



NMT Map

The NMT Network Display Tool, also known as the Network Design Topology Map or NMT Map, provides a useful way to visualize your network model. The map tool provides the following features:

- A graphical display of your topology
- Aid in visualizing of traffic levels.
- Helps you see the effects of node or link failures in your network.
- Aid in visualizing a PNNI Peer Group hierarchy of logical nodes and logical links.
- Assists in the design of multiple peer group PNNI networks by enabling you to form logical groups of nodes and to easily change the groupings.



Note

The Map tool is only available in NMT running on UNIX (Solaris) operating systems. NMT for Windows does not contain the Map tool.

NMT Map Startup

After running the Route or Optimize commands from the NMT Execute menu, start the map by selecting MAP from the NMT Display Menu. It may take several seconds for the MAP window to display.

Once the NMT Map is on screen, you can drag it to a suitable location and size it appropriately.

A PNNI network introduces the concept of a peer group, which is a collection of physical nodes. A group is represented by a logical node, which the NMT displays as a colored circle. PNNI networks allow a hierarchy of groups, with higher level groups being collections of logical nodes. The NMT Map supports the grouping of physical nodes into a logical node for any network.

For a network which has groups defined, the map only shows the highest level logical nodes when it is first opened (Figure 10-1). If all nodes have been assigned to peer groups, no actual nodes will be shown. If some nodes have not been assigned to peer groups, those nodes will also be shown. Nodes that have no map coordinates will show up in the upper left corner. You must drag them to their proper place on the map.



Note

Most networks that have been obtained using the Configuration Extraction Tool, whether or not they are on PNNI networks, will be part of one logical group consisting of the entire network. When the map is invoked on such a network, it will usually display a single isolated group.

Figure 8-1 Network View Showing Logical Nodes

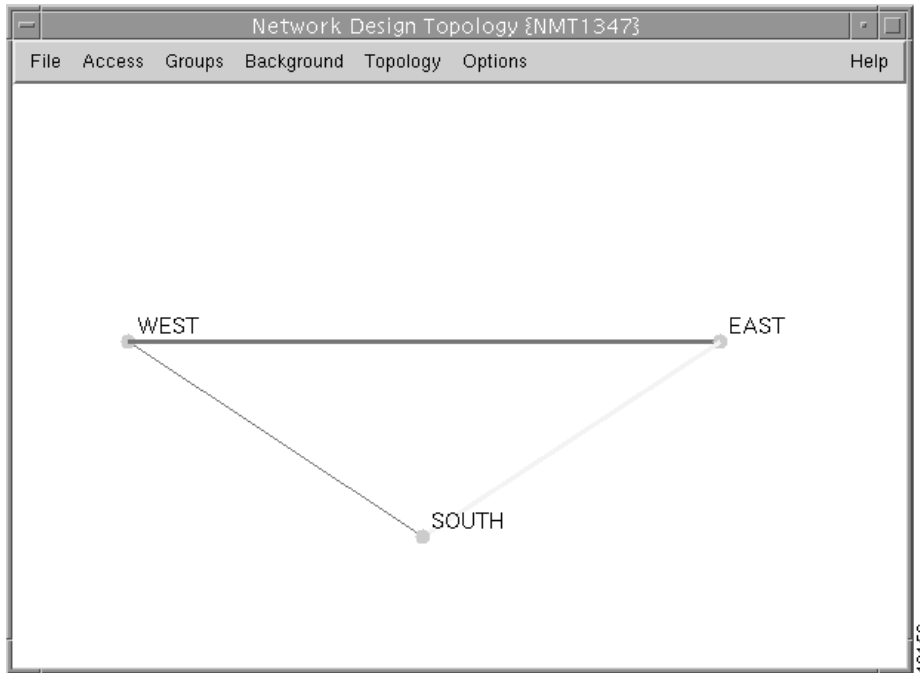
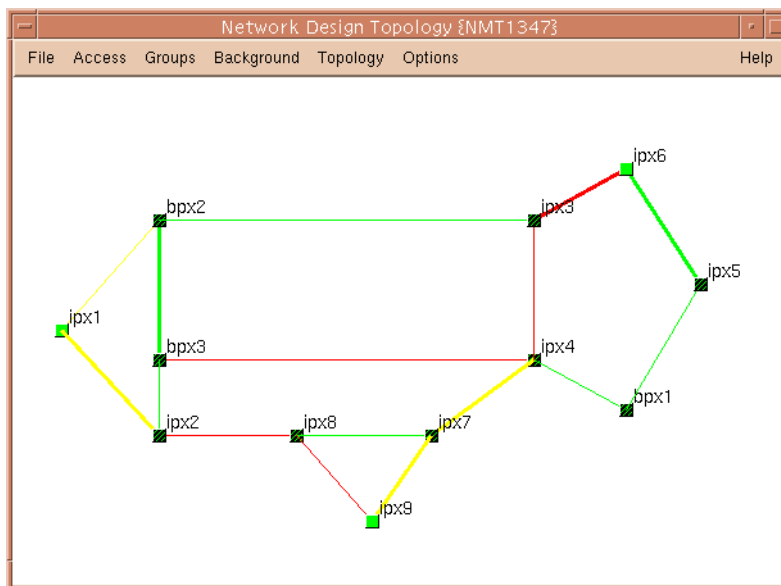


Figure 10-2 shows an example of the physical network corresponding to Figure 10-1. The physical nodes are shown as squares and the links between them as lines.

If multiple groups are defined and a link has ends in two different groups, the nodes at each end are called border nodes. The NMT Map highlights border nodes by displaying them as striped squares. The NMT Map also displays links in two-line thickness. A thin line indicates that there is only one trunk between the end points; a thick line indicates multiple trunks. Figure 11-2 shows an example of all these display features.

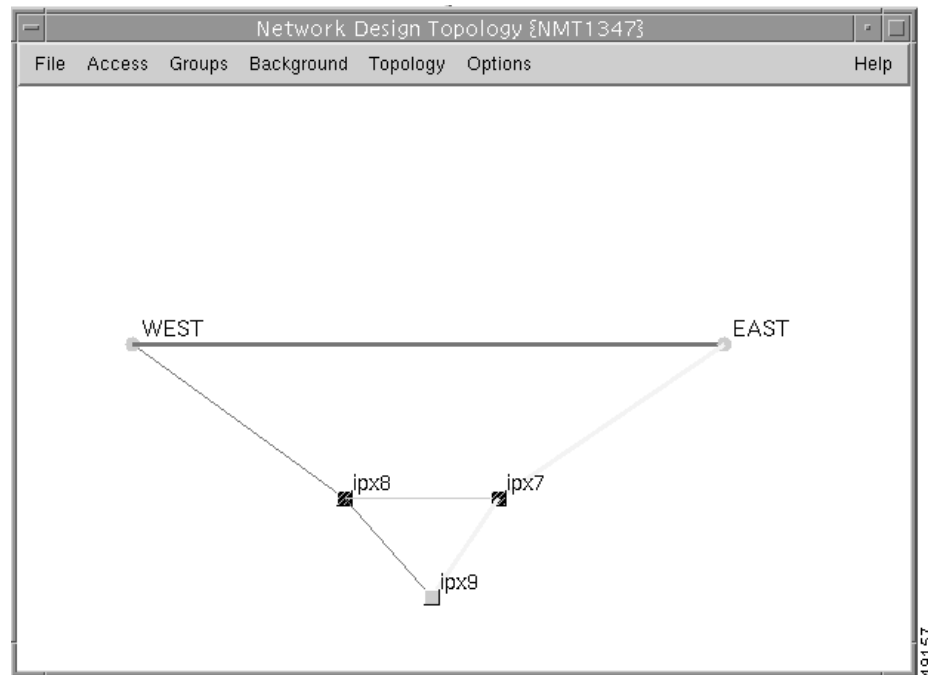
Figure 8-2 Network View Showing Physical Nodes



Navigating Though a Network View

To display a physical network (such as the example in Figure 10-2), click on the group icons. To move down the hierarchy, select an icon and click the left mouse button. The map will now display all the nodes and links in that icon's peer group. Border nodes are shown with cross-hatches on the node icon. (See Figure 8-3.)

Figure 8-3 Two Level Hierarchy - Second Level



To move up the hierarchy, select an icon and click the right mouse button.

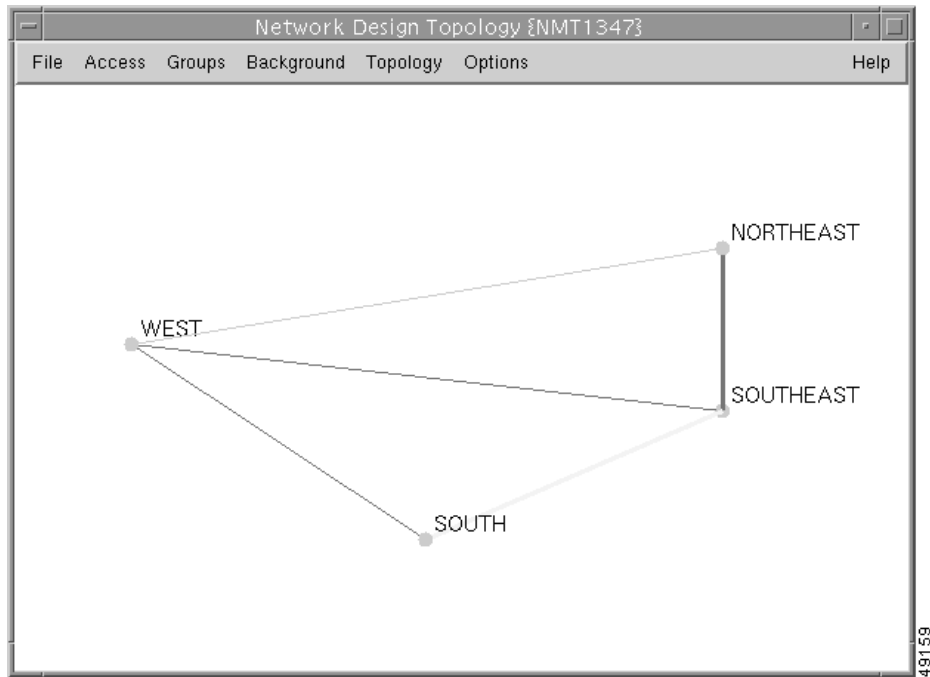


Note

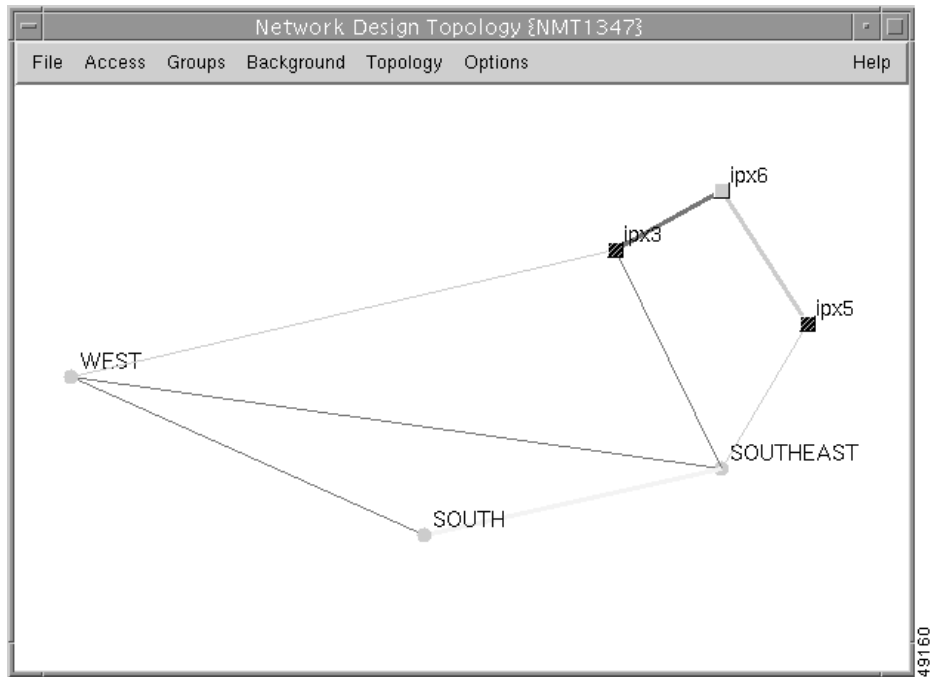
Nodes that do not have map coordinates will appear clumped together in the upper left corner. You must drag them to their proper place on the map.

In a multiple level hierarchy, a left mouse button click on the highest level group icon exposes the next level of logical nodes. Logical nodes are represented by circles.

A left mouse button click on the first level node exposes the second level nodes associated with that node (Figure 8-4).

Figure 8-4 Three Level Hierarchy - Second Level

A left mouse button click on the second level node exposes the third level nodes associated with that node, and so on. (Figure 8-5)

Figure 8-5 Three Level Hierarchy - Third Level**Note**

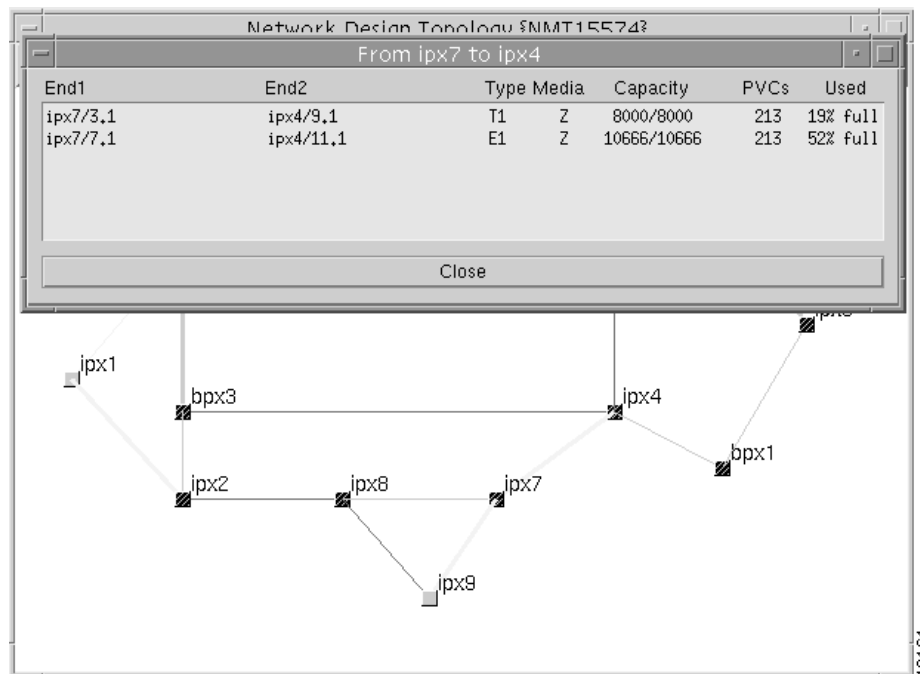
To see the entire network, click on all the logical node icons.

There are two shortcuts to transform [Figure 8-1](#) to [Figure 8-2](#), or vice-versa. Select **Explode** from the **Groups** menu to view the physical network of [Figure 8-2](#), or select **Collapse** from the **Groups** menu to view the logical network ([Figure 8-1](#)).

Obtaining Link Information - Physical Links

Click the link between two physical nodes to display all of the links between them ([Figure 8-6](#)).

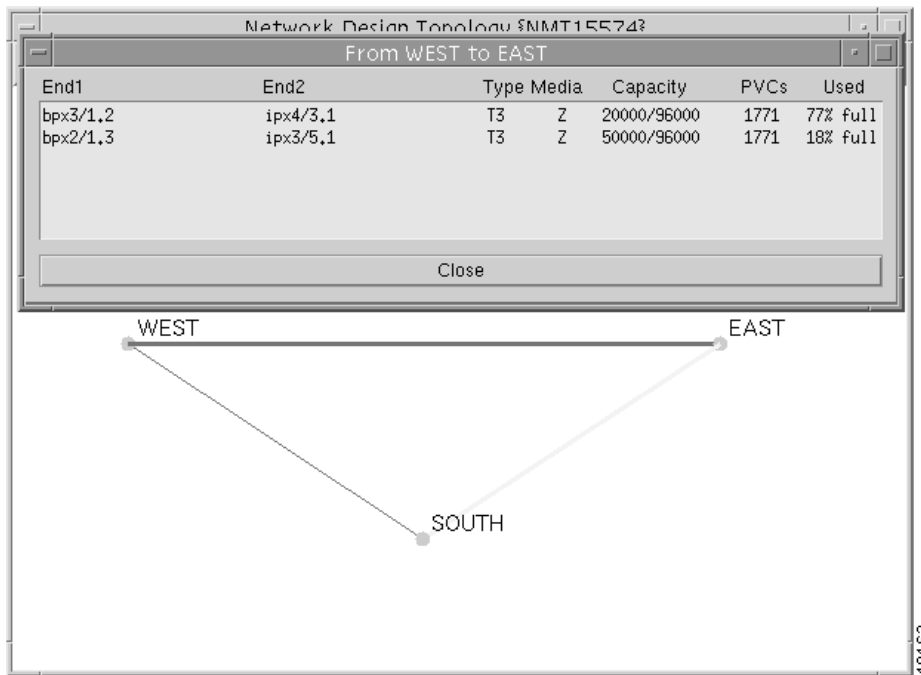
Figure 8-6 Link Display for Physical Links



Obtaining Link Information - Logical Links

Click the logical link between two logical nodes to display all of the physical links between them. All the links are displayed, regardless of how many different node pairs are involved. ([Figure 8-7](#)).

Figure 8-7 Link Display for Logical Links



Zooming the Map

To zoom in on a region of the map, follow these steps:

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- Step 1** Move the cursor to a blank spot on the map above and to the left of the area you wish to enlarge.
 - Step 2** Hold down the left mouse button while dragging the cursor down and to the right. A dotted box appears on the screen.
 - Step 3** Continue moving the cursor until the dotted box surrounds the area you wish to enlarge.
 - Step 4** Release the left mouse button.

The enlarged area now appears in the display.

To return to a map that has been zoomed to its original size, move the cursor to a blank spot on the map and click the right mouse button. The map zooms out, displaying more of the original map area. Continue right-clicking on the map until it returns to original size. It may take as many as 10 clicks to return the map to normal.

Alternatively, selecting a map from the Background menu will also return the display to normal.

Panning the Map

To move a map to a different position on the screen, move the cursor to a blank spot on the screen. Hold down the middle mouse button while dragging the cursor in the direction you want the map to move. When you release the mouse button, the nodes, links, and background map shift in that direction on screen.

To return to the map to its original position, move the cursor to a blank spot on the map and click the right mouse button.

Map Color Coding

The map tool uses color coding to help you recognize important aspects of your network topology. The color coding is described in [Table 8-1](#).

Table 8-1 Network Topology Map Color Coding

Color	Node	Link
Green	Node is functioning normally (all connections have been routed).	Link traffic is below the warning threshold.
Yellow	Node is a hub node, and some of its feeders are not shown.	Link traffic is above the warning threshold but below the critical threshold.
Red	Not all connections at this node could route.	Link traffic exceeds the critical threshold, or link has failed.



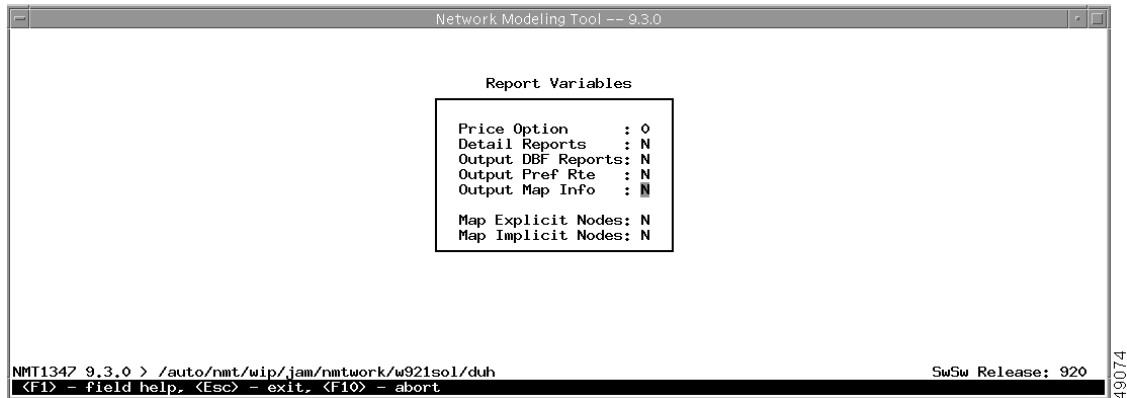
Note

The colors of the logical nodes (groups of nodes) and the links displayed with thick lines (multiple links) are determined by the worst condition of the individual nodes or links that make up the set.

Controlling Map Displays in NMT

Map displays are controlled through the Report Menu in the NMT Main Menu. The Set Options screen contains variables to control map output. ([Figure 8-8](#)).

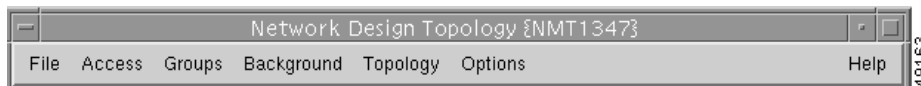
Figure 8-8 NMT Report Menu - Set Options Screen



NMT Map Main Menu

The NMT Map menu bar can contain up to eight pull-down menus for controlling map configuration. (Figure 10-9).

Figure 8-9 NMT Map Main Menu



Each pull-down menu is described in detail below.

- **File** - Contains choices for exiting the map and saving your work.
- **Access** - Contains choices for adding and deleting access feeder nodes to the map display.
- **Groups** - contains choices for viewing networks having groups, adding or deleting groups, and changing the nodes contained in a group.
- **Background** - Contains choices for selecting and displaying background images.
- **Topology**- Contains choices for updating and clearing the map.
- **Options** - Contains selections for coloring the Map display.
- **Messages** -Allows viewing of error messages



Note This menu appears only when there are error or status messages to view.

- **Help** - Contains choices for obtaining information about the map and how to use it.

Each pull-down menu contains one to six submenus. The purpose of each submenu is described in Table 8-2.

Table 8-2 Map Tool Menus

Menu Bar	Selection	Description
File	Save	Save locations of nodes and groups and the assignment of nodes to groups.
	Quit	Exit the map tool, optionally saving or ignoring new information in the display.
Access	Add...	Add an access feeder to the node.
	Delete	Delete an access feeder.
Groups	Explode	Open all groups, displaying individual physical nodes and links.
	Collapse	Aggregate all nodes into their assigned groups, and all groups to their root groups.
	Add new	Add a new group.
	Add to	Add a node or group to a group.
	Delete	Delete a group.
Background	Delete from	Delete a node or group from a group.
	Display	Show or hide a background map.
	Select...	Select the map to display in the background.
Topology	Update Map	Import the latest NMT configuration.
	Clear Map	Clear the map screen.
Options	Thresholds	Sets the color of the links based on their bandwidth percentage utilization.
	Black and White	Shows node names and background map in black on a white background.
Messages	Browse Messages	View any error or status messages. Note This menu item appears only when there are error or status message.
Help	User Guide	Provides information about using the map and the functions of the menu items in the NMT map.
	About...	Describes the map application.



Note

Select Map Tool menus by using the left mouse button, except where noted.

To create a graphical display of the new configuration, perform the following steps:

- Step 1** Choose **Topology** from the menu bar and click on **Update Map** to import the most recent configuration.
- Step 2** Choose **Background** from the menu bar in the Network Design Topology window and click on **Select** to choose a map appropriate to your configuration.
- Step 3** Drag each node to its approximate location on the map. The node icons (colored squares) are stacked in the upper left corner of the window. Place your cursor over a node, hold down the left mouse button, and drag the node into place. Repeat this step for each node.
- Step 4** To save your map, choose **File** from the menu bar and select **Save**.

Adding New Groups

To add a new group, perform the following steps:

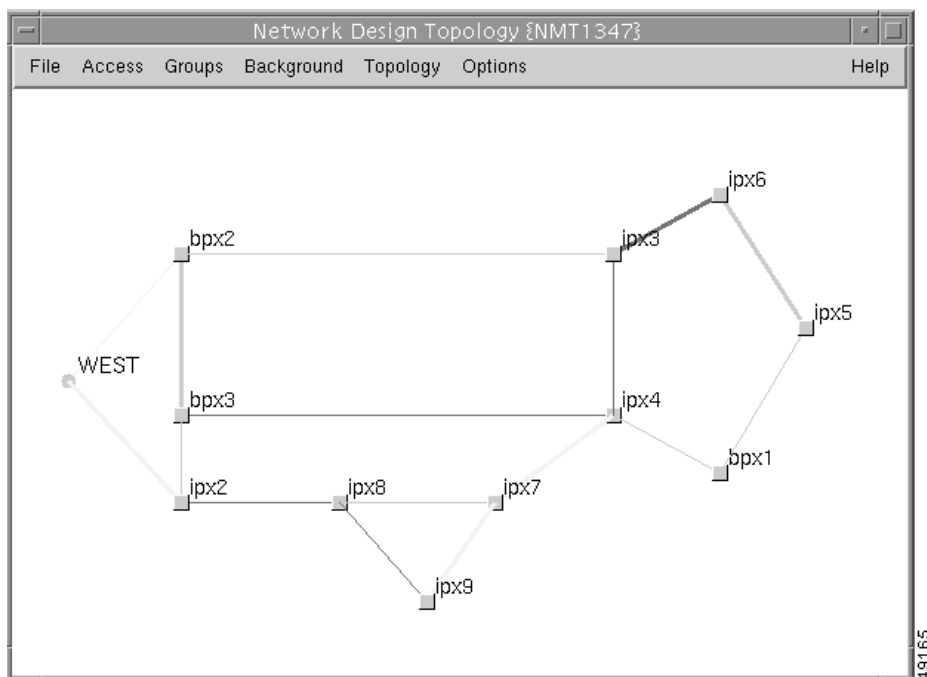
-
- Step 1** Select **Groups** from the Main Menu.
- Step 2** Select **Add new** from the Groups Menu.
- The cursor changes to a large black dot resembling a group icon.
- Step 3** Select a node that will be in the new group. Center the cursor over the node, and click the left or right mouse buttons.
- A dialog box will appear (Figure 8-10).

Figure 8-10 Add Group Dialog



- Step 4** Enter the group name and click **OK**.
- The node name is replaced by the group name, and the node icon is replaced by a group icon (a circle) (See Figure 8-11).
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Figure 8-11 Map Display After Adding a Group

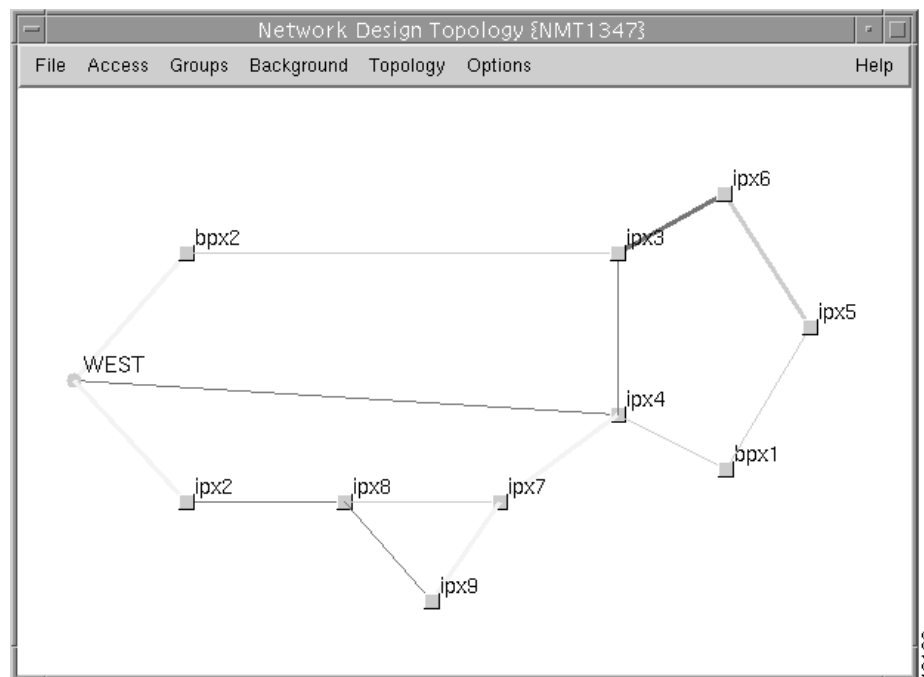


Adding Nodes to Existing Groups

To add a node to existing groups, perform the following steps:

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- Step 1** Select **Groups** from the Main Menu.
 - Step 2** Select **Add** to from the Groups Menu. The cursor changes to a ring, resembling a group icon with a hole in it.
 - Step 3** Select the group to which you want to add a node. Center the cursor over the group icon, and click the left or right mouse buttons. The cursor changes to a square with a dot inside, resembling a node icon.
 - Step 4** Select the first node which you wish to add. Center the cursor over the node icon, and click the left or right mouse buttons. The node disappears, and any links to it terminate at the group icon. (See Figure 10-12.) Continue adding the rest of the nodes to the group in the same manner.
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Figure 8-12 Map Display After Adding a Node to a Group



When you have finished adding all the nodes, shut off this feature by clicking the left or right mouse button on a blank spot on the map, or on the group you are adding to. This shuts off the Add to feature, makes an audible beep, and restores the cursor to an arrow.



Warning

You must shut off the Add To feature before performing any further tasks.



Note

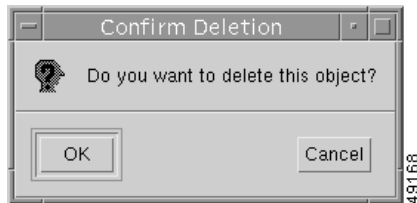
If groups were not defined in NMT, but added in the Map User Interface, only border nodes will only show up on the display when **Update Map** is selected from the Topology Menu.

Deleting Groups

To delete a group, perform the following steps:

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- Step 1** Select **Groups** from the Main Menu.
 - Step 2** Select **Delete** from the Groups Menu. The cursor will change to a skull and crossbones.
 - Step 3** Select the group you want to delete and click the left or right mouse buttons. A dialog box appears (Figure 8-13).
 - Step 4** Click **OK**. The box disappears.

Figure 8-13 Confirm Deletion Dialog Box



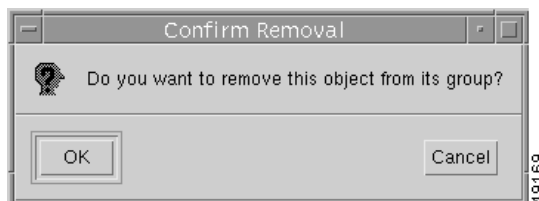
On the map display, the group icon and name disappear, and all the original nodes and links are restored.

Deleting Nodes or Groups from Existing Groups

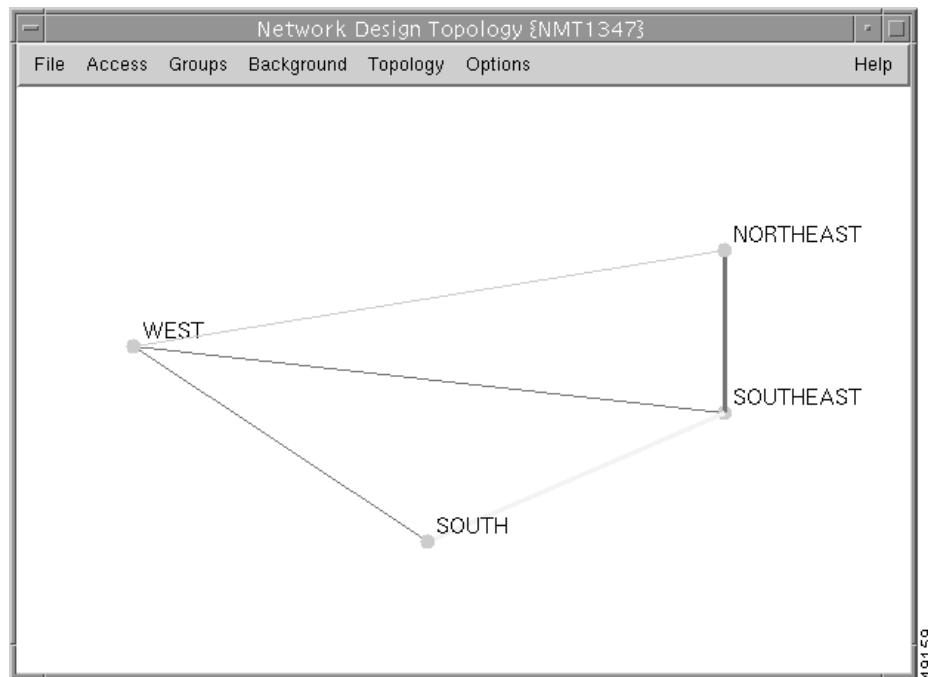
To delete a node or groups from existing groups, perform the following steps:

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- Step 1** Select **Groups** from the Main Menu.
 - Step 2** Select **Delete** from the Groups Menu. The cursor will change to a skull and crossbones.
 - Step 3** Select the group you want to delete and click the left or right mouse buttons. A dialog box appears (Figure 8-14).
 - Step 4** Click **OK**. The box disappears.

Figure 8-14 Confirm Deletion From Group Dialog Box



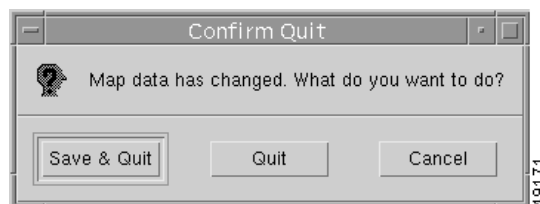
On the map display, nothing appears to happen. However, when you click the right mouse button on a group to navigate up the hierarchy, you hear an audible beep. When you click the right mouse button on other nodes in that group, the map closes the group and displays the next highest logical node. The node you deleted is also displayed because it is no longer a part of the group (Figure 8-15).

Figure 8-15 Map Display after Deleting From a Group

Saving Your Work

There are two ways to save work:

- Select **Utility** from the Main Menu; then select Save from the Utility Menu.
- Select Main Menu<Utility<**Quit**; then select **Save** from the dialog box that appears (Figure 8-16).

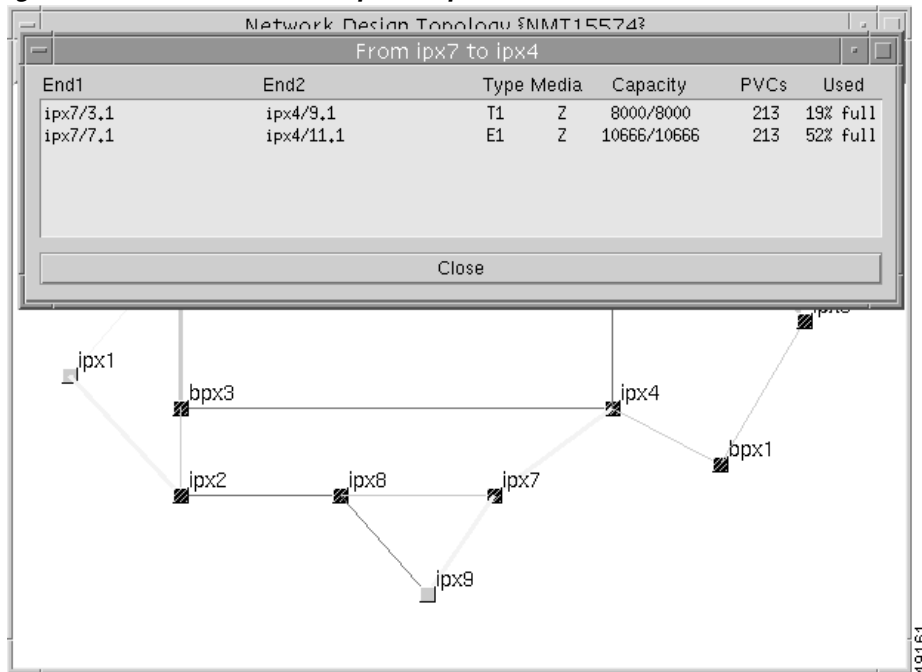
Figure 8-16 Confirm Quit Dialog Box

When you save your work, the NMT map writes the group names and map coordinates into the NMT local config directory.

Retrieving Map Data Into NMT

Once map data has been saved in the map, that data can be imported into NMT. To do this, select **Import<Map Data** from the NMT File Menu (Figure 8-17).

Figure 8-17 NMT File Menu (Import Map Data Screen)



Using the Map Tool with Fail Analysis

After performing a failure analysis, click **Update** in the map window menu bar, and select **Update Map**. Any site that did not reroute a connection for any of the link failures turns red.

Using the Map Tool to Analyze Traffic Levels

Click the Options menu and select **Thresholds**. The Thresholds dialog box contains two sliding bars (Critical and Warning) that allow you to define critical and warning as a percent of total bandwidth. By sliding the bar, you establish the threshold at which the amount of traffic is considered excessive (critical) or close to excessive (warning). The NMT displays excessive traffic in red, close to excessive traffic in yellow, and all other traffic in green.