CHAPTER 10

Creating IPX Requirements and Modifying Router Attributes

This tutorial describes how to create baseline IPX connectivity requirements and modify router IPX attributes for "what-if" simulation. Checking and modifying connectivity requirements can be accomplished using the initial baseline scenario created when a baseline is opened and loaded. However, modifying router attributes for "what-if" simulation requires a new scenario to be created. This step is also described in this tutorial.

The following tasks are performed and described in this tutorial:

- a baseline is opened and loaded
- the baseline's topology is displayed
- end system IPX connectivity requirements are created and applied to the baseline scenario
- the status of the end system IPX connectivity requirements are assessed
- the round trip path is displayed and inspected
- a new scenario is created
- an IPX Network Filter is added to a router interface

Tutorial

Step 1 From the Open Baseline window, select the *tutorial_baseline* baseline. Click on the **OK** button to open and load the baseline.

Refer to "Creating and Opening a Baseline" for information about creating and opening a baseline. In this tutorial, the baseline (*tutorial_baseline*) created in the first tutorial is used. Figure 10-1 shows the Connectivity Tools window after the *tutorial_baseline* baseline was opened and loaded. By default, when a baseline is opened, an initial baseline scenario is created. It has the same name given to the baseline and is displayed and selected in the **Scenarios** list.

Note The Connectivity Tools window's **Requirements** and **Analysis** buttons are not implemented in the Connectivity Baseliner. These button's features are implemented in the Connectivity Solver.

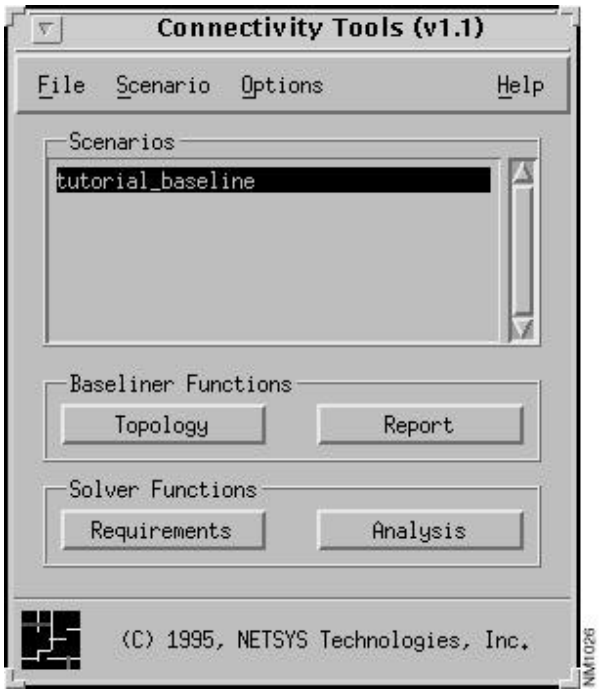

Figure 10-1 Connectivity Tools Window (Solver): Baseline Scenario Created

Step 2 Click on the **Topology** button in the Connectivity Tools window.

The *tutorial_baseline* scenario's topology is displayed in a campus view (the default) in the Topology window.

Step 3 Select the **View>Flat** menu option in the Topology window.

Display the topology in a flat IP view.

Step 4 Select the **Subview>IPX** menu option.

Display only the IPX routes in the topology window.

Step 5 Select the **Show>All Object Labels** menu option.

The network element names and/or address are displayed, as shown in Figure 10-2

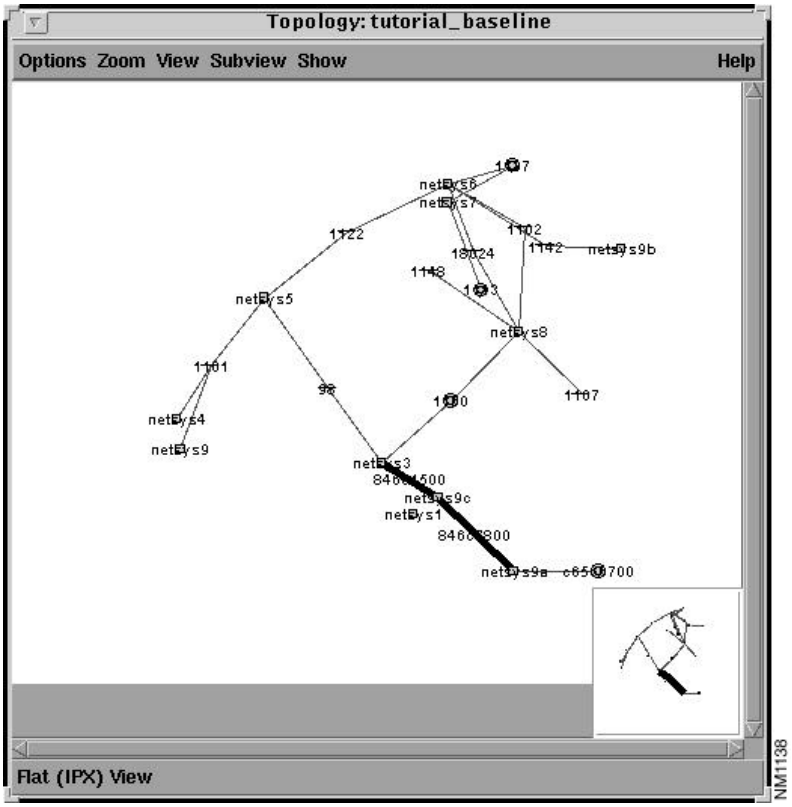

Figure 10-2 Topology Window: Flat IPX View with Labels Displayed

Step 6 Click on the **Requirements** button in the Connectivity Tools window.

The Requirement Sets window, as shown in Figure 10-3, is displayed. The **Requirements** button is used to create, view, load, unload, delete, and undelete end system IPX connectivity requirements.

Figure 10-3 Requirement Sets Window

A list of existing connectivity requirement files is displayed in the **Requirement Files** list.

Requirement File entries preceded by an asterisk indicate connectivity requirements implicitly derived from the router configuration files. These connectivity requirement file sets can not be edited or deleted.

The implicitly derived **Routing Loops** requirement set is provided to find routing loops caused by IP redistribution. When you select the **Routing Loops** requirement set and then load it for analysis by clicking on the **Load** button followed by the **OK** button, a list of all the redistribution IP routing loops detected during analysis is displayed in the Requirements Analysis window. The results are a set of paths showing the identified routing loops. Each path displays a source address set to a port address of a router involved in the loop and a destination, which is a subnet or end point address, identifying the Routing Table destination involved in the routing loop. The path also shows a set of routers involved in a loop.

Step 7 Click on the **New** button.

The New Requirement Set window, shown in Figure 10-4, is displayed. A new set of protocol dependent (in this case IPX) connectivity requirements is created and saved to the file specified in this window.

Step 8 Specify **`ipx_test`** in the **Name** field.

A name must be assigned to the new set of IPX connectivity requirements.

Figure 10-4 New Requirement Set Window

Step 9 Click on the **IPX** button, then click on the **OK** button.

Upon clicking on the **OK** button, the Requirements window is displayed. No entries are defined in the `ipx_test` requirement set, therefore the Requirements pane is empty.

Step 10 Click on the **Add** button in the Requirements window.

The Add IPX Requirements window, partially shown in Figure 10-5, is displayed. You create new requirements in the `ipx_test` requirements set using this window. Allow (**Permit** button selected) an IPX connection from socket `20` of source end system `netsys8.ether1/2.0.es.ipx.1` (`1107.0000.0000.0001`) to socket `30` of destination end system `netsys9a.fddi3/0.0.es.ipx.1` (`c65c6700.0000.0000.0001`).

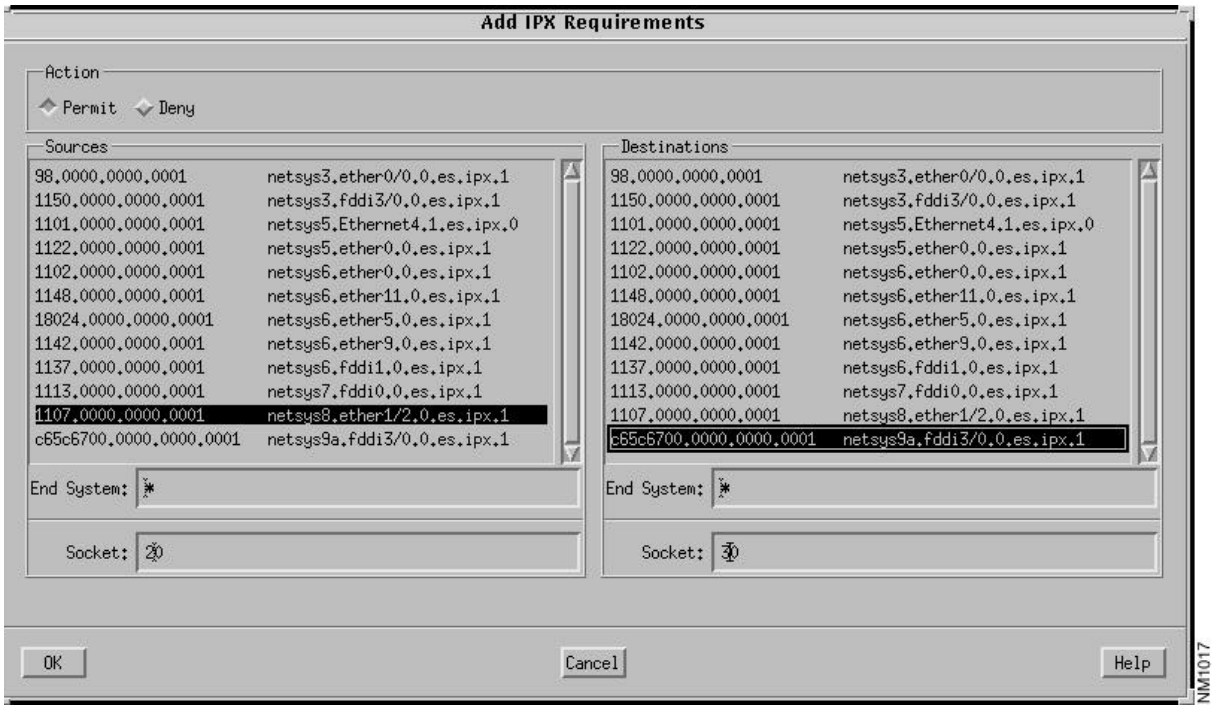

Figure 10-5 Add IPX Requirements Window

Step 11 Click on the **OK** button to add the new requirements you just created to the *ipx_test* file.

The newly defined requirement entry is displayed in the *ipx_test* file's Requirements pane, as partially shown in the modified Requirements window in Figure 10-6.

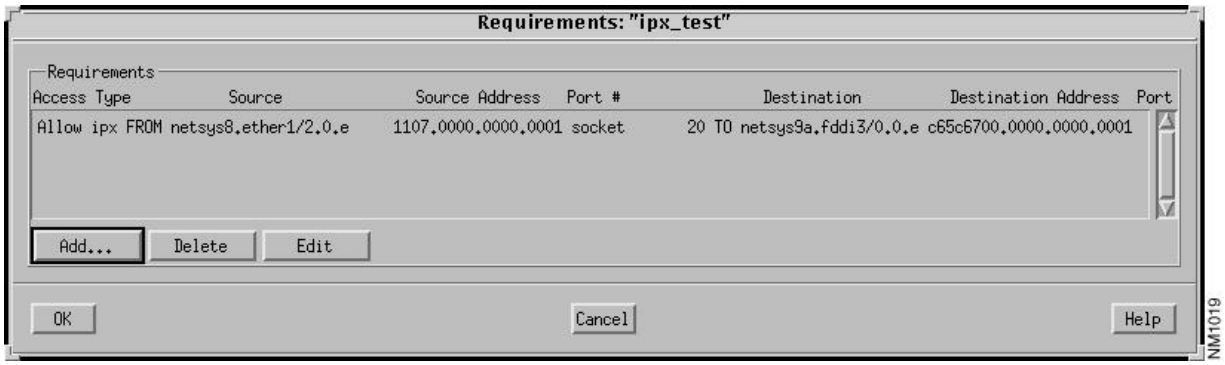

Figure 10-6 New IPX Requirements File Window

Step 12 Click on the **OK** button.

The Requirement Sets window is displayed. The *ipx_test* file set entry is displayed in the Requirement Files list, as shown in Figure 10-7.

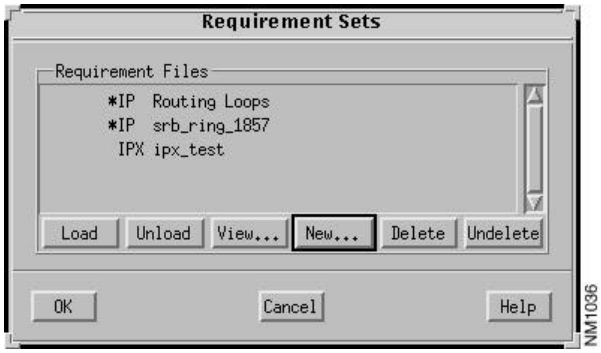

Figure 10-7 Modified Requirement Sets Window

Step 13 Select the newly created *ipx_test* file set entry from the **Requirement Files** list, click on the **Load** button, then click on the **OK** button.

A requirement file set can also be loaded by double-clicking on an entry in the **Requirement Files** list. The *ipx_test* file set is now ready to have connectivity requirements analysis performed. The results of the analysis are viewed from the *tutorial_baseline* Requirements Analysis window, partially shown in Figure 10-8. That is, the status of each connectivity requirement entry loaded for analysis is shown. One existing path was found allowing the connection between the two end systems (`netsys8.ether1/2.0.es.ipx.1` and `netsys9a.fddi3/0.0.es.ipx.1`).

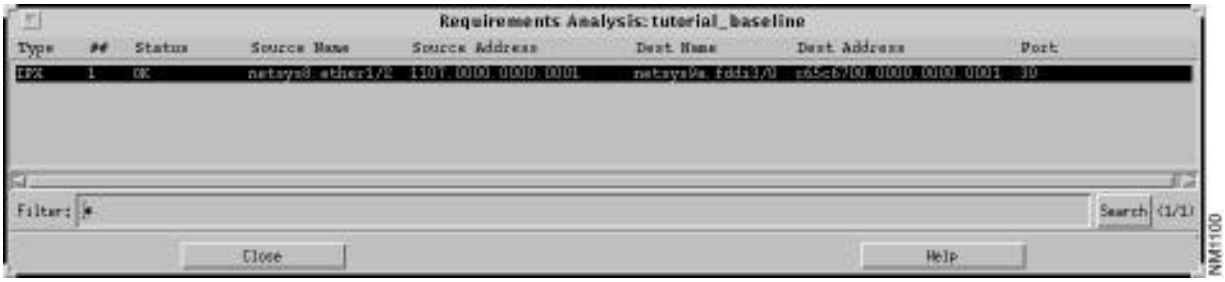

Figure 10-8 IPX Requirements Analysis Window

Step 14 Select the entry in the Requirements Analysis window.

The round trip path between the two end systems is highlighted in the Topology window, as shown in Figure 10-9. The thicker highlighted line represents the path from the source end system to the destination end system. The thinner highlighted line represents the return path from the destination end system to the source end system.

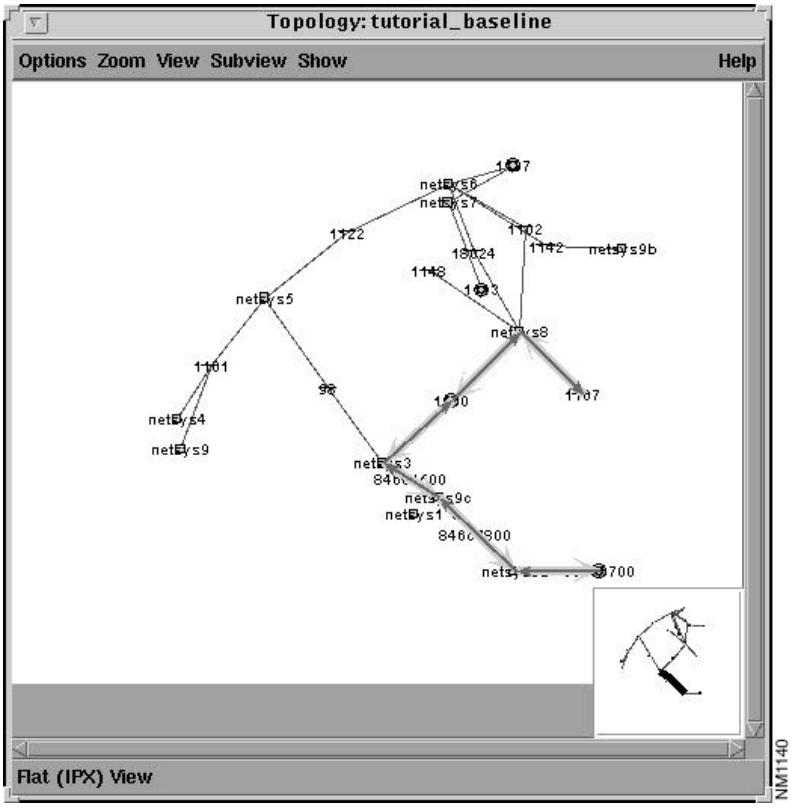

Figure 10-9 Topology Window: IPX Round Trip Path Highlighted

Step 15 Double-click on the selected connectivity requirement entry in the Requirements Analysis window.

A corresponding Round Trip Path window is displayed, as shown in Figure 10-10. This window provides the end system names, addresses, and sockets, the current status of the path, and a list of the devices and network elements that make up the path from the source end system to the destination end system, and back. Selecting an entry in the **Round Trip**

Path list highlights that network component in the Topology window. Based on the information provided in this and the Topology windows, the current IPX connectivity requirements are identified from not only a component standpoint, but visually as well.

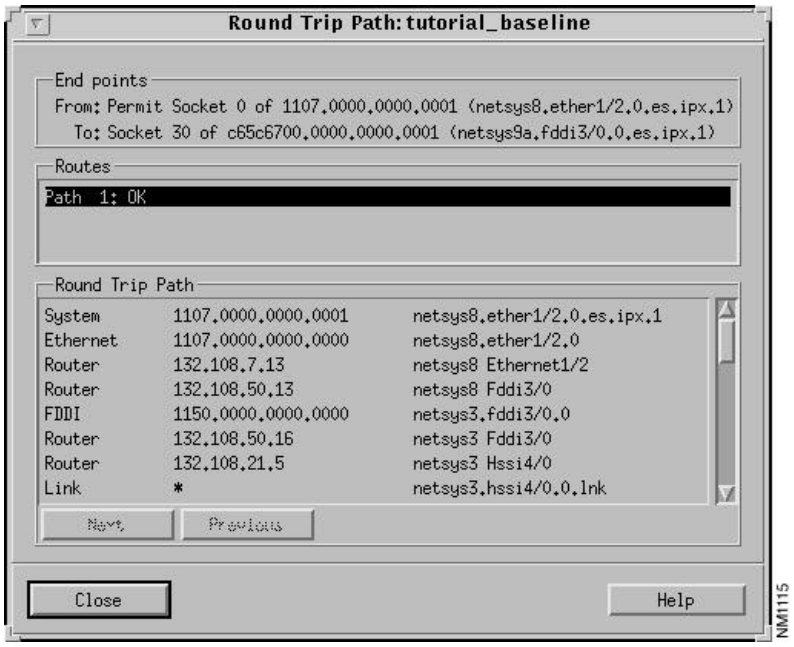

Figure 10-10 IPX Round Trip Path Window

Step 16 Select the **Scenario>Create New** menu option in the Connectivity Tools window.

As you can not use the baseline scenario to modify router attributes, you must create a new scenario (*tutorial_baseline+*). Upon creating the new scenario, the Connectivity Tools window, shown in Figure 10-11, displays the *tutorial_baseline+* scenario in its **Scenarios** list.

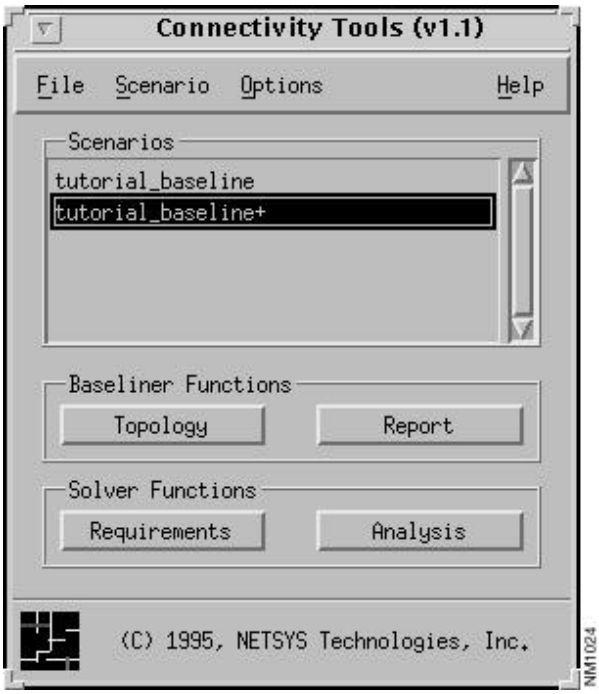

Figure 10-11 Connectivity Tools Window: tutorial_baseline+ Scenario Created

With the new scenario created, alter the current round trip path by applying an IPX network filter to an interface of an intermediate router along the path between the two end systems.

Step 17 Double-click on the **netsys3** router icon in the Topology window.

The **netsys3** Router Configuration window, shown in Figure 10-12, is displayed. You can also double-click on a **netsys3** router entry in the Round Trip Path window or use the Find Device window to display the **netsys3** Router Configuration window.

Note The background color used for the windows associated with this newly created scenario is different than the background color used for the baseline scenario windows. This is true for all subsequently created scenarios as well.

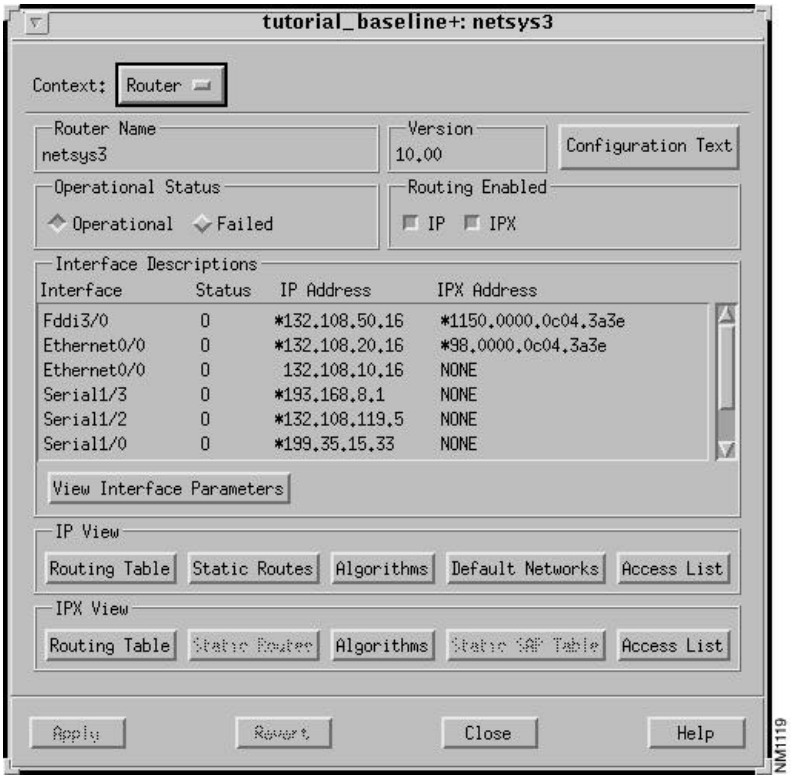

Figure 10-12 Router Configuration Window: netsys3 router

Step 18 Click on the IPX View **Algorithms** button.

The IPX Routing Algorithms window, shown in Figure 10-13, is displayed. RIP is the only IPX routing protocol currently supported in this Connectivity Tools release.

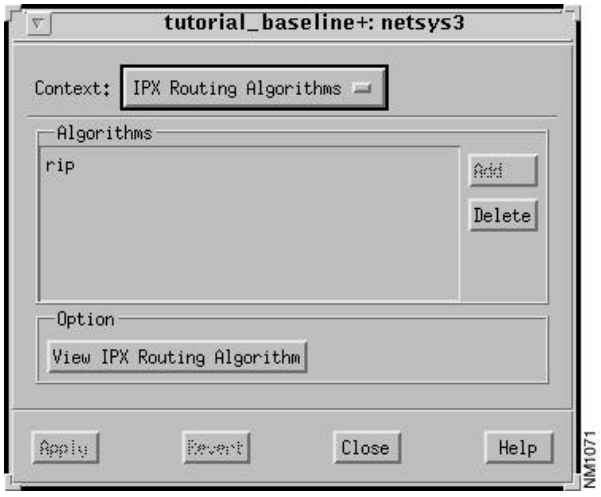

Figure 10-13 IPX Routing Algorithm Window

Step 19 Select the **rip** entry then click on the **View IPX Routing Algorithm** button.

The IPX RIP Routing Algorithm window, shown in Figure 10-14, is displayed.

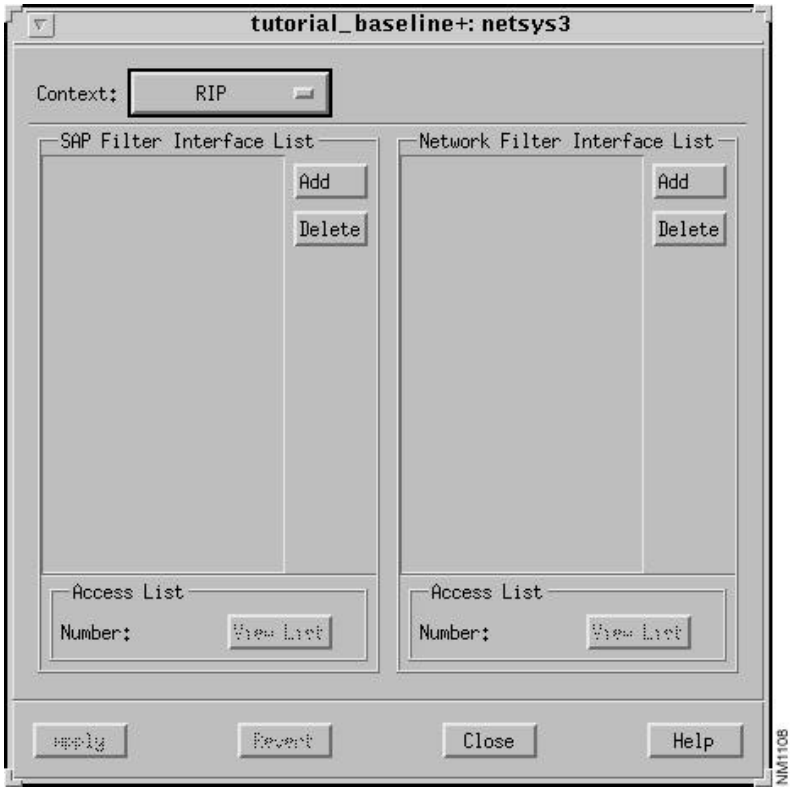

Figure 10-14 IPX RIP Routing Algorithm Window

Step 20 Click on the **Add** button in the **Network Filter Interface List** pane.

The Edit IPX Network Filter List window, shown in Figure 10-15, is displayed. Create a network filter denying routing updates through the **fddi3/0** interface.

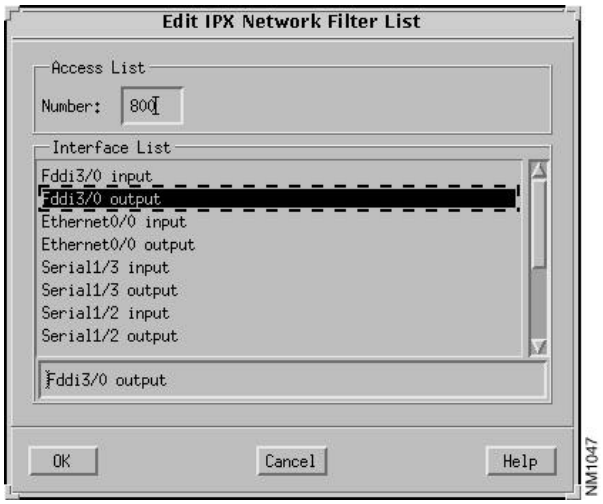

Figure 10-15 Edit IPX Network Filter List Window

Step 21 Specify a standard IPX network filter access list number (**800**) in the **Number** field.

Valid standard IPX network filter access list numbers range from 800 through 899. Valid extended IPX network filter access list numbers range from 900 through 999.

Step 22 Select the **fddi3/0 output** entry from the **Interface List**, then click on the **OK** button.

The IPX network filter is added to the **Network Filter Interface List** in the IPX RIP Routing Algorithm window, as shown in Figure 10-16.

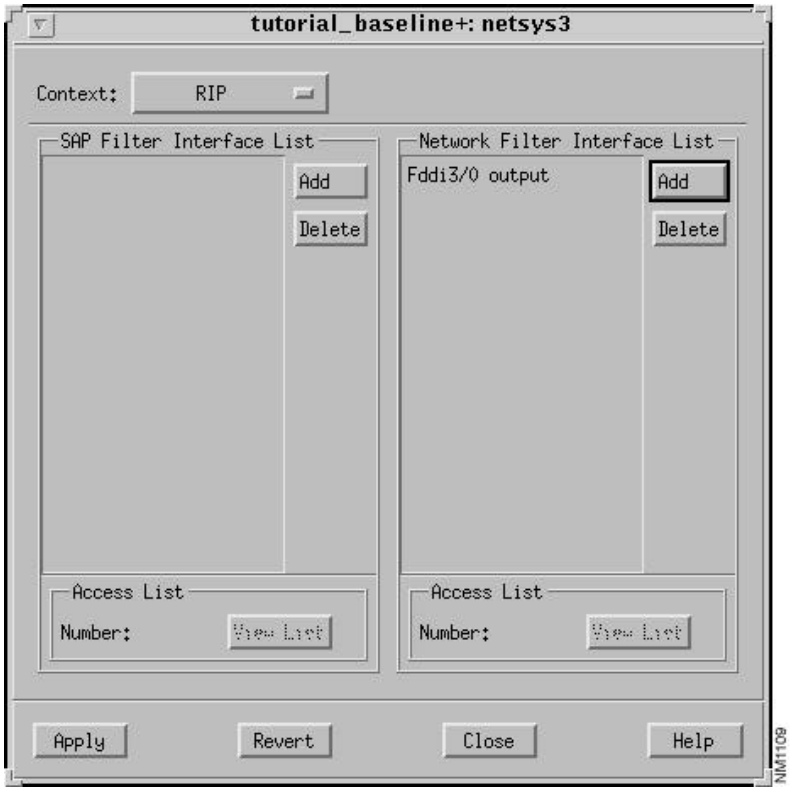

Figure 10-16 Modified IPX RIP Routing Algorithm Window: netsys3 Router

Step 23 Click on the **Apply** button.

The IPX network filter is applied to the current **netsys3** router configuration.

Step 24 Select the new entry in the **Network Filter Interface List**, then click on the **View List** button.

The IPX Network Filter List window is displayed. The network filter parameters are displayed in this window. You are able to add, edit, or delete entries from this network filter access list from this window. You can click on the **Close** button when you are done viewing the network filter parameters to dismiss the IPX Network Filter List window or you can use the **Context** menu to return to a previously displayed window.

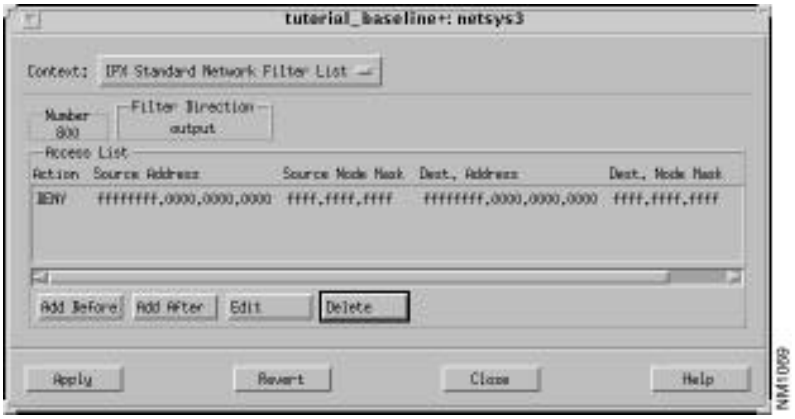

Figure 10-17 IPX Network Filter List Window: netsys3 Router

Step 25 Click on the **Analysis** button in the Connectivity Tools window.

Assess the status of the results in the *tutorial_baseline+* Requirements Analysis window then check the Topology (Figure 10-18) and Round Trip Path windows to see the new, highlighted route taken. Notice the thicker path (source end system to destination end system) has changed its course (it bypasses the **netsys3** router's **fddi3/0** input interface.)

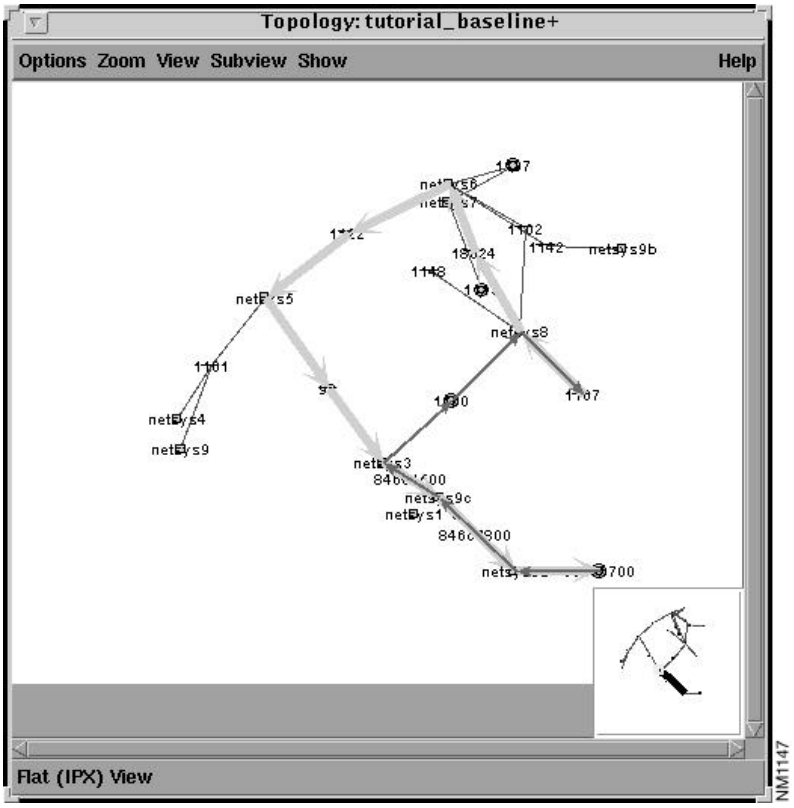

Figure 10-18 Modified Topology Window: Network Filter Applied

Next the IPX route is going to be prevented from using the **netsys5 Ethernet0** output interface. Prior to disabling this interface, first check the IPX Routing Table for the **netsys6** router.

Step 26 Click on the IPX View **Routing Table** button in the **netsys6** Router Configuration window.

The **netsys6** IPX Routing Table window, shown in Figure 10-19, is displayed. Verify the path to the destination router **netsys5 (c65c6700)** exists.

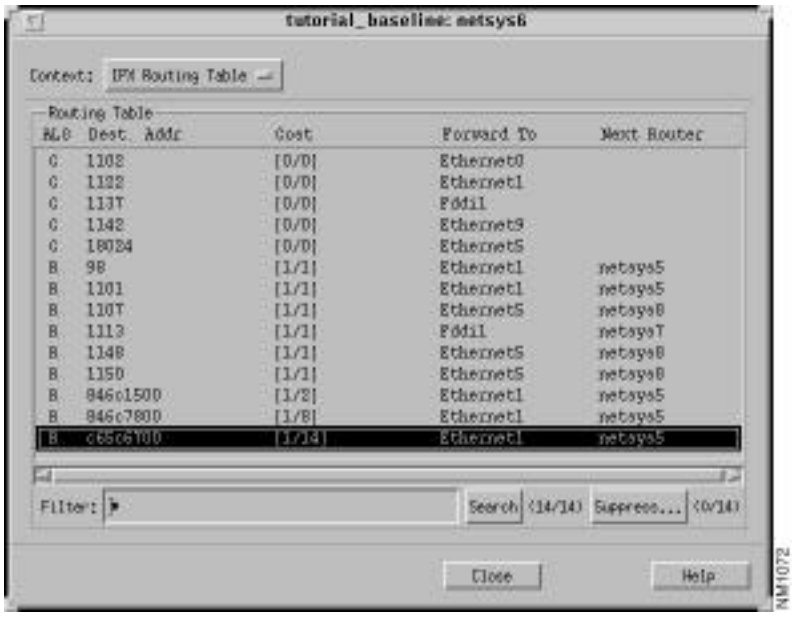

Figure 10-19 IPX Routing Table Window

Step 27 Prevent the IPX connection from coming through the **netsys5** output interface (**Ethernet0**) by applying a network filter on that interface.

Follow the steps described above (for **netsys3)**to prevent the use of the **netsys5 Ethernet0** output interface.

Step 28 Click on the **Apply** button in the IPX RIP Routing Algorithm window.

The network filter is in effect on the **netsys5 Ethernet0** output interface.

Step 29 Click on the **Analysis** button in the Connectivity Tools window.

The *tutorial_baseline+* Requirements Analysis window, partially shown in Figure 10-20, displays information about the current route. Notice the status of the route is listed as `NO ROUTE`.

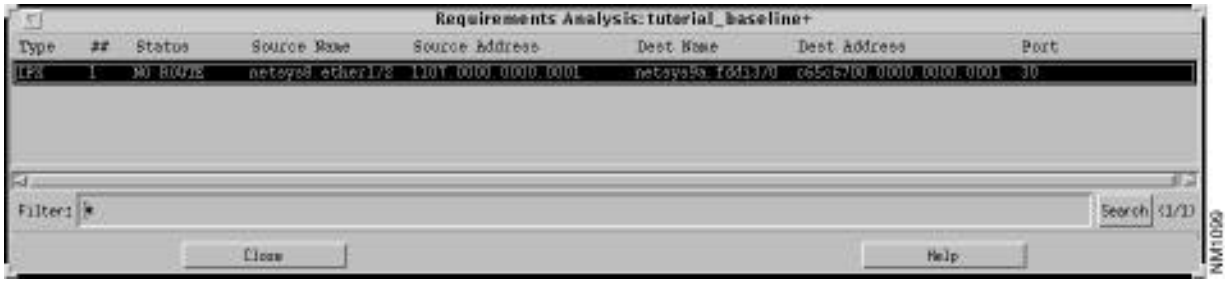

Figure 10-20 Modified Requirements Analysis Window: No Route Available

Step 30 Click on the entry in the Requirements Analysis window.

The Topology window, shown in Figure 10-21, displays the current path between the end systems. Notice a path no longer exists between the source end system and the destination end system. It stops at the **netsys8** router.

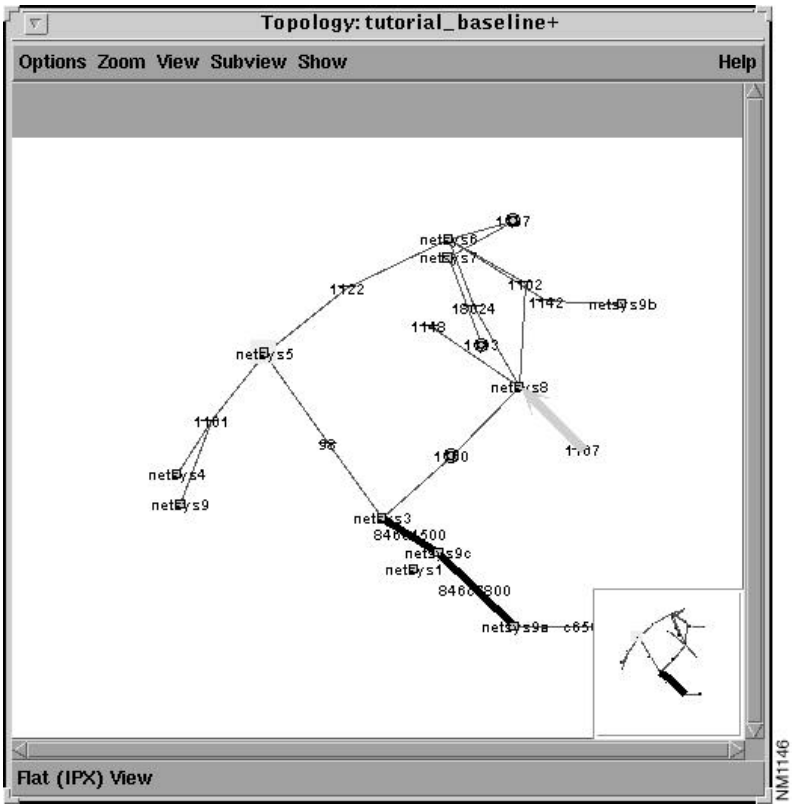

Figure 10-21 Topology Window: No Round Trip Path Available

Step 31 Confirm a route to the destination network **`c65c6700`** no longer exists in the **netsys6** IPX Routing Table.

Figure 10-22 shows the modified **netsys6** Routing Table.

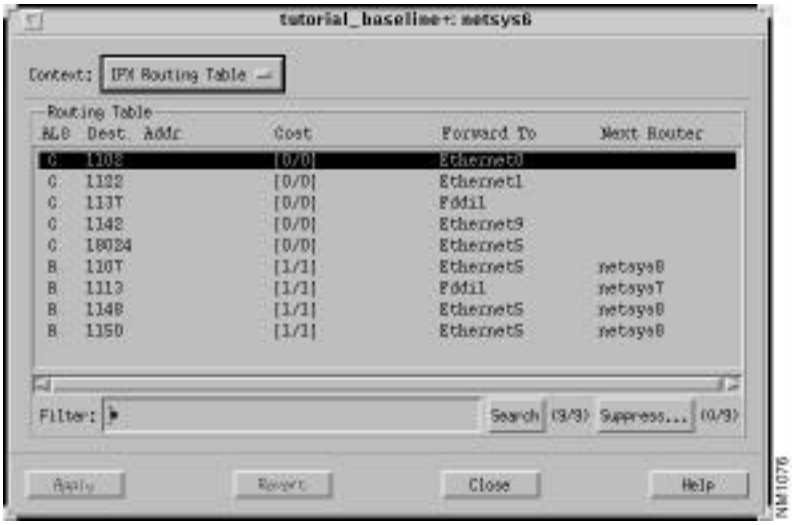

Figure 10-22 Modified netsys6 Routing Table

Step 32 Return to the **netsys5** IPX RIP Routing Algorithm window.

Allow the path to come through the **`Ethernet0`** interface by modifying the existing IPX **Network Filter Interface List** entry.

Step 33 Select the **`Ethernet0 output`** entry in the IPX RIP Algorithm window's **Network Filter Interface List** then click on the Access List **View List** button.

The IPX Network Filter List window is displayed.

Step 34 Click on the **Add Before** button.

The Edit Network Filter Access List window is displayed.

Step 35 Select the **Permit** button and set the Source **Network** and **Node** addresses to the values shown in Figure 10-23.

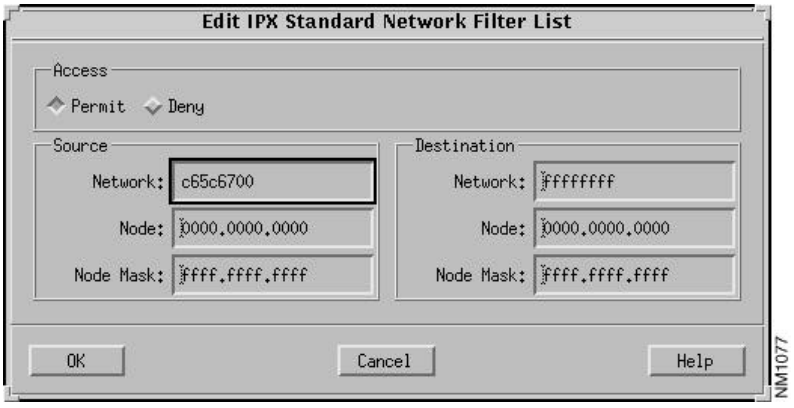

Figure 10-23 Edit Network Filter Access List Window

The new entry is added to the IPX Network Filter List window as shown in Figure 10-24.

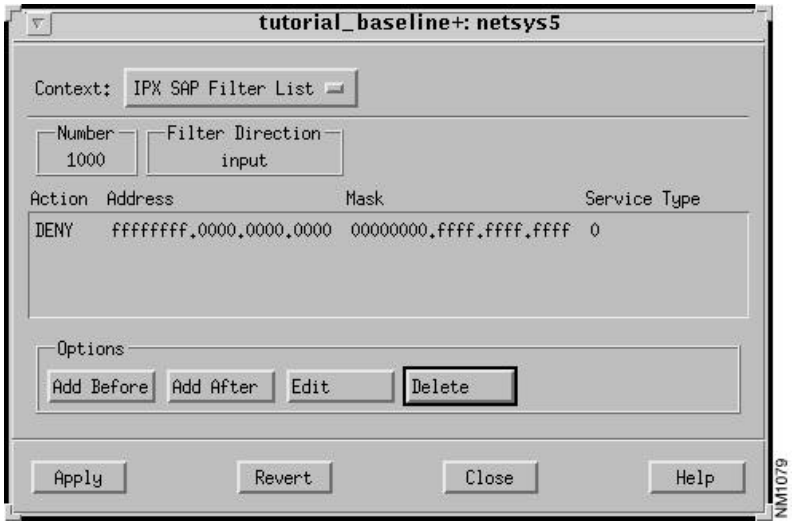

Figure 10-24 Modified IPX Network Filter List Window

Step 36 Click on the **Apply** button.

Step 37 Click on the **Analysis** button in the Connectivity Tools window.

Verify the result from the Requirements Analysis window (a path now exists as partially shown in Figure 10-25) and confirm the result in the Topology and Round Trip Path windows.

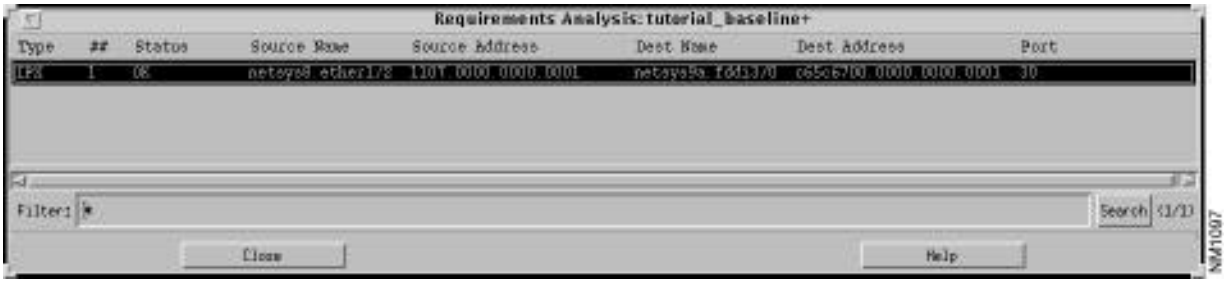

Figure 10-25 Modified Requirements Analysis Window: IPX Path Again Available