Receive Plan Capacity is not set on the ITP for this link, or for one or more of the links associated with this linkset, this field displays the description `Set Plan Capacity on ITP`.
	• Other, this field always displays the description `Set Plan Capacity on ITP`.
Receive Threshold % (links only)	Indicates when to generate the MWTM a cItpSpLinkRcvdUtilChange for the link, as a percent of its total receive capacity. For example, if Receive Plan Capacity is 64,000 bits per second, and Receive Threshold % is **50**, then the MWTM generates a cItpSpLinkRcvdUtilChange notification when the link reaches 50% of 64,000, or 32,000 bits per second.

Service Information

The Service Information section in the Statistics Details: Statistics tab for links and linksets contains:

Field	Description
Duration In Service %	Percentage of time the link or linkset is in service since the last reboot of the ITP, or since ITP last reset the counters.
Duration Out Of Service %	Percentage of time the link or linkset is out of service since the last reboot of the ITP, or since ITP last reset the counters.
MTP3 Accounting Enabled (linksets only)	Indicates whether the collection of MTP3 accounting statistics is enabled for the linkset.
	If the linkset is a Virtual linkset, this field displays N/A.
GTT Accounting Enabled (linksets only)	Indicates whether the collection of GTT accounting statistics is enabled for the linkset.
	For Cisco IOS software releases prior to 12.2(4)MB10, this field displays `Unknown`.
	If the linkset is a Virtual linkset, this field displays N/A.

Status Details

You use the MWTM to view status details for a chosen link.

The Statistics Details: Status Details tab contains:

Column	Description
Protocol State Details	Detailed information about the state of the protocol for this link. Possible values are: • **Changeback control (TCBC)**—Changeback control is buffering data on this link. • **Changeover control (TCOC)**—Changeover control is buffering data on this link. • **Link availability control (TLAC)**—Adjacent Signalling point is restarting. • **Link availability control (TLAC)**—Emergency changeover is in progress on this link. • **Link availability control (TLAC)**—Changeback is in progress on this link. • **Link availability control (TLAC)**—Changeover is in progress on this link. • **Link availability control (TLAC)**—The last changeover operation failed on this link. • **Link availability control (TLAC)**—Inhibit command will be retried.
Protocol State Details (continued)	• **Link availability control (TLAC)**—Management request in progress for this link. • **Link availability control (TLAC)**—Signalling point is in the process of a restart. • **Signalling routing control (TSRC)**—Changeover request is complete. • **Signalling routing control (TSRC)**—Adjacent Signalling Point is restarting. • **Link availability control (TLAC)**—Link is inhibited by a local management operation. • **Link availability control (TLAC)**—Link is inhibited by a remote management operation. • **Link availability control (TLAC)**—Link is blocked because of a local processor outage. • **Link availability control (TLAC)**—Link is blocked because of a remote processor outage.

Column	Description
Link Test Results	Indicates the results of the link test. Possible results are: • **No Errors**—The link did not detect any errors. • **Undefined OPC (Origination Point Code)**—A signaling link test message arrived with an undefined OPC. This scenario can occur when a serial link connects incorrectly, or when you configure an SCTP link incorrectly. This scenario differs from Incorrect OPC because the signaling point is unaware of the point code in question. The point code is not defined for any linkset on this ITP. • **Incorrect OPC**—A signaling link test message arrived with an incorrect OPC. This scenario can occur when a serial link connects incorrectly, or when you configure an SCTP link incorrectly. This scenario differs from **Undefined OPC** because the signaling point is aware of the point code in question, and the point code is defined for a linkset on this ITP, but the point code is not correct for the current linkset. • **Undefined SLC (Signaling Link Code)**—A signaling link test message arrived with an undefined SLC. This scenario can occur when a serial link connects incorrectly, or when you configure an SCTP link incorrectly. The link connects to the correct linkset, but the linkset does not have a definition for the SLC in question. • **Incorrect SLC**—A signaling link test message arrived with an incorrect SLC. This scenario can occur when a serial link connects incorrectly, or when you configure an SCTP link incorrectly. The link connects to the correct linkset, but to the wrong link in that linkset. That is, the signaling test receives the test packet on the wrong link.
Link Test Results (continued)	• **Incorrect NI (Network Indicator)**—A signaling link test message arrived with an incorrect NI. This scenario can occur when links connect to the correct linkset and link, but the NIs of the two adjacent point codes are not the same. • **Bad Pattern**—A signaling link test message arrived with an incorrect test pattern. This error occurs because the test pattern is corrupt. This scenario usually indicates a hardware or configuration issue related to the physical format of the data on the links, caused by a variant mismatch or incorrect definitions on the physical link. • **Non Adjacent**—Received a signaling link test message from a nonadjacent node. • **Failed**—Unable to run the test, or no response arrived in the specified interval.

Column	Description
Link Fail Reason	If the link failed the link test, indicates the reason for the failure. Possible reasons are: • **None**—No additional reason available. • **Changeover in progress**—Changeover is in progress. This message diverts traffic away from a failed link. • **Management disconnect request**—An MTP3 sent a request to stop the link. • **Link alignment lost**—Link alignment is lost. A link is in alignment when signal units are received in sequence, and with the proper number of octets. The signal unit must be a total length of eight-bit multiples. If the signal unit is not of eight-bit multiples, or if the signaling information field (SIF) exceeds the 272-octet capacity, the signaling unit is considered to be in error. If excessive errors are encountered on a link, it is considered to be out of alignment. For M2PA links, this state reason is generated when the M2PA alignment timer T1 expires. This could indicate that the remote link is shutdown, or that intermittent IP connectivity problems exist. • **Link connection lost**—Link connection is lost. • **Local Disconnect**—A request to disconnect the link is received, but the link is already disconnected. • **Remote Disconnect**—A remote disconnect request is received. • **Signal unit error rate monitor failure**—The signal unit error rate monitor has failed. • **T1 timeout no FISU received**—A T1 timeout no FISU is received. This timer avoids message mis-sequencing during changeover. • **T2 timeout no SIO received**—A T2 timeout no SIO is received. This timer waits for a changeover acknowledgment.

Column	Description

Link Fail Reason
(continued)
	• **T3 timeout no SIN received**—A T3 timeout no SIN is received. This timer controls diversion-delay to avoid mis-sequencing on changeback.
	
	• **T6 timeout excessive congestion**—A T6 timeout excessive congestion is received. This timer avoids message mis-sequencing on controlled rerouting.
	
	• **T7 timeout excessive acknowledgement delay**—A T7 timeout excessive acknowledgment delay is received. The T7 timer prevents a signaling point from waiting too long for a positive or negative acknowledgment. Usually, an acknowledgment is sent when a signaling point becomes idle and does not have any more traffic to transmit. When congestion occurs at a signaling point, or an extreme amount of traffic is present, the T7 could possibly time out and force retransmission of messages.
	
	• **Link proving failure**—A link proving failure occurred.
	
	• **Abnormal BSN received**—An abnormal Backward Sequence Number (BSN) is received.
	
	• **Abnormal FIB received**—An abnormal Forward Indicator Bit (FIB) is received.
	
	• **Abnormal SIB received**—An abnormal Status Indicator Busy (SIB) is received.
	
	• **Abnormal LSSU received**—An abnormal Link Status Signal Unit (LSSU) is received.
	
	• **Peer not ready**—An MTP3 tried to bring up a link that is still cleaning up after being stopped. In some cases, the MTP3 does not change over after a link failure, so the M2PA or SCTP waits for an event that will not occur. When an MTP3 tries to bring up the link again, the previous control structures must first be cleaned up. If M2PA gets a start request from an MTP3, and the previous structures are still being held, M2PA cleans them up and sends a `PEER NOT READY` to the MTP3 layer. A subsequent request to start the link from the MTP3 layer will then cause the link to come up.
	
	• **Communication lost**—M2PA or SCTP has determined that the remote end signaling point is no longer reachable. Possible reasons include:
	
	  – The maximum number of consecutive retries of a packet is reached.
	
	  – In the absence of data, the MWTM failed to receive heartbeat ACKs in response to heartbeats, for the maximum number of retries.
	
	• **No Listen posted**—An MTP3 tried to start a link, but the local-peer port associated with the link is not available, probably because of a bad configuration.
	
	• **Unable to allocate buffer**—M2PAor SCTP cannot get buffers for sending or receiving packets. Buffer problems can be temporary or permanent. Temporary buffer problems will generally clear with little side effects. Permanent buffer problems can lead to failed linksets or links.

Column	Description
Link Fail Reason (continued)	• **Link card removed**—A link card is removed.
	• **Link card inserted**—A link card is inserted.
	• **False link congestion**—A false link congestion indication is received.
	• **Configuration downloading**—The configuration is downloading.
	• **Locally inhibited**—The link is locally inhibited by operator request.
	• **Locally uninhibited**—An operator request locally uninhibited the link.
	• **Remotely inhibited**—The link is remotely inhibited by operator request.
	• **Remotely uninhibited**—The link is remotely uninhibited by operator request.
	• **Locally blocked**—The link is blocked locally.
	• **Locally unblocked**—The link is unblocked locally.
	• **Remotely blocked**—The link is remotely blocked.
	• **Remotely unblocked**—The link is remotely unblocked.

Viewing ITP MTP3 Errors

The ITP MTP3 Errors table displays all MTP3 error information for the chosen ITP node.

If you have implemented MWTM User-Based Access, this option is available to users with authentication level System Administrator (level 5).

Note   In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

The MTP3 Errors section displays these columns for the chosen node:

Column	Description
Reset Counters	Opens the MWTM Reset Counters dialog box, which you use to change MWTM poller and counter settings. For more information, see Changing Real-Time Poller and Counter Settings, page 5-21.
Poll Counter Mode	Displays the current mode for poll counters, and the date and time that counters were last reset. Possible modes are:
	• **Since Reboot**—Counters display values aggregated since the last reboot of the ITP, or since ITP last reset the counters.
	• **Since Last Poll**—Counters display values aggregated since the last poll.
	• **Since User Reset**—Counters display values aggregated since the last time they were reset by the user.
Poll Interval	Poll interval used to collect data for the table.

Column	Description
Last Poll	Time the last poll was run.
	This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Count	Number of times the indicated MTP3 error type was detected.
Error Description	Description of the MTP3 error type.

Viewing ITP MSU Rates

The ITP MSU Rates table displays all MSU rate information in charts for the chosen ITP node.

Note   In the MWTM client, the real-time icon ![icon] appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

Figure 8-4   MSU Rates Tab
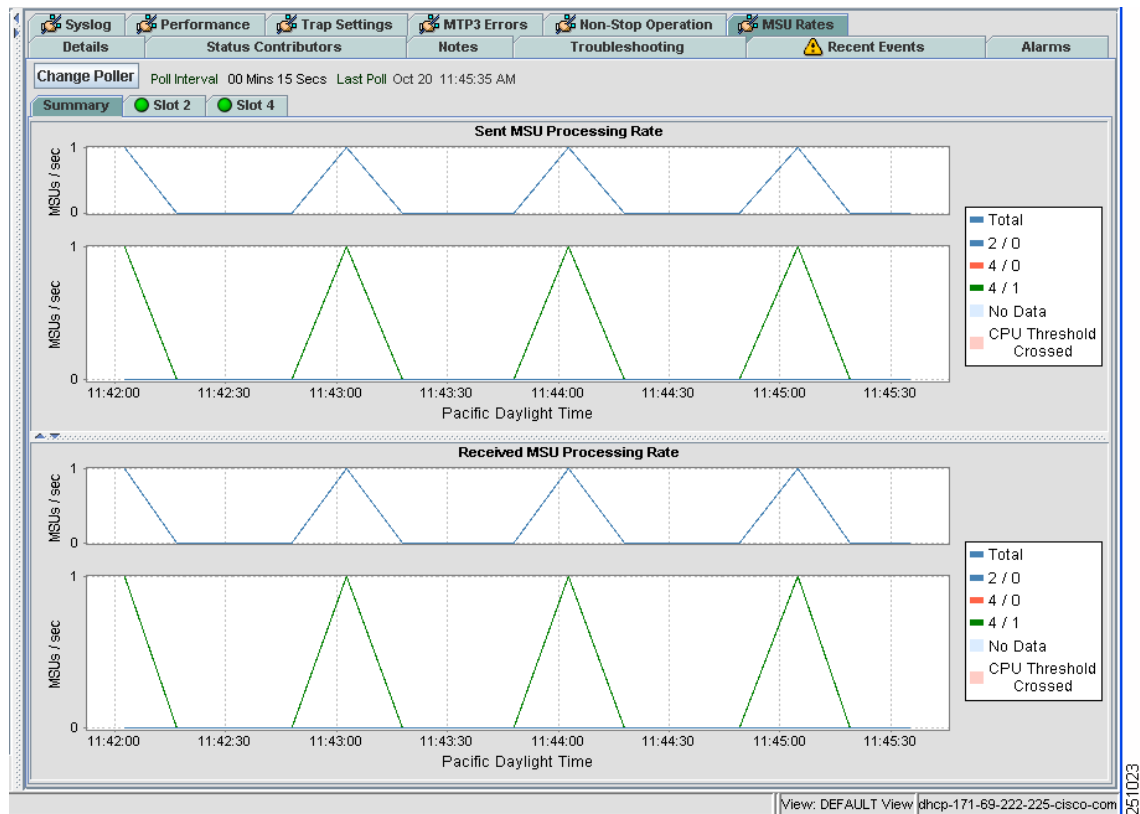
The MSU Rates tab contains a Summary sub-tab, showing totals for all MSU rates. Each additional sub-tab shows MSU rates for a specific CPU (for example, 0/0 shows CPU 0 located in slot 0). The status ball on the sub-tab indicates the current threshold level of the CPU.

GUI Elements	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Poll Interval	Label that shows the current poll interval in seconds.
Last Poll	Time the last poll was run.
	This field initially displays the description Polling node. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
MSUs / sec	Y-axis label that displays traffic rate in MSUs per second.
Time	X-axis label that displays a real-time scale.
Legend	Identifies the data series currently showing in the chart.
	• **No Data**—Data is not available. A vertical bar appears in the chart.
	• **CPU Threshold Crossed**—One or more CPUs have crossed a processing threshold.

Right-click Menu

A right-click context menu provides options to modify how the chart appears:

Menu options	Description
Hide > *field*	Hides the currently shown data series.
Show > *field*	Shows the currently shown data series.
Reset Zoom	If you have zoomed into a specific area of the chart, resets the zoom.
	Note To zoom into a specific area of the chart, use the left mouse button to drag a box around the area.
Grid On	Displays a grid on the chart.
Grid Off	Removes the grid from the chart.
Shapes On	Displays individual data points as shapes on the rate lines and the chart legend.
Shapes Off	Removes shapes from the rate lines and the chart legend.

Viewing ITP Non-Stop Operation

Non-Stop Operation (NSO) is an implementation of redundant data elements and software functionality that enables networks to approach 99.999% availability. The ITP Non-Stop Operation table displays detailed information about all NSO settings associated with the chosen node.

To view the Non-Stop Operation section, in a view in the navigation tree, select an ITP node, then click on the Non-Stop Operation tab in the content area. This tab appears only for Cisco 7500 and Cisco 7600 nodes.

Note   In the MWTM client, the real-time icon ![icon] appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

The Non-Stop Operation table displays these columns for the chosen node:

Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Configuration: Split Mode	Indicates whether redundant units can communicate synchronization messages with each other: • **Enabled**—Communication is not permitted. The active unit does not communicate with the standby unit, and the standby unit progression does not occur. This mode can be useful during maintenance. • **Disabled**—Communication is permitted. The active unit communicates with the standby unit, and the standby unit is reset to recover.
Configuration: Keepalive Threshold	On platforms that support keepalives, this field indicates the number of lost keepalives allowed before a failure occurs. If a failure occurs, a Switch of Activity (SWACT) notification switches the active unit to standby status, and vice versa. On platforms that do not support keepalives, this field has no meaning.
Configuration: Keepalive Threshold Min	Minimum acceptable value for the Keepalive Threshold.
Configuration: Keepalive Threshold Max	Maximum acceptable value for the Keepalive Threshold.
Configuration: Keepalive Timer (msecs)	On platforms that support keepalives, this timer guards against lost keepalives. If the RF subsystem does not receive a keepalive before this timer expires, a SWACT notification switches the active unit to standby status, and vice versa. On platforms that do not support keepalives, this field has no meaning.
Configuration: Keepalive Time Min (msecs)	Minimum acceptable value for the Keepalive Timer.
Configuration: Keepalive Time Max (msecs)	Maximum acceptable value for the Keepalive Timer.

Column	Description
Configuration: Notification Timer (msecs)	RF notification timer. As the standby unit progresses to the Hot Standby state, the active unit sends asynchronous messages to the standby unit, which then sends an acknowledgment back to the active unit. If the active unit: • Receives the acknowledgement before this timer expires, the standby unit progresses normally. • Does not receive a acknowledgement before this timer expires, a SWACT notification switches the active unit to standby status, and vice versa.
Configuration: Notification Timer Min (msecs)	Minimum acceptable value for the Notification Timer.
Configuration: Notification Timer Max (msecs)	Maximum acceptable value for the Notification Timer.
Configuration: RF Notification	Indicates whether RF system notification is enabled or disabled.
Configuration: Maintenance Mode	Indicates whether the redundant system is in maintenance mode: • **Enabled**—The redundant system is in maintenance mode. The active unit does not communicate with the standby unit, and the standby unit progression does not occur. • **Disabled**—The redundant system is in normal operation mode, not maintenance mode. The active unit communicates with the standby unit, and the standby unit is reset to recover.

Column	Description
Configuration: Redundancy Mode	Redundancy mode configured on this system. Possible values are: • **Cold Standby Redundant**—This system is configured for redundancy, but the redundant peer unit is not fully initialized and cannot retain established calls. • **Dynamic Load Share NonRedundant**—This system is not configured for redundancy, but it is load-sharing. The load-sharing is based on the operational load (that is, it is based on the number of calls, or some other factor). • **Static Load Share Redundant**—This system is configured for redundancy, and it is load-sharing. The load-sharing is based on the operational load. • **NonRedundant**—This system is not configured for redundancy, and it is not load-sharing. • **Static Load Share NonRedundant**—This system is not configured for redundancy, but it is load-sharing. The load-sharing is not based on the operational load. • **Static Load Share Redundant**—This system is configured for redundancy, and it is load-sharing. The load-sharing is not based on the operational load. • **Warm Standby Redundant**—This system is configured for redundancy, and the redundant peer unit can immediately handle new calls, but it cannot retain established calls. • **Hot Standby Redundant**—This system is configured for redundancy, the redundant peer unit can immediately handle new calls, and it can *instantaneously* retain established calls.
Configuration: Redundancy Mode Descr	Additional clarification or description of the Redundancy Mode.
Configuration: Oper Redundancy Mode	Operational redundancy mode of this unit. Possible values are: • **Cold Standby Redundant**—This unit is configured for redundancy, but the redundant peer unit is not fully initialized and cannot retain established calls. • **Dynamic Load Share NonRedundant**—This unit is not configured for redundancy, but it is load-sharing. The load-sharing is based on the operational load (that is, it is based on the number of calls, or some other factor).

Column	Description
Configuration: Oper Redundancy Mode (continued)	• **Static Load Share Redundant**—This unit is configured for redundancy, and it is load-sharing. The load-sharing is based on the operational load. • **NonRedundant**—This unit is not configured for redundancy, and it is not load-sharing. • **Static Load Share NonRedundant**—This unit is not configured for redundancy, but it is load-sharing. The load-sharing is not based on the operational load. • **Static Load Share Redundant**—This unit is configured for redundancy, and it is load-sharing. The load-sharing is not based on the operational load. • **Warm Standby Redundant**—This unit is configured for redundancy, and the redundant peer unit can immediately handle new calls, but it cannot retain established calls. • **Hot Standby Redundant**—This unit is configured for redundancy, the redundant peer unit can immediately handle new calls, and it can *instantaneously* retain established calls.
History: Cold Starts	Number of system cold starts, including automatic and manual SWACTs, since the last system initialization.
History: Available Standby Time	Cumulative time that a standby redundant unit is available since the last system initialization.
Current Status: Unit ID	Unique identifier for this redundant unit.
Current Status: Unit State	Current RF status for this unit. Possible values are: • **Active**—Active and is processing calls. • **Active Drain**—Performing client cleanup. • **Active Extra Load**—Active and is processing calls for all feature boards in the system. • **Active Fast**—Performing call maintenance during a SWACT notification. • **Active Handback**—Active, is processing calls, and is handing off some resources to the other RF unit. • **Active Preconfiguration**—Active but has not yet read its configuration. • **Active Postconfiguration**—Active and is processing its configuration.

Column	Description
Current Status: Unit State (continued)	• **Disabled**—RF is not currently operating on this unit. • **Hot Standby**—Ready to become the active unit. • **Initialization**—Establishing necessary system services. • **Negotiation**—Discovering and negotiating with its peer unit. • **Cold Standby**—Running the client RF notification. • **Cold Standby Bulk**—Synchronizing its client data with the peer (active) unit. • **Cold Standby Configuring**—Synchronizing its configuration with the peer (active) unit. • **Cold Standby File System**—Synchronizing its file system with the "V unit". • **Unknown**—The current RF state of this unit is not known.
Current Status: Peer Unit ID	Unique identifier for the peer redundant unit.
Current Status: Peer Unit State	Current RF status for this unit's peer unit. Possible values are: • **Active**—Active and is processing calls. • **Active Drain**—Performing client cleanup. • **Active Extra Load**—Active and is processing calls for all feature boards in the system. • **Active Fast**—Performing call maintenance during a SWACT notification. • **Active Handback**—Active, is processing calls, and is handing off some resources to the other RF unit. • **Active Preconfiguration**—Active but has not yet read its configuration. • **Active Postconfiguration**—Active and is processing its configuration. • **Disabled**—RF is not currently operating on the peer unit. • **Hot Standby**—Ready to become the active unit. • **Initialization**—Establishing necessary system services. • **Negotiation**—Discovering and negotiating with this unit. • **Cold Standby**—Running the client RF notification. • **Cold Standby Bulk**—Synchronizing its client data with this (active) unit. • **Cold Standby Configuring**—Synchronizing its configuration with this (active) unit. • **Cold Standby File System**—Synchronizing its file system with this (active) unit. • **Unknown**—The current RF state of the peer unit is not known.

Column	Description
Current Status: Primary Mode	Indicates whether this unit is the primary or secondary.
	The primary unit has a higher priority than the secondary unit. In a race situation (for example, during initialization), or in any situation in which the units cannot successfully negotiate activity between themselves, the primary unit becomes the active unit and the secondary unit becomes the standby unit. Only one redundant unit can be the primary unit at any given time.
Current Status: Duplex Mode	Indicates whether the peer unit is detected: • **Duplex**—Detected. • **Simplex**—Not detected.
Current Status: Manual Switch Inhibit	Indicates whether a manual Switch of Activity (SWACT) is allowed: • **Enabled**—Not allowed. • **Disabled**—Allowed.
Current Status: Last Switchover Reason	Reason for the last Switch of Activity (SWACT). Possible values are: • **Active Unit Failed**—A failure of the active unit triggered an automatic SWACT. • **Active Unit Removed**—The removal of the active unit triggered an automatic SWACT. • **None**—No SWACT has occurred. • **Unknown**—The reason for the last SWACT is not known. • **Unsupported**—The reason code for the last SWACT is not supported. • **User Forced**—A user forced a manual SWACT, ignoring preconditions, warnings, and safety checks. • **User Initiated**—A user initiated a safe, manual SWACT.
Current Status: Total System Up Time	Date and time when this node was up.
Current Status: Last Failover Time	Date and time when the primary redundant unit became the active unit. If no failover has occurred, this field displays No Failover Has Occurred.
Current Status: Standby Available At Time	Date and time when the peer redundant unit entered the Hot Standby state. If a failover occurs, this fields displays System Initialization for a brief period until the system is back up.

Column	Description
Redundancy Mode Capability: Capability Mode and Description	List of redundancy modes that the unit can support. Possible values are: • **Cold Standby Redundant**—This unit is configured for redundancy, but the redundant peer unit is not fully initialized and cannot retain established calls. • **Dynamic Load Share NonRedundant**—This unit is not configured for redundancy, but it is load-sharing. The load-sharing is based on the operational load (that is, it is based on the number of calls, or some other factor). • **Static Load Share Redundant**—This unit is configured for redundancy, and it is load-sharing. The load-sharing is based on the operational load. • **NonRedundant**—Redundancy is not configured on this unit, and it is not load-sharing. • **Static Load Share NonRedundant**—This unit is not configured for redundancy, but it is load-sharing. The load-sharing is not based on the operational load. • **Static Load Share Redundant**—This unit is configured for redundancy, and it is load-sharing. The load-sharing is not based on the operational load. • **Warm Standby Redundant**—This unit is configured for redundancy, and the redundant peer unit can immediately handle new calls, but it cannot retain established calls. • **Hot Standby Redundant**—This unit is configured for redundancy, the redundant peer unit can immediately handle new calls, and it can *instantaneously* retain established calls. The Description column contains additional clarification or description of the Capability Mode.
Switchover History: Index	Number identifying the entry in the Switchover History table.
Switchover History: Prev. ID	Unit ID of the active unit that failed or was removed.
Switchover History: Curr. ID	Unit ID of the standby unit that became the new active unit.
Switchover History: Reason	Reason for the SWACT. Possible values are: • **Active Unit Failed**—A failure of the active unit triggered an automatic SWACT. • **Active Unit Removed**—The removal of the active unit triggered an automatic SWACT. • **None**—No SWACT has occurred.

Column	Description
Switchover History: Reason (continued)	• **Unknown**—The reason for the last SWACT is not known. • **Unsupported**—The reason code for the last SWACT is not supported. • **User Forced**—A user forced a manual SWACT, ignoring preconditions, warnings, and safety checks. • **User Initiated**—A user initiated a safe, manual SWACT.
Switchover History: Time	Date and time that the SWACT occurred.

Viewing TDM Statistics

You can view real-time TDM statistics for T1 and E1 interfaces. To view TDM statistics for one of these interfaces, launch the MWTM client or MWTM web interface (http://*server name*:1774), select the T1 or E1 interface in the navigation tree (in the Physical folder), then click the TDM Statistics tab.

Note   In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

The TDM Statistics tab contains:

GUI Element	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110. This button appears only in the MWTM client.
Poll Interval	Label that shows the current poll interval in seconds.
Last Poll	Label that identifies when the last poll occurred.
Line Configuration	Pane that lists the line configuration parameters of the chosen T1 or E1 interface. See Line Configuration Pane, page 8-103.
Line Status Information [1]	Pane that provides line status information for the chosen T1 or E1 interface. See Line Status Information Pane, page 8-106.
Performance / Error Information [1]	Pane that provides performance and error information for the chosen T1 or E1 interface. See Performance and Error Information Pane, page 8-106.

1. To run basic troubleshooting commands on T1 and E1 interfaces, click the Troubleshooting tab, and select the Layer 2 Cross Connection category. See Viewing Troubleshooting, page 8-43.

Line Configuration Pane

The Line Configuration pane contains:

Parameter	Value
Interface Name	Name of the interface (for example, T1 0/0).
Line Type	Indicates the type of DS1 line that implements this circuit. The type of circuit affects the number of bits per second that the circuit can reasonably carry, as well as the interpretation of the usage and error statistics. Values include: • ESF—Extended Super Frame DS1. • D4—AT&T D4 format DS1. • E1—CCITT recommendation G.704 (Table 4a). • E1-CRC—CCITT recommendation G.704 (Table 4b). • E1-MF—G.704 (Table 4a) with TS16 multiframing enabled. • E1-CRC-MF—G.704 (Table 4b) with TS16 multiframing enabled. • Other—Line type that is other than those described by this parameter.
Line Code	Indicates the type of zero code suppression used on the line, which affects a number of its characteristics. Values include: • JBZS—Jammed Bit Zero Suppression. A technique in which the AT&T specification of at least one pulse every 8-bit period is literally implemented by forcing a pulse in bit 8 of each channel. Therefore, only seven bits per channel, or 1.344 Mbps, is available for data. • B8ZS—Bipolar with 8 Zeros Substitution. A specified pattern of normal bits and bipolar violations replace a sequence of eight zero bits. • ZBTSI—Zero Byte Time Slot Interchange. A technique applied to a DS1 frame to ensure pulse density requirements are met. ANSI clear channels use ZBTSI. • AMI—Alternate Mark Inversion. A technique in which no zero code suppression is present and the line encoding does not directly solve the problem. In this application, the higher layer must provide data which meets or exceeds the pulse density requirements. E1 links, with or without CRC, use this code or the HDB3 code. • HDB3—High Density Bipolar of order 3. A line code based on AMI. • Other—Line code that is other than those described by this parameter.
Send Code	Indicates what type of code is sent across the DS1 interface by the device. Values include: • Send No Code—Sending looped or normal data. • Send Line Code—Sending a request for a line loopback. • Send Payload Code—Sending a request for a payload loopback. • Send Reset Code—Sending a loopback termination request. • Send QRS—Sending a quasi-random signal (QRS) test pattern. • Send 511 Pattern—Sending a 511 bit fixed test pattern. • Send 3-in-24 Pattern—Sending a fixed test pattern of 3 bits set in 24. • Send Other Test Pattern—Sending a test pattern other than those described by this parameter.

Parameter	Value
Circuit Identifier	Contains the transmission vendor's circuit identifier, for the purpose of facilitating troubleshooting.
Loopback Config	Identifies the loopback configuration of the DS1 interface. Agents supporting read/write access should return badValue in response to a requested loopback state that the interface does not support. Values include: • No Loop—Not in the loopback state. A device that is not capable of performing a loopback on the interface always returns this value. • Payload Loop—The received signal at this interface is looped through the device. Typically the received signal is looped back for retransmission after it has passed through the device's framing function. • Line Loop—The received signal at this interface does not go through the device (minimum penetration) but is looped back out. • Other Loop—Loopbacks that are not defined by this parameter.
Signal Mode	Identifies the signal mode of the interface. Values include: • None—Indicates that no bits are reserved for signaling on this channel. • Robbed Bit—Indicates that T1 robbed bit signaling is in use. • Bit Oriented—Indicates that E1 channel associated signaling is in use. • Message Oriented—Indicates that common channel signaling is in use either on channel 16 of an E1 link or channel 24 of a T1.
Clock Source	Indicates the source of the transmit clock. Values include: • Loop Timing—Indicates that the recovered receive clock is used as the transmit clock. • Local Timing—Indicates that a local clock source is used. • Through Timing—Indicates that a recovered receive clock from another interface is used as the transmit clock.
Facilities Data Link	Describes the use of the facilities data link, and is the sum of the capabilities: • ANSI T1 403—Refers to the facilities data link (FDL) exchange recommended by ANSI. • AT&T 54016—Refers to ESF FDL exchanges. • FDL None—Indicates that the device does not use the FDL. • Other—Indicates use of a protocol other than those described by this parameter.

Line Status Information Pane

The Line Status Information pane contains:

Parameter	Value
Line Status	Indicates the line status of the interface. It contains loopback, failure, received alarm, and transmitted alarm information. Values include: • No Alarm—No alarm is present on the line. • Receive Far End LOF—Far end loss of frame (LOF). This notification is also known as a yellow alarm. • Transmit Far End LOF—Near end is sending LOF indication. • Receive AIS—Far end is sending alarm indication signal (AIS). • Transmit AIS—Near end is sending AIS. • Loss of Frame—Near end LOF (red alarm). • Loss of Signal—Near end loss of signal (LOS). • Loopback State—Near end is looped. • T16 AIS—E1 T16 alarm indication signal. • Receive Far End LOMF—Far end is sending T16 loss of multiframe (LOMF). • Transmit Far End LOMF—Near end is sending T16 LOMF alignment. • Receive Test Code—Near end is detecting a test code. • Other Failure—Any line status not defined by this parameter.
Loss of Frame Count [1]	Real-time count for loss of frame.
Loss of Signal Count [1]	Real-time count for loss of signal.
Remote Alarm Indication Count [1]	Real-time count for remote alarm indication.
Alarm Indication Signal Count [1]	Real-time count for alarm indication signal.

1. Not available for T1 or E1 controllers for ITP 12.2 releases.

Performance and Error Information Pane

The Performance and Error Information pane contains:

Parameter	Value
Time Elapsed within Interval	The number of minutes and seconds that have elapsed since the beginning of the current error-measurement period.
Line Code Violations	The number of line code violations (LCVs) encountered by the interface in the current 15-minute interval.
Path Coding Violations	The number of path coding violations encountered by the interface in one of the previous 96, individual 15-minute, intervals.

Parameter	Value
Slip Duration	The number of slip seconds encountered by the interface in the current 15-minute interval.
Severely Errored Framing Duration	The number of severely errored framing seconds encountered by the interface in the current 15-minute interval.
Line Error Duration	The number of line errored seconds encountered by the interface in the current 15-minute interval.
Degraded Duration	The number of degraded seconds encountered by the interface in the current 15-minute interval.
Errored Duration	The number of errored seconds encountered by the interface in the current 15-minute interval.
Bursty Error Duration	The number of bursty errored seconds encountered by the interface in the current 15-minute interval.
Severely Errored Duration	The number of severely errored seconds encountered by the interface in the current 15-minute interval.
Unavailable Duration	The number of unavailable seconds encountered by a DS1 interface in the current 15 minute interval.

Viewing RAN-O Performance Data

Note   The web interface provides historical (not real-time) charts depicting performance information over user-specified time ranges. You can use historical statistics for capacity planning and trend analysis. See Displaying RAN-O Historical Statistics, page 11-33.

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.

You use real-time charts in the MWTM client to view performance information on shorthaul and backhaul interfaces. To view performance data for a shorthaul or backhaul interface, select the interface in the navigation tree of the DEFAULT view (or any custom view), then click the Backhaul or Shorthaul Performance tab in the right pane.

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 > Web > Administrative**; then click **IPRAN OS README**.

The Backhaul or Shorthaul Performance tab displays one or more charts depending on whether you selected a shorthaul or a backhaul interface. These charts depict send and receive rates of optimized IP traffic over time. The charts display the traffic from 0 to the maximum speed on the interface. You can set the client preferences to display this data in bits or bytes per second. The default polling interval is 15 seconds, but you can change the frequency in the Poller Settings dialog box, which you launch by clicking the Change Poller button.

The Backhaul or Shorthaul Performance tab also shows total send and receive errors when you select a backhaul interface.

This section provides information about:

- Viewing Shorthaul Performance Data, page 8-108
- Viewing Backhaul Performance Data, page 8-111

Viewing Shorthaul Performance Data

Note   In the MWTM client, the real-time icon ![icon] appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

The Shorthaul Performance tab displays a single chart that shows:

- The send rate plotted in one color and the receive rate plotted in a different color (Figure 8-5).
- A vertical band when the congestion mechanism is active (see the *Cisco MWR 1941-DC-A Mobile Wireless Edge Router Software Configuration Guide* for congestion management information).
- A different colored vertical band when no data exists.

Figure 8-5   Shorthaul Performance Tab

Content Pane

The content (right) pane contains:

GUI Elements	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Poll Interval	Label that shows the current poll interval in seconds.
Bits or Bytes/Sec	Y-axis label that displays traffic rate in bits or bytes per second. The default is bits per second. The Y axis automatically scales to the interface speed. To change the charts to show bytes per second, uncheck the Show Details in Bits instead of Bytes check box in the Preferences window (General Display Settings, page 5-4).

GUI Elements	Description
Time	X-axis label that displays a real-time scale and the server time zone.
Legend	Identifies the data series currently showing in the chart. • **No Data**—Data is not available. A vertical bar appears in the chart. • **Congestion Active**—Shows when the shorthaul is in a congested state. A vertical bar appears in the chart. **Note** You can configure the congestion mechanism for low-latency GSM and UMTS traffic. Other traffic (for example, SNMP or file transfer) can be discarded without entering the congestion mechanism. For detailed information about GSM and UMTS congestion management, see the *Cisco MWR 1941-DC-A Mobile Wireless Edge Router Software Configuration Guide*.

Change Poller

To change the poll interval, click the **Change Poller** button. The MWTM displays the Poller Settings dialog box.

The Poller Settings window displays these labels and buttons for the chosen shorthaul or backhaul interface:

Label/Button	Description
Poll Interval (secs)	The poll interval, in seconds, for the chosen node. To set a new poll interval, click in the Poll Interval (secs) text box and enter a new value. The default value is 15 seconds. Valid values are between *5* and *60*.
Current Poll Interval	Value of the poll interval currently in use.
Number of Polls Received	Number of polls received by the chosen node.
Running Time	Time in hours, minutes, and seconds that the poller is running.
Change	Changes the poll interval from the current setting to the value you have entered in the Poll Interval (secs) text box.
Close	Closes the Poller Settings window.
Help	Displays online help for the current window.

Right-click Menu

A right-click context menu provides options to navigate to the backhauls that are associated with the chosen shorthaul interface. You can also modify how the chart appears. The right-click menu contains:

Menu options	Description
Goto > *backhaul*	Opens the Backhaul Performance tab for the backhaul interface associated with the chosen shorthaul interface.
Show/hide right-click menu	Provides options to show or hide one or more parts of a data series. See Right-click Menu, page 8-95, for descriptions of the options.

Viewing Backhaul Performance Data

Note   In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

The Backhaul Performance tab displays multiple charts in a split pane (Figure 8-6). The top pane displays send rate statistics, and the bottom pane displays receive rate statistics. You can maximize either pane to full screen size by using the split-pane control bar.

Each pane contains three charts that share the same time domain:

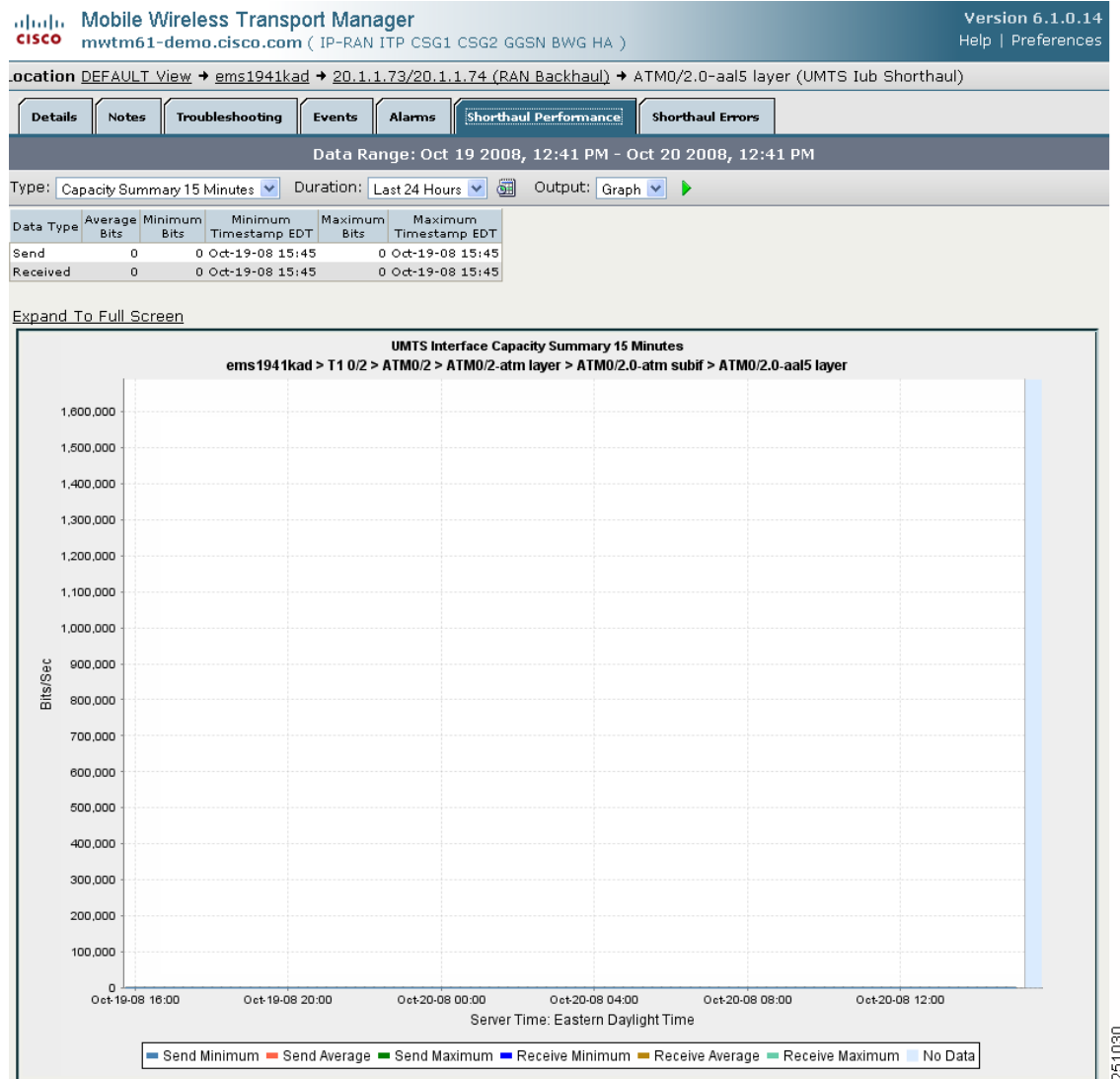- **Top chart**—Displays total GSM traffic, total UMTS traffic, and total traffic (a summation of total GSM and total UMTS) in bits or bytes per second (left Y axis). The right Y axis displays the backhaul utilization as a percentage of the user bandwidth. You can change the scale of the Y axis by changing the User Bandwidth (see Editing Properties for a RAN-O Backhaul, page 6-36). The Y axis automatically scales to the User Bandwidth.

  The top chart overlays the traffic display on top of threshold ranges (acceptable, warning, and overloaded) that are represented by color-coded, horizontal bands.

- **Middle chart**—Displays the traffic rates in bits or bytes per second for each shorthaul interface that is associated with the backhaul interface.

- **Bottom chart**—Displays total send-and-receive errors per second over time for all of the shorthaul interfaces included in the backhaul interface.

Figure 8-6   Backhaul Performance Tab

Content Pane

The content (right) pane contains:

GUI Elements	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Poll Interval	Label that shows the current poll interval in seconds.
SH or BH Bits or Bytes/Sec	Left Y-axis label that displays shorthaul (SH) or backhaul (BH) traffic rate in bits or bytes per second. The default is bits per second. This label appears for only the top and middle charts of both panes. The Y axis automatically scales to the User Bandwidth.

To change the charts to show bytes per second, uncheck the Show Details in Bits instead of Bytes check box in the Preferences window (General Display Settings, page 5-4). |

GUI Elements	Description
% Utilization	Y-axis label on the right side of the chart. The right-side axis displays the backhaul utilization as a percentage of the User Bandwidth. The chart background is color-coded to indicate these thresholds: • **Overloaded**—Top portion of chart background • **Warning**—Middle portion of chart background • **Acceptable**—Bottom portion of chart background For definitions of these thresholds, see Threshold Information (RAN-O Only), page 8-43. To change threshold settings, including the User Bandwidth, see Editing Properties for a RAN-O Backhaul, page 6-36. **Note** If the % Utilization exceeds 100%, see Why does my backhaul utilization graph show greater than 100% for transmit traffic?, page C-22.
Errors/Sec	Y-axis label that displays the total number of errors per second for send and receive traffic. This label appears only for the bottom chart of both panes. **Note** The same Errors/Sec chart appears in each pane.
Time	X-axis label that displays real-time scales for all the charts in the pane. The chart also shows the server time zone.
Split-pane Control	Pane sizing feature that separates the top and bottom panes. To fully expand the: • Bottom pane, click the noninverted triangle on the control bar. • Top pane, click the inverted triangle on the control bar. To partially expand a pane, left-click the control bar and drag it up or down.
Legend	Color-coded legend to the right of the charts that describes the information that appears in all three charts of the pane.

Right-click Menu

A right-click context menu provides options to navigate to the shorthauls that are associated with the chosen backhaul interface. You can also modify how the chart appears.

The right-click menu contains:

Menu options	Description
Goto > *shorthaul*	Opens the Shorthaul Performance tab for the shorthaul interface associated with the chosen backhaul interface.
Display Series...	Opens the Display Series dialog box, which allows you to select data series to show or hide. See Display Series Dialog Box, page 8-113.
Reset Zoom, Grid, Shapes	See Right-click Menu, page 8-95, for descriptions of these options.

Display Series Dialog Box

The Display Series dialog box allows you to select data series to show or hide.

The Display Series dialog box contains:

Column or Button	Description
Display	Column of check boxes that allow you to display (by checking) or hide (by unchecking) the data series associated with the chosen backhaul.
	The MWTM displays no more than 12 series by default. You can change this setting for the MWTM Client Display or the MWTM Web Display:
	MWTM Client Display
	To change the maximum number of data series that the MWTM client interface displays by default, edit the MAX_CHART_SERIES parameter in the client-side *System.properties* file:
	• For the Windows client: *C:\Program Files\Cisco Systems\MWTM Client \properties\System.properties*
	• For Solaris or Linux client: */opt/CSCOsgmClient/System.properties*
	⚠ Caution Depending on the processing power and memory of your client system, setting the MAX_CHART_SERIES parameter too high can cause the client display to become unresponsive. If the client becomes unresponsive, set the MAX_CHART_SERIES to a lower value.
	Remember to restart the client to activate the new MAX_CHART_SERIES value.
	MWTM Web Display
	To change the maximum number of data series that the MWTM web interface displays by default, edit the MAX_CHART_SERIES parameter in the server-side *System.properties* file: */opt/CSCOsgm/properties/System.properties*.
	⚠ Caution Depending on the number of shorthauls that you display, setting the MAX_CHART_SERIES parameter too high can cause the web display to become unresponsive. If the web become unresponsive, set the MAX_CHART_SERIES to a lower value.
	Remember to restart the server to activate the new MAX_CHART_SERIES value
Series Name	Name of the data series to display or hide.
RAN Backhaul	The RAN backhaul that is associated with the data series.
	This column appears only when the chosen backhaul is a virtual backhaul. For more information about virtual backhauls, see Creating Virtual RAN Backhauls, page 8-140.
Close	Closes the Display Series dialog box.
Help	Opens the help system for the Display Series dialog box.

Viewing RAN-O Error Data

> **Note**   The web interface provides historical (not real-time) error information over user-specified time ranges. You can use historical statistics for capacity planning and trend analysis. See Displaying RAN-O Historical Statistics, page 11-33.

The MWTM client interface provides access to RAN-O real-time error 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.

You use real-time charts in the MWTM client to troubleshoot errors that occur on shorthaul and backhaul interfaces. To view error data for a shorthaul or backhaul interface, select it in the navigation tree of the DEFAULT view (or any custom view), and click the Shorthaul or Backhaul Errors tab in the right pane.

The Shorthaul or Backhaul Errors tab shows errors for the chosen interface.

> **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 > Web > Administrative**; then click **IPRAN OS README**.

Viewing Shorthaul Errors

> **Note**   In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

When you select a GSM Abis shorthaul interface in the navigation tree in the DEFAULT view (or any custom view), the MWTM displays protocol, missed packet, and miscellaneous errors in the right pane (Figure 8-7). When you select a UMTS Iub shorthaul interface, the MWTM displays optimization and miscellaneous errors.

This window also includes a graph that displays the total number of errors per second. The graph has a right-click menu with options to similar to those of the right-click menu of the Performance window.

You can use the split pane control bar to resize or maximize the error tables or the error graph.

Figure 8-7   Example of Shorthaul Errors for GSM Abis Interface

Content Pane

The content (right) pane contains:

GUI Elements	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Reset Counters	Opens the Reset Counters dialog box to configure the method of polling. See Changing Real-Time Poller and Counter Settings, page 5-21.
Poller Counter Mode	Label that displays the polling mode that you configure in the Reset Counters dialog box.
Poll Interval	Label that shows the current poll interval in seconds.
Optimization Failures	Pane that displays optimization failures for the chosen GSM Abis or UMTS Iub shorthaul interface. See Protocol Failures, page 8-117.
Miscellaneous	Pane that displays miscellaneous errors on the chosen shorthaul interface. See Miscellaneous, page 8-118.
	Note This pane appears for both GSM Abis and UMTS Iub shorthaul interfaces but with some differences in the types of errors shown.

GUI Elements	Description
Missed Packets	Pane that displays missed packet errors on the chosen GSM Abis shorthaul interface. See Missed Packets, page 8-119. **Note** This pane appears only for GSM Abis shorthaul interfaces.
Split-pane Control Bar	Pane sizing feature that separates the top and bottom panes. To fully expand the: • Bottom pane, click the noninverted triangle on the control bar. • Top pane, click the inverted triangle on the control bar. To partially expand a pane, left-click the control bar and drag it up or down.
Total Errors / Second	Chart that displays the total number of errors per second on the shorthaul interface. See Total Errors per Second, page 8-120.

Protocol Failures

The Protocol Failures pane has a table that contains:

GUI Elements	Description
Columns	Table columns that list: • *Type of error*—Type of protocol failure on the GSM Abis or UMTS Iub • **Counts**—Number of errors of a particular type • **Rates (per sec)**—Error rate for a particular type of error
Total	Total number of protocol failures encountered during the compression and decompression of the GSM-Abis or UMTS-Iub traffic.
Packet Unavailable	The number of times compression failed because a packet was unavailable.
Reconstruction Failures	The number of times information in a packet could not be decompressed.
Encapsulation Errors	The number of times compression failed because of encapsulation errors.
QoS Drops	The number of times compression failed because of quality of service errors or traffic load.
Peer Route Unavailable	The number of times compression failed because a route to the peer was not available.
Interface Down	The number of times compression failed because an interface was down.
Congestion Drops (GSM Abis only)	The number of dropped GSM packets or UMTS cells because of traffic congestion. **Note** You can configure the congestion mechanism for low-latency GSM and UMTS traffic. Other traffic (for example, SNMP or file transfer) can be discarded without entering the congestion mechanism. For detailed information about GSM and UMTS congestion management, see the *Cisco MWR 1941-DC-A Mobile Wireless Edge Router Software Configuration Guide*.

Miscellaneous

The Miscellaneous pane has a table that contains:

Note   The error types in the table apply to UMTS Iub and GSM Abis shorthaul interfaces unless otherwise noted.

GUI Elements	Description
Columns	Table columns that list: • *Type of error*—Type of miscellaneous error on the GSM Abis or UMTS Iub shorthaul. • **Counts**—Number of errors of a particular type. • **Rates (per sec)**—Error rate for a particular type of error.
Total	Total number of miscellaneous failures encountered during the compression and decompression of the GSM-Abis or UMTS-Iub traffic.
Peer Not Ready	The count of packets dropped on the backhaul because the peer was not ready.
Peer Not Active (GSM Abis only)	The count of packets dropped on the backhaul because the peer was reachable but not in an active state.
Invalid Packets	The number of backhaul packets that were received and dropped because they contained invalid information.
Packet Allocation (UMTS Iub only)	The number of times a packet could not be allocated to send data on the UMTS Iub shorthaul interface.
Protocol Encapsulation Errors (UMTS Iub only)	The number of times compression failed because of encapsulation errors.
Local PVC Unavailable (UMTS Iub only)	The number of packets dropped because a local PVC was unavailable.
Remote PVC Unavailable (UMTS Iub only)	The number of packets dropped because a remote PVC was unavailable.
Backhaul Drops (UMTS Iub only)	The number of packets dropped on the backhaul.
Lost Received Packets (GSM Abis only)	The number of backhaul packets expected to be received but that never arrived.
Lost Sent Packets (GSM Abis only)	The number of backhaul packets sent but the peer never received.
Fast Send Failures (GSM Abis only)	The number of fast send failures on the shorthaul interface.
Transmit Failures (GSM Abis only)	The number of packet transmit failures on the shorthaul interface.

GUI Elements	Description
Interrupt Failures (GSM Abis only)	The number of packets lost due to interrupt failures.
Late Arrivals (GSM Abis only)	The number of GSM packets that arrived later than the allowed time.
Early Arrivals (GSM Abis only)	The number of GSM packets that arrived earlier than the allowed time.

Missed Packets

The Missed Packets pane appears only for GSM Abis shorthaul interfaces and has a table that contains:

GUI Elements	Description
Columns	Table columns that list: • *Type of error*—Type of missed packet error on the GSM Abis shorthaul interface. • **Counts**—Number of errors of a particular type. • **Rates (per sec)**—Error rate for a particular type of error.
Total	Total number of missed packet errors encountered during the compression and decompression of the GSM-Abis shorthaul interface.
Late Packets	The number of packets missed on the backhaul because they arrived past the allowed time frame
Lost Packets	The number of packets missed because they were lost on the backhaul
Overruns (GSM Abis only)	The number of packets missed due to the jitter buffer running out of available space.
Transmit Interface Resets (GSM Abis only)	The number of transmission interface resets.
Transmit Buffer Unavailable (GSM Abis only)	The number of times that the system is unable to allocate buffer for transmission.
Reset Event	The number of packets missed on the backhaul because of a reset event
Insufficient Memory	The number of packets missed on the backhaul for lack of available memory to allocate the packet

Total Errors per Second

The Total Errors per Second pane displays a chart that contains:

GUI Elements	Description
Total Errors/Second (shorthaul)	Chart title that lists the chosen shorthaul.
Errors/Sec	Y-axis label that displays errors per second for the chosen shorthaul.
Time	X-axis label that displays a real-time scale for the chosen shorthaul. The chart also displays the server time zone.

A right-click menu provides navigational and chart control options. See Right-click Menu, page 8-110.

Viewing Backhaul Errors

Note   In the MWTM client, the real-time icon appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

When you select a backhaul interface in the navigation tree, the MWTM displays a chart in the right pane (Figure 8-8). The charts shows GSM and UMTS errors per second for each shorthaul interface included in the backhaul.

The content (right) pane contains:

GUI Elements	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Poll Interval	Label that shows the current poll interval in seconds.
Last Poll	Label that displays the date and time of the last poll.
GSM and UMTS Errors/Second	Chart title for GSM and UMTS errors.
Errors/Sec	Y-axis label that displays errors per second.
Time	X-axis label that displays a real-time scale and the server time zone.
Legend	Color-coded legend for the shorthaul interfaces included in the chosen backhaul.

A right-click menu provides navigational and chart control options. See Right-click Menu, page 8-113.

Figure 8-8   Example of Backhaul Errors Chart
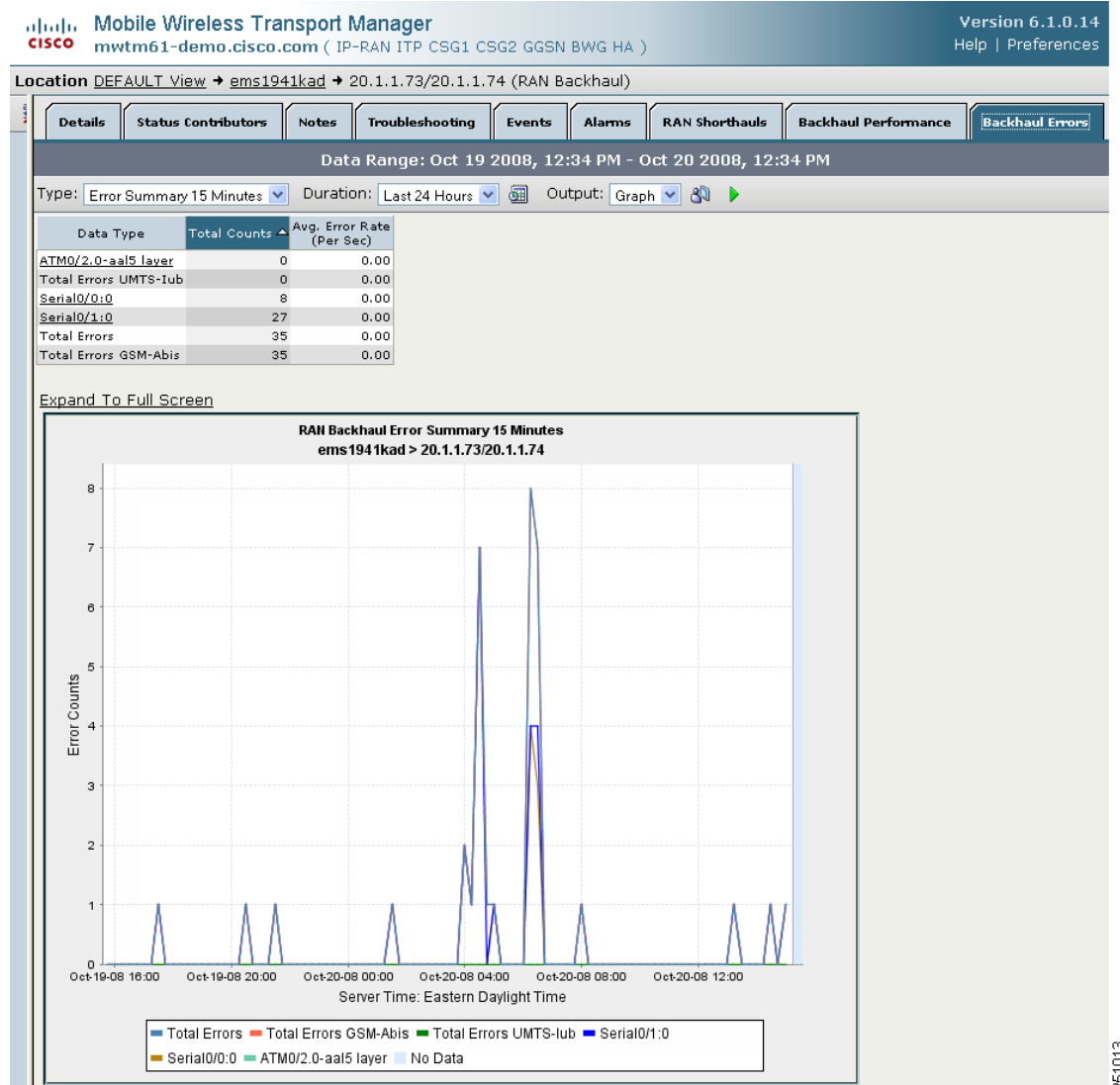
Viewing PWE3 Statistics

You can view real-time Pseudowire Emulation Edge-to-Edge (PWE3) statistics for cell-site routers that have the PWE3 capability. To view real-time PWE3 statistics for one of these nodes, select the node in the navigation tree, then click the PWE3 Statistics tab. You can view real-time PWE3 statistics in the MWTM client and web interfaces (there are minor differences in layout and appearance).

Note   In the MWTM client, the real-time icon ![icon] appears in the tab. This icon indicates that polling will periodically occur while this window is open. To prevent unnecessary traffic on your network, close this window (for example, by clicking a different tab) when you no longer need to view the real-time data.

The PWE3 Statistics tab contains:

| GUI Element	Description
Change Poller	Button that opens the Poller Settings dialog box. See Change Poller, page 8-110.
Reset Counters	Button that opens the Reset Counters dialog box to configure the method of polling. See Changing Real-Time Poller and Counter Settings, page 5-21.
Poller Counter Mode	Label that displays the polling mode that you configure in the Reset Counters dialog box.
Poll Interval	Label that shows the current poll interval in seconds.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
ID	Table column label that lists the ID of the virtual circuit.
Type	Type of service that carries the virtual circuit.
PSN Type	Type of packet-switched network (PSN) that carries the virtual circuit. For example, MPLS.
Name	Name of the virtual circuit.
Description	Description of the virtual circuit.
Peer Address	IP address of the peer node.
Create Time[1]	Time when the virtual circuit was created.
Up Time[1]	Length of time the virtual circuit has been operational.
Admin Status[1]	The administrative status of the virtual circuit.
Oper Status[1]	The operational status of the virtual circuit.
Inbound Oper Status[1]	The operational status of the virtual circuit in the inbound direction.
Outbound Oper Status[1]	The operational status of the virtual circuit in the outbound direction.
Time Elapsed[1]	Time in seconds since the beginning of the measurement period.
Valid Intervals[1]	Number of valid intervals for which data was collected.
Packets Received Rate	Number of packets that the virtual circuit received each second from the packet-switched network.
Packets Received Count[1]	Total number of packets that the virtual circuit received from the packet-switched network.
Bytes Received Rate	Number of bytes that the virtual circuit received each second from the packet-switched network.
Bytes Received Count[1]	Total number of bytes that the virtual circuit received from the packet-switched network.
Packets Sent Rate	Number of packets that the virtual circuit forwarded each second to the packet-switched network.
Packet Sent Count[1]	Total number of packets that the virtual circuit forwarded to the packet-switched network.

GUI Element	Description
Bytes Sent Rate	Number of bytes that the virtual circuit forwarded each second to the packet-switched network.
Bytes Sent Count[1]	Total number of bytes that the virtual circuit forwarded to the packet-switched network.

1. This column is hidden from view by default. To unhide the column, right-click in the column heading area and select the column label.

Viewing ITP Linkset Access Lists

The Linkset Access Lists section displays information about the access lists associated with the chosen linkset and its adjacent linkset.

To view the Linkset Access List section, in a view in the navigation tree, select an ITP linkset, then click on the Linkset Access Lists tab in the content area.

Note   This window polls your network periodically. To prevent unnecessary traffic on your network, close this window when you no longer need it.

This window is not available if the linkset is a Virtual linkset.

For each linkset, the Linkset Access Lists section displays these columns:

Column	Description
Poll Interval	Used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Linkset	Name of the linkset for which access lists appear.
In	Inbound access lists for the linkset. If the linkset has no inbound access lists, this field displays `None`.
Out	Outbound access lists for the linkset. If the linkset has no outbound access lists, this field displays `None`.
List #	Access list number configured on the node and applied to the linkset. ITP uses access list numbers 2700 through 2799.
Access List	List of commands in the access list.

Viewing Data Specific for ITP Signaling Points

These sections are specific only to ITP signaling points:

- Viewing Route Detail, page 8-124
- Viewing GTT MAP Status, page 8-125
- Viewing GTT Statistics, page 8-126

- Viewing the MTP3 Event Log, page 8-129
- Viewing MLR Details, page 8-130

Viewing Route Detail

The Route Detail table displays detailed information about routes associated with the chosen signaling point, including dynamic and shadow routes. The Route Detail table automatically eliminates duplicate data in successive rows.

To view the Route Detail section, in a view in the navigation tree, select an ITP signaling point, then click on the Route Detail tab in the content area.

Note This window polls your network periodically. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

The Route Detail table displays these columns for the chosen signaling point:

Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run.
	This field initially displays the description Polling node. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Destination Point Code	Destination point code for packets on the chosen signaling point. The destination point code is the point code to which a given packet is routed.
Mask	Mask length for packets on the chosen signaling point. The mask length is the number of significant leading bits in the point code. The mask length is always 14 for ITU and 24 for ANSI.
Access	Status of the destination. Possible values are: • Accessible • Inaccessible • Restricted • Unknown
Congestion Level	Indicates the level of congestion on the route. A route is congested if it has too many packets waiting to be sent. This condition could be caused by the failure of an element in your network. Possible values for the Congestion Level field are *None*, indicating no congestion, and **1** to **7**, indicating levels of congestion from very light (**1**) to very heavy (**7**).
Number of Routes	Number of routes to the chosen destination route set (Destination Point Code plus Mask).
Cost	Cost of the route to the destination, relative to other routes. The valid costs range from **1** (lowest cost and highest priority) through **9** (highest cost and lowest priority).

Column	Description
Destination Linkset	Destination linkset associated with the destination point code. The destination linkset is also called the output linkset.
QoS	Quality of service (QoS) class of the route, as configured by the network administrator. Valid QoS classes range from **1** through **7**; ALL indicates that the route accepts all QoS classes.
Management Status	Accessibility of the destination from the adjacent point code at the remote end of the signaling point. Possible values are: • **Allowed**—Traffic is allowed on the route without restriction. • **Prohibited**—Traffic is prohibited on the route. • **Restricted**—Traffic is restricted on the route. • **Unknown**—Accessibility cannot be determined.
Route Status	Status of the route. Possible values are: • Available • Restricted • Unavailable

Viewing GTT MAP Status

The GTT MAP Status table displays detailed information about all GTT MAPs associated with the chosen signaling point. The GTT MAP Detail table automatically eliminates duplicate data in successive rows.

To view the GTT MAP Status section, in a view in the navigation tree, select an ITP signaling point, then click on the GTT MAP Status tab in the content area.

Note This window polls your network periodically. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

The GTT MAP Status table displays these columns for the chosen signaling point:

Column	Description
Reset Counters	Opens the MWTM Reset Counters dialog box, which you use to change MWTM poller and counter settings. For more information, see Changing Real-Time Poller and Counter Settings, page 5-21.
Poll Counter Mode	Displays the current mode for poll counters, and the date and time that counters were last reset. Possible modes are: • **Since Reboot**—Counters display values aggregated since the last reboot of the ITP, or since ITP last reset the counters. • **Since Last Poll**—Counters display values aggregated since the last poll. • **Since User Reset**—Counters display values aggregated since the last time they were reset by the user.
Poll Interval	Poll interval used to collect data for the table.

Column	Description
Last Poll	Time the last poll was run.
	This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Point Code	Primary point code for the GTT MAP.
Point Code Status	Status of the primary point code. Possible values are:
	• Allowed
	• **Prohibited**—Either the point code cannot be reached, or the point code is labeled Prohibited by the SCCP protocol.
Congestion Level	MTP3 congestion level for the primary point code. Possible values are:
	• **No congestion**—Corresponds to None. The link is not congested.
	• **Congestion level 1**—Corresponds to Low. The link is slightly congested.
	• **Congestion level 2**—Corresponds to High. The link is congested.
	• **Congestion level 3**—Corresponds to Very High. The link is very congested.
	Low, High, and Very High correspond roughly to equivalent ANSI, China standard, ITU, NTT, and TTC congestion levels.
Point Code Congested	Number of times a point code was congested at the GTT MAP.
Point Code Unavailable	Number of times a point code was unavailable at the GTT MAP.
SCCP Unavailable	Number of times an SCCP was unavailable at the GTT MAP.
MTP3 Failures	Number of times the MTP3 layer failed at the GTT MAP.
Number of Subsystems	Number of subsystems for the GTT MAP.
Subsystem Number	Primary subsystem number (SSN) for the GTT MAP.
Subsystem Status	Status of the primary SSN. Possible values are:
	• Allowed
	• Prohibited—Either the remote subsystem cannot be reached, or the SCCP protocol labels the subsystem Prohibited.
Subsystem Unavailable	Number of times a subsystem was unavailable at the GTT MAP.
Subsystem Congested	Number of times a subsystem was congested at the GTT MAP.

Viewing GTT Statistics

The GTT Statistics table displays detailed statistical information about all GTTs that are associated with the chosen signaling point. The GTT Statistics table automatically eliminates duplicate data in successive rows.

To view the GTT Statistics section, in a view in the navigation tree, select an ITP signaling point, then click on the GTT Statistics tab in the content area.

> **Note** This window polls your network periodically. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

The GTT Statistics table displays these columns for the chosen signaling point:

Column	Description
Reset Counters	Opens the MWTM Reset Counters dialog box, which you use to change MWTM poller and counter settings. For more information, see Changing Real-Time Poller and Counter Settings, page 5-21.
Poll Counter Mode	Displays the current mode for poll counters, and the date and time that counters were last reset. Possible modes are: • **Since Reboot**—Counters display values aggregated since the last reboot of the ITP, or since ITP last reset the counters. • **Since Last Poll**—Counters display values aggregated since the last poll. • **Since User Reset**—Counters display values aggregated since the last time they were reset by the user.
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Uptime	Time the node is up, in days, hours, minutes, and seconds.
Selector Entries	Number of entries in the GTT Selector Table.
GTA Entries	Number of entries in the GTT GTA Table.
Application Group Entries	Number of entries in the GTT App Group Table.
Addr. Conversion Entries	Number of entries in the GTT Address Conversion Table.
Point Code List Entries	Number of entries in the GTT CPC List.
GTT Errors: Errors To MTP	Number of Error messages (ERRs) sent by GTT to the MTP.
GTT Errors: Errors From MTP	Number of Error messages (ERRs) received by GTT from the MTP.
GTT Errors: Translation Error	Number of times translation was requested for a combination of Translation Type, Numbering Plan, and Nature of Address for which no translation exists in the signaling point. Occurs when no selector is available for the combination of parameters provided in the MSU.
GTT Errors: Unequipped Subsystem Error	Number of times GTT could not perform a translation due to an unequipped subsystem.
GTT Errors: Q752 Unqualified Error	Number of times GTT could not perform a translation due to an error type not covered by the other, more specific error types.
GTT Errors: Invalid GTT Format	Number of times GTT detected an invalid global title format while performing translation.
GTT Errors: Hop Count Error	Number of times GTT detected a hop count violation in the MSU.

Column	Description
GTT Errors: MAP Not Found	Number of times a GTT to a point code or subsystem number was successful, but the point code or subsystem number was not found in the GTT MAP table.
GTT Errors: Counts	Number of GTT errors of the specified type since MWTM polling began for the linkset, or since the MWTM last reset the averages as a result of bad data.
GTT Errors: Rate (per sec)	Number of errors that GTT detected per second.
GTT Messages: Total Messages	Number of messages that GTT handled from local and remote subsystems.
GTT Messages: Local Messages	Number of messages that GTT handled from local subsystems only.
GTT Messages: Total GTT Messages	Number of messages that GTT handled that require translation.
GTT Messages: UDT Messages Sent	Number of unitdata messages (UDTs) that GTT sent.
GTT Messages: UDT Messages Received	Number of unitdata messages (UDTs) that GTT received.
GTT Messages: UDTS Messages Attempted	Number of unitdata service messages (UDTSs) GTT attempted to send.
GTT Messages: UDTS Messages Sent	Number of unitdata service messages (UDTSs) that GTT sent.
GTT Messages: UDTS Messages Received	Number of unitdata service messages (UDTSs) that GTT received.
GTT Messages: XUDT Messages Sent	Number of extended unitdata messages (XUDTs) GTT sent.
GTT Messages: XUDT Messages Received	Number of extended unitdata messages (XUDTs) that GTT received.
GTT Messages: XUDTS Messages Attempted	Number of extended unitdata service messages (XUDTSs) GTT attempted to send.
GTT Messages: XUDTS Messages Sent	Number of extended unitdata service messages (XUDTSs) that GTT sent.
GTT Messages: XUDTS Messages Received	Number of extended unitdata service messages (XUDTSs) that GTT received.
GTT Messages: LUDT Messages Sent	Number of long unitdata messages (LUDTs) that GTT sent.
GTT Messages: LUDT Messages Received	Number of long unitdata messages (LUDTs) that GTT received.
GTT Messages: LUDTS Messages Sent	Number of long unitdata service messages (LUDTSs) that GTT sent.
GTT Messages: LUDTS Messages Received	Number of long unitdata service messages (LUDTSs) that GTT received.
GTT Messages: CR Sent To MTP	Number of Connection Request (CR) message that GTT sent to the MTP. This count includes ISDN-UP messages with embedded CRs.

Column	Description
GTT Messages: CR Received From MTP	Number of Connection Request (CR) message that GTT received from the MTP.
GTT Messages: CREF Sent To MTP	Number of Connection Refusal (CREF) messages that GTT sent to the MTP. This count includes ISDN-UP messages with embedded CRs.
GTT Messages: CREF Received From MTP	Number of Connection Refusal (CREF) messages that GTT received from the MTP.
GTT Messages: RSR Sent To MTP	Number of Reset Request (RSR) messages that GTT sent to the MTP.
GTT Messages: RSR Received From MTP	Number of Reset Request (RSR) messages that GTT received from the MTP.
GTT Messages: Counts	Number of GTT messages of the specified category since MWTM polling began for the linkset, or since the MWTM last reset the averages as a result of bad data.
GTT Messages: Rate (per sec)	Number of errors messages handled by GTT, per second.

Viewing the MTP3 Event Log

The MTP3 Event Log table displays the most recent MTP3 events associated with the chosen signaling point.

To view the MTP3 Event Log section, in a view in the navigation tree, select an ITP signaling point, then click on the MTP3 Event Log tab in the content area.

Note This window polls your network periodically. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

The MTP3 Event Log table displays these columns for the chosen signaling point:

Column	Description
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
Logged Events	Total number of MTP3 events that have been logged for this signaling point.
Dropped Events	Total number of MTP3 events that have been dropped for this signaling point.
Max Events	Maximum number of events that the event history can contain. When event history table is full, the oldest entries are deleted as new entries are added.
Allowed Events	ITP parameter that specifies the absolute maximum for the Max Events field. That is, for this node, the Max Events field can range from 0 to the value specified by the Allowed Events field.
Index	Event number that the ITP assigns.
Message	Message text for the event.

Viewing MLR Details

The MLR Details tab displays the MLR counters, trigger configuration, and trigger results associated with the chosen signaling point.

To view the MLR Details section, in a view in the navigation tree, select an ITP signaling point, then click on the MLR Details tab in the content area.

Note   This window polls your network periodically. To prevent unnecessary traffic on your network, close this window when you no longer need to refer to it.

The MLR Details tab displays these columns for the chosen signaling point:

Column	Description
Reset Counters	Opens the MWTM Reset Counters dialog box, which you use to change MWTM poller and counter settings. For more information, see Changing Real-Time Poller and Counter Settings, page 5-21.
Poll Counter Mode	Displays the current mode for poll counters, and the date and time that counters were last reset. Possible modes are: • **Since Reboot**—Counters display values aggregated since the last reboot of the ITP, or since ITP last reset the counters. • **Since Last Poll**—Counters display values aggregated since the last poll. • **Since User Reset**—Counters display values aggregated since the last time the user reset them.
Poll Interval	Poll interval used to collect data for the table.
Last Poll	Time the last poll was run. This field initially displays the description `Polling node`. After the first polling cycle, the MWTM populates this field with the actual time of the last poll.
MLR Counters	Displays the MLR Counters table. For more information, see Viewing MLR Counters, page 8-130.
MLR Trigger Config	Displays the MLR Trigger Configuration table. For more information, see Viewing MLR Trigger Config, page 8-132.
MLR Trigger Results	Displays the MLR Trigger Results table. For more information, see Viewing MLR Trigger Results, page 8-136.

Viewing MLR Counters

The MLR Counters table displays MLR counters associated with the chosen signaling point.

You can resize each column, or sort tables based on the information in one of the columns. By default, the MWTM displays all of the columns in the MLR Counters table.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The MLR Counters table displays these columns for the chosen signaling point:

Column	Description
Processed: Routed	Total number of packets routed by MLR, and the packet routing rate in packets per second.
Processed: MAP SMS-MO	Number of MSUs of type GSM-MAP SMS-MO processed by MLR, and the GSM-MAP SMS-MO MSU processing rate in packets per second.
Processed: MAP SMS-MT	Number of MSUs of type GSM-MAP SMS-MT processed by MLR, and the GSM-MAP SMS-MT MSU processing rate in packets per second.
Processed: MAP SRI-SM	Number of MSUs of type GSM-MAP SRI-SM processed by MLR, and the GSM-MAP SRI-SM MSU processing rate in packets per second.
Processed: MAP AlertSc	Number of MSUs of type GSM-MAP AlertSc processed by MLR, and the GSM-MAP AlertSc MSU processing rate in packets per second.
Processed: ANSI-41 SMD-PP	Number of MSUs of type ANSI-41 SMD-PP processed by MLR, and the ANSI-41 SMD-PP MSU processing rate in packets per second.
Processed: ANSI-41 SMS Requests	Number of MSUs of type ANSI-41 SMSRequest processed by MLR, and the ANSI-41 SMSRequest MSU processing rate in packets per second.
Processed: ANSI-41 SMS Notifys	Number of MSUs of type ANSI-41 SMSNotify processed by MLR, and the ANSI-41 SMSNotify MSU processing rate in packets per second.
Aborts: Total Aborted	Total number of MSUs aborted by MLR, and the MSU abort rate in packets per second.
Aborts: No Resources	Number of MSUs aborted by MLR because of a shortage of resources, and the No Resources MSU abort rate in packets per second.
Aborts: Results Blocked	Number of MSUs aborted by MLR with a result of block, and the Results Blocked MSU abort rate in packets per second.
Aborts: GTI Mismatches	Number of MSUs aborted by MLR because of mismatched GTIs, and the GTI Mismatches MSU abort rate in packets per second.
Aborts: Address Conversion Failures	Number of MSUs aborted by MLR because of a failed GTA address conversion, and the Address Conversion Failures MSU abort rate in packets per second.
Aborts: Destination Unavailables	Number of MSUs aborted by MLR because the destination was unavailable, and the Destination Unavailables MSU abort rate in packets per second.
Aborts: No Server Aborteds	Number of MSUs aborted by MLR because no server was available, and the No Server Aborteds MSU abort rate in packets per second.
Continues: Total Continued	Total number of MSUs returned to SCCP by MLR with a result of `continue`, and the MSU return rate in packets per second.
Continues: Failed Triggers	Number of MSUs returned to SCCP by MLR because of no trigger match, and the Failed Triggers MSU return rate in packets per second.
Continues: Result Continueds	Number of MSUs returned to SCCP by MLR with a result of `continue`, and the Result Continueds MSU return rate in packets per second.
Continues: Result GTTs	Number of MSUs returned to SCCP by MLR with a result of GTT, and the Result GTTs MSU return rate in packets per second.

Column	Description
Continues: Unsupported SCCP Msg Types	Number of MSUs returned to SCCP by MLR because of unsupported message types, and the Unsupported SCCP Msg Types MSU return rate in packets per second.
Continues: Unsupported Segmented SCCP Msgs	Number of MSUs returned to SCCP by MLR because of unsupported segments, and the Unsupported Segmented SCCP Msg MSU return rate in packets per second.
Continues: Unsupported Messages	Number of MSUs returned to SCCP by MLR because of parse failures, and the Unsupported Messages MSU return rate in packets per second.
Continues: Parse Errors	Number of MSUs returned to SCCP by MLR because of parse errors, and the Parse Errors MSU return rate in packets per second.
Continues: No Results	Number of MSUs returned to SCCP by MLR with no results, and the No Results MSU return rate in packets per second.
Continues: No Server Continueds	Number of MSUs returned to SCCP by MLR because no server was available, and the No Server Continueds MSU return rate in packets per second.

Viewing MLR Trigger Config

The MLR Trigger Config table displays the MLR trigger configuration associated with the chosen signaling point, divided into these subtables:

Triggers

The Triggers subtable displays MLR trigger information associated with the chosen signaling point.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Triggers subtable except Set Name, Start Date, End Date, and Status.

For detailed information on working in tables, see .

The Triggers subtable displays these columns for the chosen signaling point:

Column	Description
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the trigger.
Index	Index number associated with the trigger.
SubTriggers	Number of subtriggers associated with the chosen trigger.

Column	Description
Start Date	Date and time on which this trigger should begin filtering traffic. If no Start Date is configured, this field displays N/A.
End Date	Date and time on which this trigger should stop filtering traffic. If no End Date is configured, this field displays N/A.
Status	Current status of the trigger. Possible values are: • **Active**—A corresponding GTT table entry for the trigger or, if this is an MTP3 trigger, an available route to the appropriate point code exists. • **Inactive**—No corresponding GTT table entry or available route to the appropriate point code for the trigger. The trigger will never match and a configuration error is likely.
Action	Action taken by the trigger.
Prematches	Preliminary count of trigger matches.
Prematch Rate	Number of Prematches per second for the trigger.
Matches	Number of trigger matches with result `Action Performed`.
Match Rate	Number of Matches per second for the trigger.
Parameters	Parameters that control the behavior of the trigger.

SubTriggers

The SubTriggers subtable displays MLR subtrigger information associated with the chosen signaling point and trigger.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the SubTriggers subtable.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The SubTriggers subtable displays these columns for the chosen signaling point:

Column	Description
Trigger (in subtable heading)	Set name of the parent trigger with which the chosen subtrigger is associated.
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the subtrigger.
Index	Index number associated with the subtrigger.
Action	Action taken by the subtrigger.
Matches	Number of subtrigger matches with result `Action Performed`.
Match Rate	Number of Matches per second for the subtrigger.
Parameters	Parameters that control the behavior of the subtrigger.

Ruleset

The Ruleset subtable displays MLR ruleset information associated with the chosen signaling point and trigger or subtrigger.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Ruleset subtable except Start Date and End Date.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Ruleset subtable displays these columns for the chosen signaling point:

Column	Description
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the ruleset.
Start Date	Starting date and time for this ruleset to become active.
End Date	Ending date and time for this ruleset to become active.
Segmented	Indicates whether this ruleset should process segmented messages.
Protocol	Default protocol for rules in this ruleset.
Search Type	Search type that this ruleset should perform.

Rules

The Rules subtable displays MLR rules information associated with the chosen signaling point and ruleset.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Rules subtable except Set Name.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Rules subtable displays these columns for the chosen signaling point:

Column	Description
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the rule.
Index	Index number associated with the rule.
Operation Type	Types of messages on which this rule matches.
Protocol	Protocol used for matching by this rule.
Matches	Number of rule matches with result `Action Performed`.
Match Rate	Number of Matches per second for the rule.
Rule Parameters	Parameters that control the behavior of the rule.
Result Parameters	Parameters that control the behavior of the result associated with this rule.

Addresses

The Addresses subtable displays MLR address information associated with the chosen signaling point and rule.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Addresses subtable except Set Name.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Addresses subtable displays these columns for the chosen signaling point:

Column	Description
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the address.
Address Type	Type of address. The MWTM 6.1 supports these types of addresses: • **bch**—Binary-coded hexadecimal • **gsmDa**—Groupe Special Mobile (GSM) 7-bit default alphabet
Address Digits	Address digits to be matched.
Exact Match	Indicates whether an exact match to the Address Digits is required.
Matches	Number of address matches with result `Action Performed`.
Match Rate	Number of Matches per second for the address.
Result Parameters	Parameters that control the behavior of the result associated with this address.

Results

The Results subtable displays MLR results information associated with the chosen signaling point and rule or address.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Results subtable except Index.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Results subtable displays these columns for the chosen signaling point:

Column	Description
Ruleset (in subtable heading)	Ruleset associated with the results.
No Server Available Action (in subtable heading)	Default behavior if no result is available. Possible actions are: • **Discard**—Discard the packet without forwarding it. • **Resume**—Return the unmodified packet to the higher level protocols for default routing.
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the results.

Column	Description
Index	Index number associated with the results.
Type	Type of result. Possible values are: • **PC**—Point code • **ASName**—Application server name
Result	Destination point code or name of the result.
Weight	Weight for this result in its set of results.
Count	Number of times this result is encountered.
Count Rate	Number of times per second this result is encountered.

Viewing MLR Trigger Results

The MLR Trigger Results table displays the MLR results associated with the chosen signaling point. You can use this subtable to determine which triggers, subtriggers, rules, and addresses are causing a particular result to execute.

The MLR Trigger Results table contains:

Results

The Results subtable displays all MLR results information associated with the chosen signaling point.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Results subtable except Index.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Results subtable displays these columns for the chosen signaling point:

Column	Description
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the results.
Index	Index number associated with the results.
Type	Type of result. Possible values are: • **PC**—Point code • **ASName**—Application server name
Result	Destination point code or name of the result.
Weight	Weight for this result in its set of results.

Column	Description
Count	Number of times this result is encountered.
Count Rate	Number of times per second this result is encountered.

Addresses

The Addresses subtable displays MLR address information associated with the chosen result.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Addresses subtable except Set Name.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Addresses subtable displays these columns for the chosen signaling point:

Column	Description
ResultSet (in subtable heading)	Set of results associated with the addresses.
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the address.
Address Type	Type of address. The MWTM 6.1 supports these types of addresses: • **bch**—Binary-coded hexadecimal • **gsmDa**—Groupe Special Mobile (GSM) 7-bit default alphabet
Address Digits	Address digits to be matched.
Exact Match	Indicates whether an exact match to the Address Digits is required.
Matches	Number of address matches with result `Action Performed`.
Match Rate	Number of Matches per second for the address.
Result Parameters	Parameters that control the behavior of the result associated with this address.

Rules

The Rules subtable displays MLR rules information associated with the chosen result.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Rules subtable except Set Name.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Rules subtable displays these columns for the chosen signaling point:

Column	Description
ResultSet (in subtable heading)	Set of results associated with the rules.
Entries (in subtable heading)	Total number of entries in the subtable.

Column	Description
Set Name	Set name associated with the rule.
Index	Index number associated with the rule.
Operation Type	Types of messages on which this rule matches.
Protocol	Protocol used for matching by this rule.
Matches	Number of rule matches with result `Action Performed`.
Match Rate	Number of Matches per second for the rule.
Rule Parameters	Parameters that control the behavior of the rule.
Result Parameters	Parameters that control the behavior of the result associated with this rule.

Ruleset

The Ruleset subtable displays MLR ruleset information associated with the chosen result.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Ruleset subtable except Start Date and End Date.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The Ruleset subtable displays these columns for the chosen signaling point:

Column	Description
Rule Number (in subtable heading)	Index number of the rule with which this ruleset is associated.
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the ruleset.
Start Date	Starting date and time for this ruleset to become active.
End Date	Ending date and time for this ruleset to become active.
Segmented	Indicates whether this ruleset should process segmented messages.
Protocol	Default protocol for rules in this ruleset.
Search Type	Search type that this ruleset should perform.

SubTriggers

The SubTriggers subtable displays MLR subtrigger information associated with the chosen result.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the SubTriggers subtable.

For detailed information on working in tables, see Navigating Table Columns, page 5-24.

The SubTriggers subtable displays these columns for the chosen signaling point:

Column	Description
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the subtrigger.
Index	Index number associated with the subtrigger.
Action	Action taken by the subtrigger.
Matches	Number of subtrigger matches with result `Action Performed`.
Match Rate	Number of Matches per second for the subtrigger.
Parameters	Parameters that control the behavior of the subtrigger.

Triggers

The Triggers subtable displays MLR trigger information associated with the chosen result.

You can resize each column, or sort the table based on the information in one of the columns. By default, the MWTM displays all of the columns in the Triggers subtable except Set Name, Start Date, End Date, and Status.

The Triggers subtable displays these columns for the chosen signaling point:

Column	Description
Ruleset (in subtable heading)	Ruleset with which this trigger is associated.
Entries (in subtable heading)	Total number of entries in the subtable.
Set Name	Set name associated with the trigger.
Index	Index number associated with the trigger.
SubTriggers	Number of subtriggers associated with the chosen trigger.
Start Date	Date and time on which this trigger should begin filtering traffic. If no Start Date is configured, this field displays `N/A`.
End Date	Date and time on which this trigger should stop filtering traffic. If no End Date is configured, this field displays N/A.
Status	Current status of the trigger. Possible values are: • **Active**—Either there is a corresponding GTT table entry for the trigger or, if this is an MTP3 trigger, there is an available route to the appropriate point code. • **Inactive**—There is no corresponding GTT table entry or available route to the appropriate point code for the trigger. The trigger will never match and a configuration error is likely.
Action	Action that the trigger takes.

Column	Description
Prematches	Preliminary count of trigger matches.
Prematch Rate	Number of Prematches per second for the trigger.
Matches	Number of trigger matches with result `Action Performed`.
Match Rate	Number of Matches per second for the trigger.
Parameters	Parameters that control the behavior of the trigger.

Viewing RAN Shorthauls

To view RAN shorthauls that are associated with a RAN-O backhaul, select the backhaul object in the navigation tree in the left pane, and click the RAN Shorthauls tab in the right pane. The right pane displays a tabular list of RAN shorthauls that are associated with the chosen backhaul.

To view descriptions of the columns of the RAN shorthauls table, see .

Creating Virtual RAN Backhauls

You use the MWTM to create a virtual RAN backhaul by grouping real backhauls. A virtual backhaul is useful if you have configured several RAN backhauls for the same interface. To view the utilization for that interface, create a virtual RAN backhaul that contains all the real backhauls that you have configured for the interface.

Note When creating virtual RAN backhauls, observe the following restrictions:

- You cannot add a real backhaul to more than one virtual backhaul.

- To add a real backhaul to a virtual backhaul, you must first enable report polling on the node that is associated with the real backhaul. If you add a real backhaul to a virtual backhaul, and then disable report polling on the associated node, historical reporting for the virtual backhaul will not work! To restore historical reporting for the virtual backhaul, you must enable report polling on the associated node or remove the real backhaul from the virtual backhaul. To enable report polling on a node, you must access the node by using its command line interface.

To create a virtual RAN backhaul, right-click a RAN backhaul, then choose **Create Virtual RAN Backhaul**. The MWTM displays the Virtual RAN Backhaul Editor.

The Virtual RAN Backhaul Editor contains:

Field or Button	Description
Name	Name of the virtual RAN backhaul.
Available Backhauls	Pane that contains the Available Backhauls table, which contains these columns: - **Name**—Name of the RAN backhaul - **Node**—Node to which the RAN backhaul belongs

Field or Button	Description
Included Backhauls	Pane that contains the Included Backhauls table, which contains these columns: • **Name**—Name of the RAN backhaul • **Node**—Node to which the RAN backhaul belongs
Add	Adds the chosen backhaul to the Included Backhauls table.
Remove	Removes the chosen backhaul from the Included Backhauls table.
Save	Saves the virtual RAN backhaul and closes the Virtual RAN Backhaul Editor.
Cancel	Cancels the current operation and closes the Virtual RAN Backhaul Editor.
Help	Opens the Help window for this feature.

To create a virtual RAN backhaul:

Step 1   Enable report polling on the nodes associated with the backhauls that you plan to add to the virtual backhaul.

Step 2   Right-click a backhaul in the RAN Backhauls table or in a view in the navigation tree.

Step 3   Choose **Create Virtual RAN Backhaul** in the right-click menu.

The Virtual RAN Backhaul Editor appears.

Step 4   In the Available Backhauls pane, choose a backhaul from the table.

Step 5   Click **Add** to add the chosen backhaul to the Included Backhauls table.

Step 6   Repeat Step 5 for each additional backhaul you want to include in the virtual backhaul.

Step 7   To remove a backhaul from the Included Backhauls table, choose a backhaul from the table and click **Remove**.

Step 8   In the Name field at the top of the dialog box, enter a name for the virtual backhaul.

Step 9   Click **Save** to create the virtual RAN backhaul and close the dialog box.