CHAPTER 10

Viewing Network Topology

Note The web interface does not support viewing the network topology. You can view the network topology only in the MWTM client interface.

In addition to tabular (text) views of your network, the Cisco Mobile Wireless Transport Manager (MWTM) provides a topological (graphical) view of the objects in your network, including:

- RAN-O nodes
- RAN-O service modules
- RAN-O interfaces
- ITP signaling points
- ITP application servers
- ITP application server process associations
- ITP linksets
- Adjacent legacy nodes

Note The MWTM does not manage legacy nodes, but displays them in the topology map to help you visualize the interconnections between network objects.

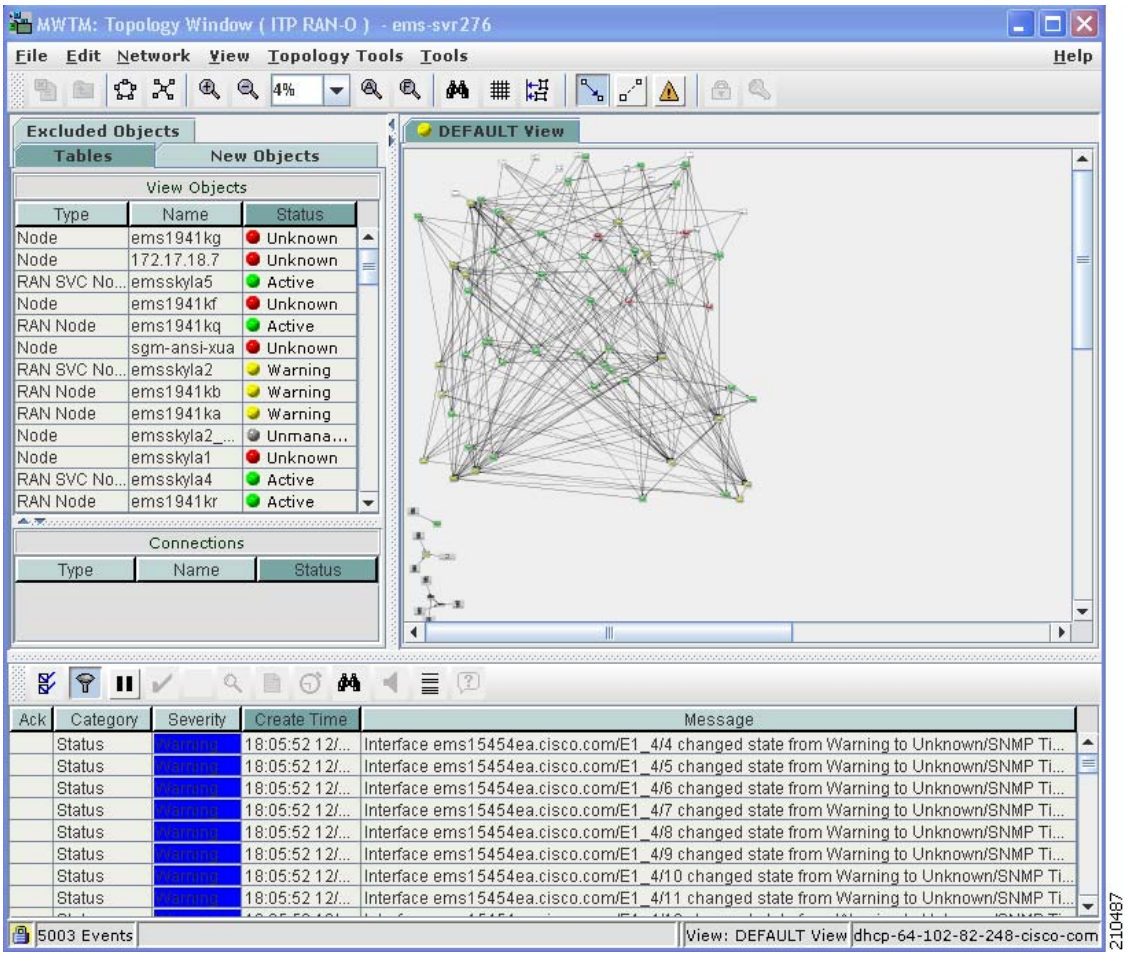
Any associated events also appear in the topology window. You can use the MWTM to customize the topological view (for details, see Chapter 7, "Managing Views").

To view the topology of your network, use one of these procedures:

- Choose **View > Topology** from the MWTM main menu.
- Right-click an object, then choose **View > Center in Topo** in the right-click menu.

The topology window appears.

Figure 10-1 Topology Window



The topology window shows tabular information about MWTM objects in the left pane and the graphical topology map in the right pane. Events associated with the selected object appear in the bottom pane.

The topology window contains:

- Topology Menu, page 10-3
- Topology Toolbar Buttons, page 10-4
- Topology Tabs, page 10-6
- Topology Map, page 10-11
- Topology Event Pane, page 10-16

The MWTM provides these functions related to the topology map:

- Creating a Custom Layout, page 10-16
- Finding an Object, page 10-17
- Centering the Topology Map on an Object, page 10-18
- Displaying Detailed Information About a Topology Map Element, page 10-18
- Printing the Topology Map, page 10-18
- Saving the Topology Map as a JPEG File, page 10-18
- Selecting a Directory for the JPEG File, page 10-19
- Activating a Magnetic Grid on the Topology Map, page 10-21
- Specifying a Color for the Magnetic Grid, page 10-22
- Specifying a Background Color for the Topology Map, page 10-24
- Aligning Objects on the Topology Map, page 10-25
- Hiding and Displaying Non-ITP Nodes and Linksets, page 10-26
- Locking and Unlocking the Position of an Icon, page 10-27
- Improving Topology Performance, page 10-27
- Saving the Topology Map, page 10-28
- Restoring the Topology Map, page 10-28

Related Topics:

- Diagnosing a Typical Network Problem, page D-5
- Changing MWTM Server Poller Settings, page 3-2
- Chapter 7, “Managing Views”

Topology Menu

The topology window is identical to the MWTM main menu. For detailed descriptions of the options it provides, see Using the MWTM Main Menu, page 4-33.

Topology Toolbar Buttons

The topology window contains these toolbar buttons:

Button	Description
Close view tab	Closes the currently visible view in the topology window. This option is dimmed if the currently visible view is the highest-level parent view.
Open parent view	Opens the parent view of the currently visible view in the topology window. This option is dimmed if the currently visible view is the highest-level parent view.
Lay out nodes in a circle	Shows the map in a circular layout.
Lay out nodes in a spring	Shows the map in a spring layout. That is, the MWTM draws nodes with the most lines closer to the center of the map, and draws nodes with fewer lines farther away. This is the default setting the first time the map appears. **Note** You can change how far apart to space the nodes when the MWTM draws the spring layout (see Changing Topology Settings, page 5-8).
Zoom in by a factor of 200%	Makes the map twice as large.
Zoom out by a factor of 50%	Makes the map half as large.
Zoom by percentage	Zooms the map by a selected percentage. You can select a percentage from the drop-down list box; or, enter a percentage and click **Enter**. Valid values are integers in the range 5 through 400.
Zoom in on an area	Zooms in on the selected area of the map. Click the button, then click in the topology map and drag a rectangle around the area on which you want to zoom. The MWTM expands the selected area to fill the topology map.
Zoom to fit window	Adjusts the size of the map to fit in the window. This is the default setting the first time the map appears.
Find objects	Opens the Find Objects dialog box, which you use to find and highlight an object in the topology window.
Set magnetic grid properties	Opens the Magnetic Grid Settings dialog box, which you use to activate and deactivate the magnetic topology grid, and modifies how it appears. With the grid activated, when you move objects on the topology map they automatically align with the grid.
Align objects on map	Opens the Align Objects dialog box, which you use to align two or more objects on the topology map.

Button	Description
Hiding/Showing non-ITP nodes (ITP only)	Hides or shows all non-ITP signaling points and linksets on the topology map. (Hidden signaling points and linksets still appear in the left pane.) The process determines whether the node's parent (visible on the topology maps) has an ITP MIB or not. If not, it is classified as a non-ITP node and it will be hidden or visible when the button is toggled. The MWTM automatically saves this setting (with non-ITP nodes and linksets either hidden or visible) with your preferences.
Node Dragging Optimizer	Turns the Node Dragging Optimizer on or off: • When the Node Dragging Optimizer is **On**, the MWTM hides linkset lines as you drag an object around the topology map. The MWTM draws the linkset lines when you drop the object in its final position. This is the default setting. • When the Node Dragging Optimizer is **Off**, the MWTM continually redraws linkset lines as you drag an object around the topology map. The MWTM automatically saves this setting (with the Node Dragging Optimizer on or off) with your preferences.
Hiding/Showing Dangling Connections	Hides or shows connections to objects that are not visible in the current view, which are called dangling connections. When the Hiding Dangling Connections is set to: • **Hide**, the MWTM hides dangling connections. This is the default setting. • **Show**, the MWTM shows dangling connections, drawing the objects in shades of gray to distinguish them from actual objects in the current view. The MWTM does not save this setting (with the Hiding Dangling Connections set to **Show** or **Hide**) when you save the view. To include a dangling connections in the current view, select the connection, then select **Include In View**.

Button	Description
Show/Hide event panel	Shows or hides the event panel at bottom.
Lock position or Unlock position	Locks or unlocks the position of an icon on the topology map. Locking the position of an icon can be useful if you want to keep the icon in its position, and you want to ensure you do not move it inadvertently. Locked icons do not appear in the circular or spring layouts. To lock the position of an icon, select: • An unlocked icon, then select **Lock position**. • A locked icon, then select **Unlock position**. This is the default setting. The MWTM automatically saves this setting (with icon positions locked or unlocked) with your view.

Topology Tabs

In the topology window, you can access:

- Tables Tab, page 10-6
- New Objects Tab, page 10-10
- Excluded Objects Tab, page 10-11

Tables Tab

The Tables tab in the left pane of the topology window contains:

- View Objects Table, page 10-6
- Connections Table, page 10-8

To display the Tables tab, select the Tables tab in the left pane of the topology window.

View Objects Table

The View Objects table shows information about the MWTM objects that are currently visible in the topology map:

- To redraw the topology map centered on a specific object, double-click the object in this table.
- You cannot select more than one object at a time in this table.
- To see the tooltip for each column in the table, place the cursor over a column heading.
- If a cell is too small to show all of its data, place the cursor over the cell to see the full data in a tooltip.

You can resize each column, or sort the table based on the information in one of the columns. By default, MWTM shows only the Type, Name, and Status columns in the View Objects table. By default, the MWTM sorts this table by Status.

To:

- Display hidden columns, right-click in the table heading and check the check boxes for the columns you want to display.
- Hide columns, right-click in the table heading and uncheck the check boxes for the columns you want to hide.

For more information about resizing, sorting, displaying, or hiding columns, see Navigating Table Columns, page 5-23.

The View Objects table contains:

Column	Description
Internal ID	Internal ID of the object. The internal ID is a unique ID for every object, that MWTM assigns for its own internal use. It can also be useful when the TAC is debugging problems.
Type	Object types can be ITP only, RAN-O only, or General to both types of networks. General object types include: • **Node**—Any interconnecting node that is not an MWR node. • **View**—Custom view (if one exists). ITP only object types include: • **ASP**—An application server process. • **SP**—A signaling point. RAN-O only object types include: • **RAN Node**—Mobile Wireless Router (MWR) node. • **RAN SVC Node**—A RAN service card in an Optical Networking System (ONS) node.
Name	Name of the object.
Node	Name of the node associated with the object.
Notes	Indicates whether a note is associate with the object.
Events	Indicates whether the object has a 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.) During Discovery, the MWTM might flag most objects with an event icon. If the event icons are too distracting, choose **Edit > Clear All Events** from the MWTM main menu to remove them.
Last Status Change	Date and time that the status of the object last changed.

Column	Description
Status	Current status of the object. Possible values are: • **Active (green)** • **Unknown (red)** • **Unmanaged (gray)** • **Warning (yellow)** For detailed definitions of each status, see the "Status Definitions" section on page E-1.
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 MWTM in: • The default directory, */opt*, then the file resides at */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • A different directory, then the help directory and file reside 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 status reason 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" section on page B-1.
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. Users with authentication level Power User (level 2) and higher can edit this field.

Connections Table

The Connections table shows information about the connections associated with the object that you selected in the View Objects table, or the object currently selected in the topology map.

- To redraw the topology map centered on a specific object, double-click the object in this table.
- You cannot select more than one object at a time in this table.
- To see the tooltip for each column in the table, place the cursor over a column heading.

- If a cell is too small to show all of its data, place the cursor over the cell to see the full data in a tooltip.

You can resize each column, or sort the table based on the information in one of the columns. By default, MWTM shows only the Type, Name, and Status columns in the View Objects table. By default, the MWTM sorts this table by Status. To:

- Display hidden columns, right-click in the table heading and check the check boxes for the columns that you want to display.
- Hide columns, right-click in the table heading and uncheck the check boxes for the columns that you want to hide.

For more information about resizing, sorting, displaying, or hiding columns, see Navigating Table Columns, page 5-23.

The View Connections table contains:

Column	Description
Internal ID	Internal ID of the object. The internal ID is a unique ID for every object, which MWTM assigns for its own internal use. It can also be useful when the TAC is debugging problems.
Type	Object types can be ITP only or RAN-O only. ITP only object types include: • **Linkset**—A linkset associated with a signaling point. • **ASPA**—An application server process association associated with a signaling point. RAN-O only object types include: • **RAN Backhaul**—Virtual RAN backhaul associated with a RAN node or RAN SVC node. • **GSM Interface**—GSM interface associated with a RAN node or RAN SVC node. • **Universal Mobile Telecommunications System (UMTS) Interface**—UMTS interface associated with a RAN node or RAN SVC node.
Name	Name of the object.
Node	Name of the node that is associated with the object.
Notes	Indicates whether the object has an associated note.
Events	Indicates whether a recent event is associated with the object. (Even if the server purges all of the events associated with the object, MWTM continues to display the event icon in this field.) During Discovery, the MWTM might flag most objects with an event icon. If the event icons are too distracting, choose **Edit > Clear All Events** from the MWTM main menu to remove them.
Last Status Change	Date and time that the status of the object last changed.

Column	Description
Status	Current status of the object. Possible values are: • **Active (green)** • **Unknown (red)** • **Unmanaged (gray)** • **Warning (yellow)** For detailed definitions of each status, see Status Definitions, page E-1.
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 file in: • The default directory, */opt*, then the file resides at */opt/CSCOsgm/apache/share/htdocs/eventHelp* directory. • A different directory, then the help directory and file reside 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 status reason in a tooltip. The status reasons appear 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 Command Reference, page B-1.
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. Users with authentication level Power User (level 2) and higher can edit this field.

New Objects Tab

The New Objects tab in the left pane of the topology window shows graphical elements for newly discovered objects, based on these criteria. If you are using an MWTM client with:

- The DEFAULT view set, this tab never contains any objects. In the DEFAULT view, the MWTM adds all newly discovered objects to the topology map as soon as they are discovered.
- A custom view set, this tab contains all objects discovered since the topology window was opened in this session that have *not* been excluded in the Excluded from View table of the View Editor window, or that are not in the current view.

To display the topology New Objects tab, select the New Objects tab in the left pane of the topology window.

To add a newly discovered object to the topology map, select one or more objects and hold down the left mouse button to drag them to the map.

To exclude a newly discovered object, use the View Editor window (see Creating a New View, page 7-9).

Excluded Objects Tab

The topology Excluded Objects tab in the left pane of the topology window shows graphical elements for excluded objects. Excluded objects are objects that you:

- Exclude from the topology map by right-clicking the object and selecting Exclude From View.
- Move to the Excluded from View table of the View Editor window (see Creating a New View, page 7-9).

To display the topology Excluded Objects tab, select the Excluded Objects tab in the left pane of the topology window.

To add an excluded object to the topology map, select the object hold down the left mouse button to drag it to the map. The MWTM no longer excludes the object, and removes it from the:

- Excluded Objects tab of the topology window.
- Excluded from View table of the View Editor window.

When you exclude a node from the topology map, the MWTM also removes adjacent legacy nodes from the map. When you add an excluded node back to the topology map, the adjacent legacy nodes reappear.

Topology Map

The topology map in the right pane of the topology window shows the objects and views in your network in an easy-to-read graphical format.

Views

If you have defined custom views, you can view them in the topology map. The MWTM shows a tab for each visible view. Each tab shows a colored ball that indicates the current status of that view:

- **Active (green)**
- **Warning (yellow)**

Note For detailed definitions of each status, see Status Definitions for Views, page E-2.

Excluded and Unmanaged Objects

The MWTM removes from the topology map any objects and their associated objects (including adjacent legacy nodes) that you exclude from the current view (see Excluded Objects Tab, page 10-11 and Creating a New View, page 7-9).

If you unmanage an object from the topology map right-click menu (see Topology Right-Click Menu: Object, page 10-16) the MWTM marks the object status as Unmanaged and removes any adjacent legacy nodes from the topology map.

Tooltips

To see a tooltip, place the cursor over an object. For details on turning off tooltips, see Changing Topology Settings, page 5-8.

Viewing Associated Objects

To view objects associated with a selected object, within the:

- Tabs in the View Objects pane, click an object. Any associated objects (such as signaling points with associated linksets) appear in the Connections pane.
- Content area, click a single line, a heavy line, a diamond, circle, arrowhead, or double-triangle to:
  - Highlight the closest associated node in the View Objects pane within a tab. For example, if a line connects node **sgm-2600a** and node **sgm-2600b**, and you click the line closer to node **sgm-2600a**, then the MWTM highlights that node in the View Objects pane.
  - Display all objects (if any) associated with that node in the Connections pane within a tab.
  - Highlight the clicked object (if it is configured) in the Connections pane within a tab.

Viewing Details for an Object

To display the Details tab for any object in the map, double-click it. If multiple options are possible, the Selection dialog box appears. Highlight the object, then click **Select**.

Navigating and Scrolling

To:

- Scroll around in the topology map using keyboard options, click anywhere in the map, then click the arrow, **Page Up**, and **Page Down** keys.
- Redraw the topology map centered on a specific object, double-click the object in the View Objects pane within a tab.
- Activate or change the magnetic topology grid, which can help you align objects when you move them, use the Magnetic Grid Settings dialog box (see Activating a Magnetic Grid on the Topology Map, page 10-21).
- Align two or more objects on the topology map, use the Align Objects dialog box (see Aligning Objects on the Topology Map, page 10-25).

Saving the Topology Map

To save the topology map as a JPEG file, use the Save as JPEG dialog box (see Saving the Topology Map as a JPEG File, page 10-18).

Hiding or Showing Dangling Connections

To hide objects that connect to objects that are not in the current view (called dangling connections), click the **Hiding/Showing Dangling Connections** button to set it to **Hide**. To show dangling connections, click the **Hiding/Showing Dangling Connections** button to set it to **Show**. The MWTM draws the objects in shades of gray to distinguish them from actual objects in the current view. The MWTM does not save this setting (with the Hiding Dangling Connections set to **Show** or **Hide**). To include a dangling object in the current view, right-click the object and select **Include In View**.

Locking and Unlocking Icon Positions

To lock the position of an icon on the topology map, select an unlocked icon, then select **Lock position**.

Locking the position of an icon can be useful if you want to keep the icon in its position, and you want to ensure that you do not move it inadvertently. The MWTM does not include locked icons in the circular or spring layouts.

To unlock the position of an icon on the topology map, click a locked icon, then select **Unlock position**.

Object Types within the Topology Map

The topology map might contain graphical elements for any of these objects, which the MWTM automatically assigns:

- Application server process
- BTS—Cisco Broadband Telephony Services (BTS) 10200 Softswitch
- Cisco 2600 series router—Cisco 2650, Cisco 2650XM, Cisco 2651, Cisco 2651XM
- Cisco 2811 series router
- Cisco 7202 series router
- Cisco 7204 series router—Cisco 7204, Cisco 7204VXR
- Cisco 7206 series router—Cisco 7206, Cisco 7206VXR
- Cisco 7301 series router
- Cisco 7304 series router
- Cisco 7505 series router
- Cisco 7507 series router: Cisco 7507, Cisco 7507mx, Cisco 7507z
- Cisco 7513 series router: Cisco 7513, Cisco 7513mx, Cisco 7513z
- Cisco 7600 series router: Cisco 7603, Cisco 7604, Cisco 7606, Cisco 7609, Cisco 7613
- Cisco MWR 1900 series router
- Cloud— A collection of objects, called a submap. A submap can also contain other submaps.
- IP device, other than other than those listed previously (if assigned by a user; see Editing Properties, page 6-29)
- PGW—Cisco Public Switched Telephone Network (PSTN) Gateway (PGW) 2200 Softswitch
- Signaling point instance—An SCP, SSP, or STP, or an ITP instance (if the ITP is configured for multi-instance)
- SS7—The MWTM is unable to determine the node type.
- A line indicates a single logical connection configured between two nodes. A line that:
  - Ends in a diamond indicates that the connection has at least one configured interface or linkset associated with the node.
  - Ends in a circle indicates that the connection is a virtual linkset, associated with a signaling point.
  - Does not end in a diamond or circle indicates that the interface or linkset is not configured on the node or cannot be shown because the MWTM is not managing the node.
  - Ends in an arrowhead indicates that the connection is an application server process association.
  - Ends in a double-triangle indicates a connection to a view that has multiple interfaces.

- A heavy line indicates that two or more interfaces or linksets exist between two nodes, or between views and other objects.

In addition, users can assign graphical elements for these objects (see Editing Properties, page 6-29):

- **Building**—Icon representing a collection of objects within a building.
- **City**—Icon representing a collection of objects within a city.
- **Database**—Icon representing a database object.
- **MatedPair**—Mated pair of signaling points.
- **MSC**—Mobile switching center.
- **Node-B**—Radio transmission (or reception) unit for communication between radio cells in a UMTS network (Node-B resides at the cell site).

Note The MWTM does not manage the Node B but displays the object in the topology window to help you visualize the network.

- **RAN SVC Node**—RAN service module card.
- **RNC**—Radio Network Controller used in a UMTS network to aggregate multiple Node-B units.

Note The MWTM does not manage the RNC but displays the object in the topology window to help you visualize the network.

- **SCP**—Service control point.
- **SSP**—Service switching point.
- **STP**—Signal transfer point.
- **Tower**—Icon representing a PC tower.
- **TrafficGenerator**—Icon representing a device or emulator used to generate traffic, usually in a test environment.
- **Unknown**—Node that does not respond to SNMP requests for supported MIBs.
- **Workstation**—Icon representing a workstation.
- **Workstation2**—Icon representing a different workstation.

The color of a graphical element indicates its current status. For detailed definitions of each status, see Status Definitions, page E-1.

Note If more than one object is configured on the connection, the color associated with the object that is in the most compromised state represents the status color of the connection. See Table 10-1 for examples.

Table 10-1 describes the color of the connection state when objects in a configured connection have the possible colors (which represent states) associated with them.

Table 10-1 Configured Connection Status Colors and States

If…	…then the connection status color is	…and the state is
All objects are green	Green	Active
At least one object is yellow, and the others are green	Yellow	Warning
At least one object is red, and the others are green or yellow	Red	Alarm

A note icon in the upper-left corner of an object means a user has attached a descriptive string.

An event icon in the upper-right corner of an object means it has a recent event associated.

The topology map also provides right-click menus for elements. For more information, see these sections:

- Topology Right-Click Menu: Map, page 10-15
- Topology Right-Click Menu: Object, page 10-16

Topology Right-Click Menu: Map

The topology window provides a subset of the MWTM main menu as a right-click menu. To see this menu for a map, right-click in a blank area of the topology map. The topology map right-click menu displays:

Command	Description
Zoom In (Ctrl-=)	Makes the map twice as large.
Zoom Out (Ctrl-- or Ctrl-Minus)	Makes the map half as large.
Zoom Area	Zooms in on the selected area of the map.
Zoom Fit	Adjusts the size of the map to fit in the window. This is the default setting the first time the map appears.
Layout > Circular	Shows the map in a circular layout.
Layout > Spring	Shows the map in a spring layout. That is, the MWTM draws nodes with the most links closer to the center of the map, and draws nodes with fewer links farther away. This is the default setting the first time the map appears.
Find	Opens the Find Objects dialog box, which you use to find and highlight an object in the topology window.
Restore Positions	Restores the view to the last saved view.
Save As JPEG (Ctrl-J)	Opens the Save as JPEG dialog box, enabling you to save the topology map to a JPEG file.
Magnetic Grid	Opens the Magnetic Grid Settings dialog box.
Change Background Color	Opens the Select Background Color dialog box, which you use to select a color for the background of the topology map.

Command	Description
Align	Opens the Align Objects dialog box, which you use to align two or more objects on the topology map.
Create Subview	Opens the View Editor window, which you use to select a new view to display in the topology window.
Open Parent View	Opens the parent view of the currently visible view in the topology window. This option is dimmed if the currently visible view is the highest level parent view.
Close View	Closes the currently visible view in the topology window. This option is dimmed if the currently visible view is the highest level parent view.

Topology Right-Click Menu: Object

The topology window displays a subset of the MWTM main menu as a right-click menu. To see this menu for any object in the topology window, right-click on an object in the topology map in the right pane. Options may vary depending on the selected object type.

For a list of right-click menu options, see Viewing the Right-Click Menu for an Object, page 8-3.

Topology Event Pane

The event pane at the bottom of the topology window shows any current events on the selected object. For details about the buttons and fields in the event pane, see Chapter 9, “Managing Events.”

Creating a Custom Layout

You can use the MWTM to create a custom layout for the topology map by manually moving objects on the map and by grouping them or isolating them to meet your needs. To move:

- A single object, click and drag the object to its new position.
- More than one object at the same time, press the Shift key and at the same time, select the objects and drag them. Objects keep their positions relative to one another.

When you are satisfied with the new topology map layout, choose **File > Save View** from the MWTM main menu. The MWTM saves the changes you have made to the network view, including any changes you have made to the topology map layout.

Finding an Object

Some topology maps are so large and complex that it can be difficult to find a specific object.

If the object appears in the tabs in the left pane, select the object, and the MWTM highlights it in the topology map.

If the object does *not* appear in the tabs in the left pane, click the **Find objects** button in the topology window; or, choose **Edit > Find** from the MWTM main menu. The Find Object dialog box appears.

You can search by using the:

- Name
- Point code (for ITP signaling points)
- IP address (for RAN-O nodes)

The Find Object dialog box contains:

Field or Button	Description
Search string	Character string for which the MWTM should search.
OK	Launches the search. If: • No matching object is found, the MWTM shows an appropriate message. • Exactly one object is found that matches the **Search string**, the MWTM highlights the object in the Tables pane of the topology window, and zooms in on the selected object in the topology map. • More than one object is found that matches the **Search string**, the Choose dialog box appears, in which you can select from a list of the found objects (see Using the Selection Dialog, page 10-17).
Cancel	Closes the Find Objects dialog box without launching the search.

Using the Selection Dialog

If more than one object matches the Search string in the Find Objects dialog box, the Selection dialog box appears.

The Selection dialog box contains:

Field or Button	Description
Select one in list	Type, Name, or Status of the found objects. Select the object you want to find.
Select	Highlights the selected object in the left pane of the topology window, and zooms in on the selected object in the topology map.
Cancel	Closes the Selection dialog box without selecting an object.

Centering the Topology Map on an Object

To redraw the topology map centered on a specific object, double-click the object in one of the tabs.

Displaying Detailed Information About a Topology Map Element

To display detailed information about an element in the map, double-click it within the map, then respond to the prompts. Double click:

- An object to view the Details tab in the MWTM main menu for that object.
- A single line, or a diamond, circle, or arrowhead at the end of a single line, to display the MWTM main window details for that linkset or application server process association.
- A double-triangle at the end of a heavy line to display the Selection dialog box. (A heavy line indicates that two or more interfaces or linksets exist between two objects, or between views and other objects.) Then, select one of the interfaces or linksets to display the Selection dialog box for that interface or linkset.

Printing the Topology Map

To print the topology map, see Printing Windows, page 5-24.

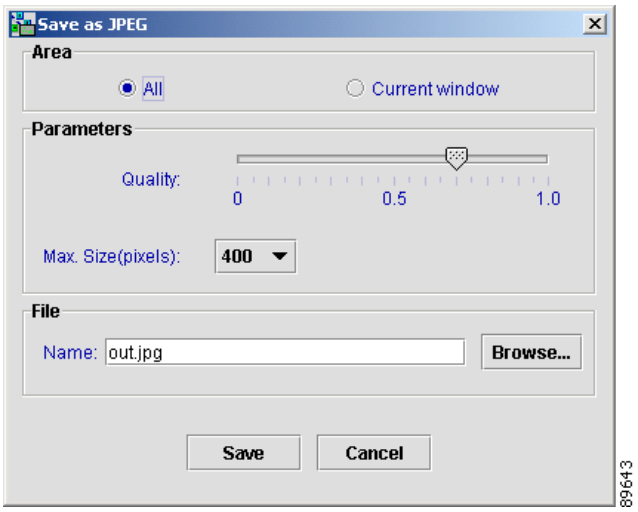
Saving the Topology Map as a JPEG File

You can use the MWTM to save the topology map to a JPEG file. You can save the entire topology map, or just the current window.

To save the topology map to a JPEG file, choose **Topology Tools > Save as JPEG** from the topology window.

The Save as JPEG dialog box appears.

Figure 10-2 Save as JPEG Dialog



The Save as JPEG dialog box contains:

Field or Button	Description
All	Saves the entire topology map as a JPEG file. This check box is checked by default.
Current Window	Saves just the portion of the topology map visible in the current window as a JPEG file. This check box is unchecked by default, which saves the entire map; not just the current window.
Quality	Specifies the quality of the JPEG file, from 0 (lowest quality) to 1.0 (highest quality). The default setting is 0.7, which is sufficient for most JPEG files.
Max. Size	Specifies the size of the JPEG file, in pixels. Choose a value from the drop-down list box. The valid range is 400-2400 pixels. The default value is 400 pixels, which is sufficient for most JPEG files.
Name	Enter a name for the JPEG file, or accept the default filename, *out.jpg*. The default directory for the JPEG file is the directory in which you installed the MWTM client: • In Solaris/Linux, the default installation directory for the MWTM client is */opt/CSCOsgmClient*. • In Windows, the default installation directory for the MWTM client is *C:\Program Files\SGMClient*. • If you installed the MWTM client in a different directory, then the installation directory resides in that directory. If you do not want to save the JPEG file to the default directory, click **Browse** to select a different directory.
Browse	Opens the Save dialog box for a topology map (Figure 10-3), which you use to specify or select a name when you save the JPEG file. If you do not want to save the JPEG file to the default directory, click **Browse** to select a different directory.
Save	Saves the JPEG file and closes the Save as JPEG dialog box.
Cancel	Closes the Save as JPEG dialog box without saving the JPEG file.

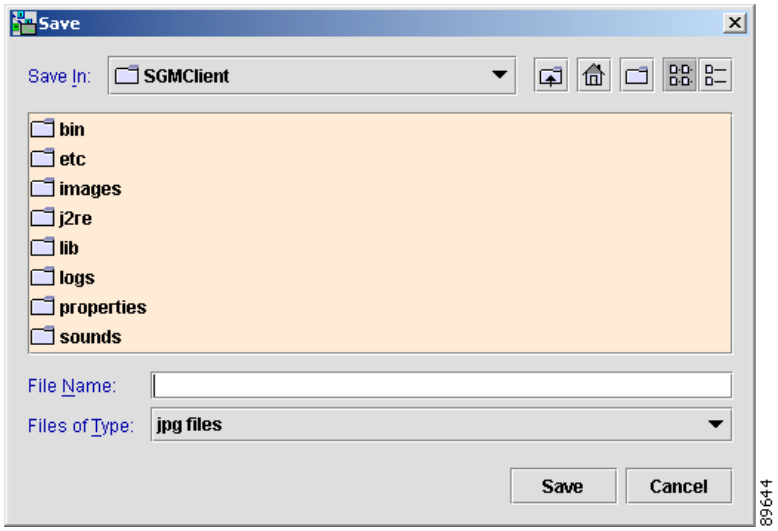
Selecting a Directory for the JPEG File

You can use the MWTM to specify or select a name or directory when you save a topology map to a JPEG file. You can save the entire topology map, or just the current window.

To specify a name or directory for the JPEG file, click **Browse** in the Save as JPEG dialog box.

The Save dialog box appears for a topology map.

Figure 10-3 Save Dialog for a Topology Map



The Save dialog box for a topology map contains:

Field or Button	Description
Save In	Selects the directory in which you want to save the topology map JPEG file. You can accept the default directory, or select a new directory from the drop-down list box.
File Name	Enter a name for the JPEG file, or select a file from those listed in the **Save In** field.
Files of Type	Specifies the type of file to save, and shows all files of that type in the selected directory. Select a file type from the drop-down list box: • **All files**—Shows all files in the selected directory, and saves the topology map file as a JPEG file. • **jpg files**—Shows only JPEG files in the selected directory, and saves the topology map file as a JPEG file. This is the default value.
Up One Level	Shows the subfolders and files that are in the folder that is up one level from the currently visible folder.
Desktop	Shows the subfolders and files that are on your workstation desktop.
Create New Folder	Creates a new subfolder in the currently visible folder.
List	Shows only icons for subfolders and files.
Details	Shows detailed information for subfolders and files, including their size, type, date they were last modified, and so on.
Save	Saves the file and closes the Save dialog box for a topology map. When you are satisfied with the settings, click **Save**. The MWTM closes the Save dialog box for a topology map and populates the Name field in the Save as JPEG dialog box with the new name and directory.
Cancel	Closes the Save dialog box for a topology map without saving the file.

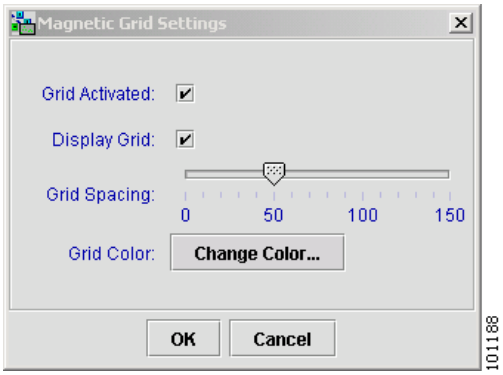
Activating a Magnetic Grid on the Topology Map

You can use the MWTM to activate the magnetic topology grid and change how it appears. With the grid activated, when you move objects on the topology map they align with the grid.

Note Magnetic grid settings are *not* saved when you save the view.

To activate or change the magnetic topology grid, choose **Topology Tools > Magnetic Grid** from the topology window. The Magnetic Grid Settings dialog box appears.

Figure 10-4 Magnetic Grid Settings Dialog



The Magnetic Grid Settings dialog box contains:

Field or Button	Description
Grid Activated	Specifies whether the magnetic topology grid is activated. To: • Activate the grid, check this check box. • Deactivate the grid, uncheck this check box. This is the default setting.
Display Grid	Specifies whether the grid should be visible on the topology map. To: • Display the grid, check this check box. This is the default setting. • Hide the grid, uncheck this check box. If **Grid Activated** is not checked, this check box is dimmed.
Grid Spacing	Specifies the spacing between lines on the grid, in pixels. To specify the spacing between lines on the grid, in pixels, check the **Grid Activated** check box, then select a **Grid Spacing** level. The valid range is 0-150 pixels. The default setting is 50 pixels, which is sufficient for most topology maps.
Grid Color	Opens the Select Grid Color dialog box. To specify a color for the grid, check the **Grid Activated** check box, then click **Change Color** in the Grid Color field. The MWTM opens the Select Grid Color dialog box (Figure 10-5).

Field or Button	Description
OK	Sets the new grid settings and closes the Magnetic Grid Settings dialog box. When you are satisfied with the magnetic grid settings, click **OK**.
Cancel	Closes the Magnetic Grid Settings dialog box without changing any settings.

Specifying a Color for the Magnetic Grid

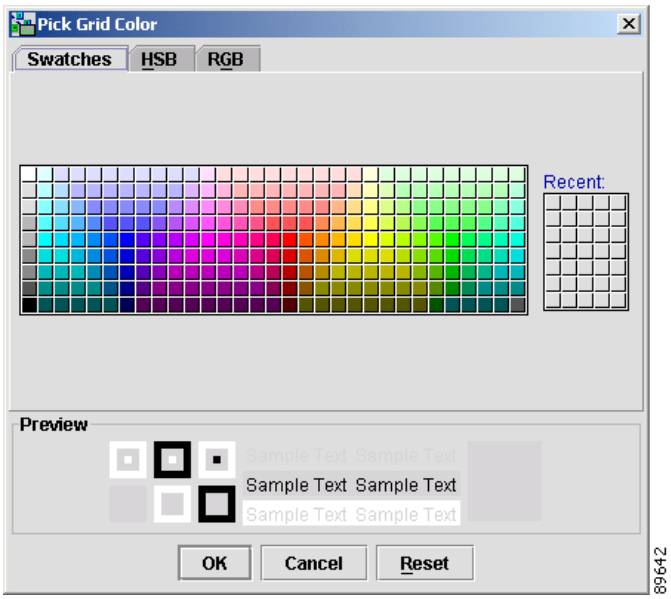
You can use the MWTM to customize the color of the magnetic topology grid.

Note The grid color is *not* saved when you save the view.

To specify a color for the grid, check the Grid Activated check box in the Magnetic Grid Settings dialog box, then click **Select** in the Grid Color field.

The Select Grid Color dialog box opens.

Figure 10-5 Select Grid Color Dialog



The Select Grid Color dialog box contains:

- Swatches Pane (Recommended), page 10-23
- HSB Pane, page 10-23
- RGB Pane, page 10-23
- Select Grid Color Field and Buttons, page 10-23

Related Topic:

Activating a Magnetic Grid on the Topology Map, page 10-21

Swatches Pane (Recommended)

You can use the Swatches pane of the Select Grid Color dialog box to select a grid color from a set of color swatches. This is the recommended method for selecting a grid color.

To display the Swatches pane, click the Swatches tab in the Select Grid Color dialog box.

To select a grid color, select a swatch. The selected color appears in the Preview field. When you are satisfied with the color, click **OK**.

HSB Pane

You can use the HSB pane of the Select Grid Color dialog box to select a grid color based on color hue, saturation, and brightness (HSB).

To display the HSB pane, click the HSB tab in the Select Grid Color dialog box.

To select a grid color, use one of these procedures:

- Select a color range on the vertical color bar, then select a specific color by moving the cursor around on the color square.
- Enter specific values in the hue (H), saturation (S), and brightness (B) fields.

The selected color appears in the Preview field. When you are satisfied with the color, click **OK**.

RGB Pane

You can use the RGB pane of the Select Grid Color dialog box to select a grid color based on the red, green, and blue (RGB) content of the color.

To display the RGB pane, click the RGB tab in the Select Grid Color dialog box.

To select a grid color, select values for the Red, Green, and Blue fields. The selected color appears in the Preview field. When you are satisfied with the color, click **OK**.

Select Grid Color Field and Buttons

The Select Grid Color dialog box contains:

Field	Description
Preview	Shows a preview of the currently selected grid color. Whichever method you choose to select a grid color, the selected color appears in the Preview field. When you are satisfied with the color, click **OK**.
OK	Sets the grid color as shown in the Preview field, and closes the Select Grid Color dialog box.
Cancel	Closes the Select Grid Color dialog box without selecting a grid color.
Reset	Resets the grid color to its initial setting.

Specifying a Background Color for the Topology Map

You can use the MWTM to customize the background color of the topology map.

Note The background color is *not* saved when you save the view.

To specify a background color for the topology map, right-click in a blank area of the topology map, then select **Change Background Color** from the right-click menu.

The Select Background Color dialog box contains:

- Swatches Pane (Recommended), page 10-24
- HSB Pane, page 10-24
- RGB Pane, page 10-24
- Select Background Color Field and Buttons, page 10-25

Swatches Pane (Recommended)

You can use the Swatches pane of the Select Background Color dialog box to select a background color from a set of color swatches. This is the recommended method for selecting a background color.

To display the Swatches pane, click the Swatches tab in the Select Background Color dialog box.

To select a background color, select a swatch. The selected color appears in the Preview field. When you are satisfied with the color, click **OK**.

HSB Pane

You can use the HSB pane of the Select Background Color dialog box to select a background color based on color hue, saturation, and brightness (HSB).

To display the HSB pane, click the HSB tab in the Select Background Color dialog box.

To select a grid color, use one of these procedures:

- Select a color range on the vertical color bar, then select a specific color by moving the cursor around on the color square.
- Enter specific values in the hue (H), saturation (S), and brightness (B) fields.

The selected color appears in the Preview field. When you are satisfied with the color, click **OK**.

RGB Pane

You can use the RGB pane of the Select Background Color dialog box to select a background color based on the red, green, and blue (RGB) content of the color.

To display the RGB pane, click the RGB tab in the Select Background Color dialog box.

To select a background color, select values for the Red, Green, and Blue fields. The selected color appears in the Preview field. When you are satisfied with the color, click **OK**.

Select Background Color Field and Buttons

The Select Background Color dialog box contains:

Field	Description
Preview	Shows a preview of the currently selected background color. Whichever method you choose to select a background color, the selected color appears in the Preview field. When you are satisfied with the color, click **OK**.
OK	Sets the background color as shown in the Preview field, and closes the Select Background Color dialog box.
Cancel	Closes the Select Background Color dialog box without selecting a background color.
Reset	Resets the background color to its initial setting.

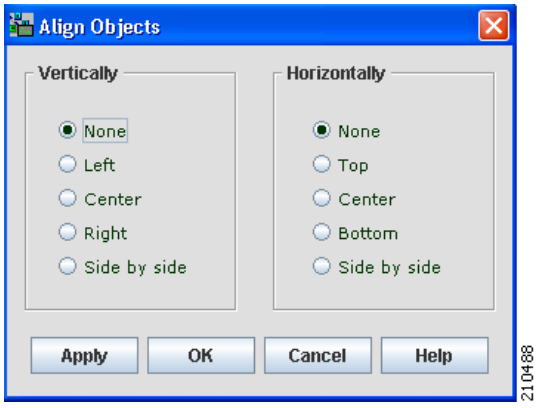
Aligning Objects on the Topology Map

Note To unalign objects, drag and drop the object to move it on the topology map.

You can use the MWTM to align two or more objects on the topology map. You can align the objects based on their left, right, top, or bottom edges, or you can center them in the map. The MWTM saves the alignment when you save the view.

To align objects, select the objects that you want to align, then choose **Topology Tools > Align** from the topology window. The Align dialog box appears.

Figure 10-6 Align Dialog



The Align dialog box contains:

Field	Description
Vertically: None	Does not align the selected objects vertically.
Vertically: Left	Aligns the selected objects vertically, aligned with the left edge of the left selected object.
Vertically: Center	Aligns the selected objects vertically, with centers aligned.
Vertically: Right	Aligns the selected objects vertically, aligned with the right edge of the right selected object.
Vertically: Side by side	Aligns the selected objects vertically, aligned side-by-side, with no horizontal space between the objects. (There might still be vertical space between the objects.)
Horizontally: None	Does not align the selected objects horizontally.
Horizontally: Top	Aligns the selected objects horizontally, aligned with the top edge of the top selected object.
Horizontally: Center	Aligns the selected objects horizontally, with centers aligned.
Horizontally: Bottom	Aligns the selected objects horizontally, aligned with the bottom edge of the bottom selected object.
Horizontally: Side by side	Aligns the selected objects horizontally, aligned side-by-side, with no vertical space between the objects. (There might still be horizontal space between the objects.)
Apply	Aligns the selected objects and keeps the Align dialog box open, enabling you to continue aligning objects.
OK	Aligns the selected objects and closes the Align dialog box.
Cancel	Closes the Align dialog box. Changes you applied are saved; other changes are not saved.
Help	Opens the Help window for this object.

Hiding and Displaying Non-ITP Nodes and Linksets

Note This function applies only to ITP objects. If you have not discovered ITP objects in your network, the Hiding/Showing Non-ITP Nodes button does not appear.

To hide all non-ITP nodes and linksets on the topology map (the default setting), click the **Hiding/Showing Non-ITP Nodes** button. (The hidden signaling points and linksets are still visible in the left pane.)

To display all hidden nodes and linksets on the topology map, click the **Hiding/Showing Non-ITP Nodes** button again.

The MWTM automatically saves this setting (with non-ITP nodes and linksets either hidden or visible) with your preferences.

Locking and Unlocking the Position of an Icon

You can use the MWTM to lock the position of an icon on the topology map. Locking the position of an icon can be useful if you want to keep the icon in its position, and you want to ensure that you do not move it inadvertently. The MWTM does not include locked icons in the circular or spring layouts.

- To lock the position of an icon on the topology map, right-click an unlocked icon, then select **Lock Position**.
- To unlock the position of an icon on the topology map, right-click a locked icon, then select **Unlock Position**. This is the default setting.

The MWTM saves this setting (with icon positions locked or unlocked) when you save the view.

Improving Topology Performance

In certain cases, you can enhance topology performance by:

- Turning Off Antialiasing, page 10-27
- Connecting Locally for Large Networks—Solaris Clients Only, page 10-27
- Hiding and Redrawing Connections When Redrawing, page 10-28
- Hiding and Showing Connections When Redrawing, page 10-28

Turning Off Antialiasing

Antialiasing, which is on by default, improves the appearance of the icons and connections in the topology map. However, antialiasing can cause an unexpected delay in the MWTM client on a remote workstation (that is, a Solaris/Linux workstation using xhost, or a Windows workstation by using an X-Window system emulator such as eXceed or Reflection X).

You can use the MWTM to turn off antialiasing to improve the performance of the MWTM client on a remote workstation. To do so, check the **X Performance Enhancer (AntiAliasing Off)** check box in the Topology settings in the Preferences window (see Changing Topology Settings, page 5-8).

To turn antialiasing back on, uncheck the check box.

Tip Keep in mind that for small networks, performance is always better if you access the MWTM by installing the MWTM client on the remote workstation.

Connecting Locally for Large Networks—Solaris Clients Only

If you are using a remote Solaris client and you have a large network, use a local Solaris client with a graphics card and an attached monitor, rather than remote access, to improve topology performance.

Note This issue might also cause an unexpected delay in the unsupported Linux client.

Hiding and Redrawing Connections When Redrawing

To aid performance, you can use the MWTM to hide connection lines as you drag an object around the topology map, then re-draw the connection lines when you drop the object in its final position. To do so, click the **Node Dragging Optimizer** button to turn it on. This is the default setting.

To have the MWTM continually redraw connection lines as you drag an object around the topology map, click the **Node Dragging Optimizer** button to turn it off.

The MWTM automatically saves this setting (with the Node Dragging Optimizer on or off) with your preferences.

Hiding and Showing Connections When Redrawing

To aid performance, you can use the MWTM to hide connections linked to objects that are not in the current view, called dangling connections. To do so, click the **Hiding/Showing Dangling Connections** button to set it to Hide. This is the default setting.

To show dangling connections, click the **Hiding/Showing Dangling Connections** button to set it to Show. The MWTM draws the connections in shades of gray to distinguish them from actual objects in the current view.

The MWTM does *not* save this setting (with the Hiding Dangling Connections set to Show or Hide) when you save the view.

To include a dangling connection in the current view, right-click the connection and select **Include In View**.

Saving the Topology Map

When you are ready to close the topology window, choose **File > Save View** from the MWTM main menu. The MWTM prompts you to save any changes you made to the network view, including any changes you have made to the topology map layout, and closes the window (see Closing the View Editor Window, page 7-15).

Restoring the Topology Map

You can use the MWTM to restore the topology map to the way it looked in the last saved view. To do so, choose **Topology Tools > Restore Positions** from the topology window. The MWTM restores the view.