CHAPTER 9

IP Configuration Windows

This chapter describes the components of the IP Configuration windows. The IP-related windows are displayed as a result of clicking on IP-related buttons in the Router Configuration window or viewing IP parameters in the Interface Parameters window. As there are numerous IP-related attributes, many windows can be displayed; each window is described in a separate section of this chapter. Where possible, a window that is displayed as a result of an action performed in another window, is described in the subsequent section. The following IP-related windows are described in this chapter:

- IP Interface Parameters
  - Standard IP Access List
  - Edit Standard IP Access List
  - Extended IP Access List
  - Edit Extended IP Access List
  - IP EIGRP Summary Address
  - Edit IP EIGRP Summary Address List
- IP Routing Table
  - IP Suppress Entries
- IP Static Routes
  - Edit IP Static Routes List
- IP Routing Algorithms
  - Edit IP Routing Algorithms List
  - RIP/OSPF/IGRP/EIGRP Algorithm
  - Edit Network List
  - Edit Redistribution List
  - Redistribution (Static/IGRP/EIGRP/OSPF to RIP)
  - Redistribution (Static/OSPF/RIP/IGRP/EIGRP to IGRP/EIGRP)
  - Redistribution (Static/OSPF/RIP/IGRP/EIGRP to OSPF)
  - Redistribution Filter List
  - Edit Redistribution Filter List
  - Edit Passive Interface List
  - Edit Distribution List

  - Distribution Filter List
  - Edit Distribution Filter List
  - Edit Distance List
  - IGRP/EIGRP Algorithm
  - EIGRP Algorithm
- IP Default Networks
  - Edit Default Networks List
- IP Access List Summary

Note The Connectivity Baseliner allows router attributes to be viewed, *not* modified. The Connectivity Solver allows router attributes to be modified as well. Router attribute modification is only possible when using the last scenario in the Connectivity Tools window's Scenarios list. When using any other scenario, including the initial baseline scenario, the attributes may only be *viewed*. It is through the modification of router attributes that "what-if" simulations occur.

General Window Components

The **following** buttons are present in several windows. For brevity, they are described once here.

- Context

  The **Context** button is used as a mechanism for switching the context from one Router Configuration window to or from another. It allows navigation to and from subsequently invoked windows. For example, if you click on the **Routing Table** button in the Router Configuration window, the IP Routing Table window is displayed. Clicking on the **Context** button at this point displays Router and IP Routing Table menu options. Select the Router option to dismiss the IP Routing Table window and display the Router Configuration window.

- **OK** Button

  Click on the **OK** button to apply the changes you have made in the current configuration window and dismiss the window.

- **Cancel** Button

  Click on the **Cancel** button to dismiss the window and cancel the actions that have taken place since the window was displayed or the **OK** button was clicked.

- Help

  Provided you have access to a Mosaic™ or Netscape™ HTML browser, clicking on the **Help** button displays documentation about the corresponding window. The HTML browser specified by the ECSP_HELPVIEWER environment variable is used for this purpose.

- **Apply** Button

  Click on the **Apply** button to apply the changes you have made in the current window. This button is not displayed when using the Connectivity Baseliner or when the initial baseline scenario or a scenario other than the last scenario in the Scenarios list in the Connectivity Tools window is selected.

- **Revert** Button

Click on the **Revert** button to undo the changes made since you last clicked on the **Apply** button. This button is not displayed when using the Connectivity Baseliner or when the initial baseline scenario or a scenario other than the last scenario in the Scenarios list in the Connectivity Tools window is selected.

- **Close** Button

  Click on the **Close** button to dismiss the current window.

- **Add** Button

  Click on the **Add** button to display an associated Edit IP List window. This window is used to add an entry to a list. This button is not displayed when using the Connectivity Baseliner or when the initial baseline scenario or a scenario other than the last scenario in the Scenarios list in the Connectivity Tools window is selected.

- Add **Before** Button

  Click on the **Add Before** button to display an associated Edit IP List window. This window is used to add an entry one position prior to the currently selected entry in the list. If an entry in the list is not selected prior to clicking on this button, the new entry is added to the beginning of the list. This button is not displayed when using the Connectivity Baseliner or when the initial baseline scenario or a scenario other than the last scenario in the Scenarios list in the Connectivity Tools window is selected.

- Add **After** Button

  Click on the **Add After** button to display an associated Edit IP List window. This window is used to add an entry one position after the currently selected entry in the list. If an entry in the list is not selected prior to clicking on this button, the new entry is added to the bottom of the list. This button is not displayed when using the Connectivity Baseliner or when the initial baseline scenario or a scenario other than the last scenario in the Scenarios list in the Connectivity Tools window is selected.

- **Edit** Button

  Click on the **Edit** button to display an associated Edit IP List window. This window is used to modify an existing List entry. An existing List entry must be selected prior to clicking on this button.

- **Delete** Button

  Click on the **Delete** button to delete a selected entry from a list or table.

IP Interface Parameters Window

The IP Interface Parameters window, shown in Figure 9-1, is displayed when you click on the **IP** button in the Interface Parameters window's View Parameters pane. The Interface Parameters window allows you to assign IP input and output access lists to the selected router interface, to turn on or off the split horizon feature, and to set EIGRP summary address attributes.

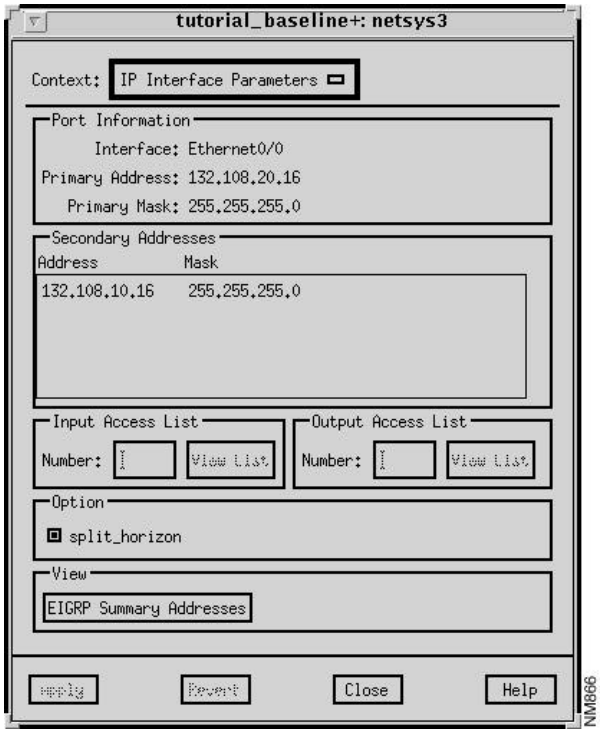

Figure 9-1 IP Interface Parameters Window

IP Interface Parameters Window Components

This window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Apply**, **Revert**, **Close**, and **Help** buttons.

Port Information - Interface

The router's symbolic interface name, as specified by the **interface** command in the router configuration file, is displayed in this field. For example, the **Interface** entry `Ethernet1/0` corresponds to an Ethernet interface using the Cisco Series 7000 backplane slot number 1, port number 0.

Port Information - Primary Address

The primary IP address of the interface as specified by the **ip address** interface subcommand in the router configuration file, is displayed in dotted-decimal format.

Port Information - Primary Mask

The primary IP network mask of the interface as specified by the **ip address** interface subcommand in the router configuration file, is displayed in dotted-decimal format.

Secondary Addresses - Address

The secondary IP address of the interface as specified by the **ip address** interface subcommand and **secondary** option in the router configuration file, is displayed in dotted-decimal format.

Secondary Addresses - Mask

The secondary IP network mask of the interface as specified by the **ip address** interface subcommand and **secondary** option in the router configuration file, is displayed in dotted-decimal format.

Input Access List - Number

Specify a number to be assigned to a standard or extended IP input access list for the selected interface, then press **Return**. If already defined in the configuration, it is displayed automatically. Click on the **Apply** button to assign the access list number to the input access list. At this point the Input Access List **View List** button is activated. Valid standard IP access list numbers range from 1 through 99. Valid extended IP access list numbers range from 100 through 199.

Input Access List - View List Button

Click on this button to switch the context from the IP Interface Parameters window to one of the IP Access List windows. An input access list number must be selected and entered in the **Input Access List Number** field for the context switch to occur. If a standard IP access list number is specified (1 through 99), see “Standard IP Access List Window Components” for a detailed description of the Standard IP Access List window components. If an extended access list number is specified (100 through 199), see “Extended IP Access List Window Components” for a detailed description of the Extended IP Access List window components.

Output Access List - Number

Specify a number to be assigned to a standard or extended IP output access list for the selected interface, then press **Return**. If already defined in the configuration, it is displayed automatically. Click on the **Apply** button to assign the access list number to the output access list. At this point the Output Access List **View List** button is activated. Valid standard IP access list numbers range from 1 through 99. Valid extended IP access list numbers range from 100 through 199.

Output Access List - View List Button

Click on this button to switch the context from the IP Interface Parameters window to one of the IP Access List windows. An output access list number must be selected and entered in the **Output Access List Number** field for the context switch to occur. If a standard IP access list number is specified (1 through 99), see “Standard IP Access List Window Components” for a detailed description of the Standard IP Access List window components. If an extended access list number is specified (100 through 199), see “Extended IP Access List Window Components” for a detailed description of the Extended IP Access List window components.

Option - split_horizon Button

Click on the **split_horizon** button to turn on/off the split horizon feature. The split horizon mechanism is used by routers connected to broadcast-type IP networks using distance vector routing protocols to prevent routing loops. Enabling split horizon blocks information pertaining to routes from being advertised by a router out any interface from which that information originated. It is recommended to *not* use the split horizon feature in nonbroadcast networks. Enabled is the default setting.

View - EIGRP Summary Addresses Button

Click on this button to switch the context from the IP Interface Parameters window to the IP EIGRP Summary Addresses window. You can configure a summary aggregate address for this interface. If there are any more specific routes in the Routing Table, IP EIGRP advertises the summary address out the interface with a metric value equal to the minimum of all more specific routes. See "IP EIGRP Summary Address Window Components" for a detailed description of the IP EIGRP Summary Addresses window components.

Standard IP Access List Window Components

The Standard IP Access List window, shown in Figure 9-2, is displayed when you specify a standard access list number in the **Number** field, press Return, click on the **Apply** button, and then click on the **View List** button in the IP Interface Parameters window. This window allows you to view, add, edit, and delete entries associated with the specified standard access list. The window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Add Before**, **Add After**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add Before**, **Add After**, and **Edit** buttons displays the Edit Standard IP Access List window. You can select a specific entry in the access list prior to clicking on the **Add Before**, **Add After**, or **Edit** buttons. See "Edit Standard IP Access List Window Components" for a detailed description of the window's components.

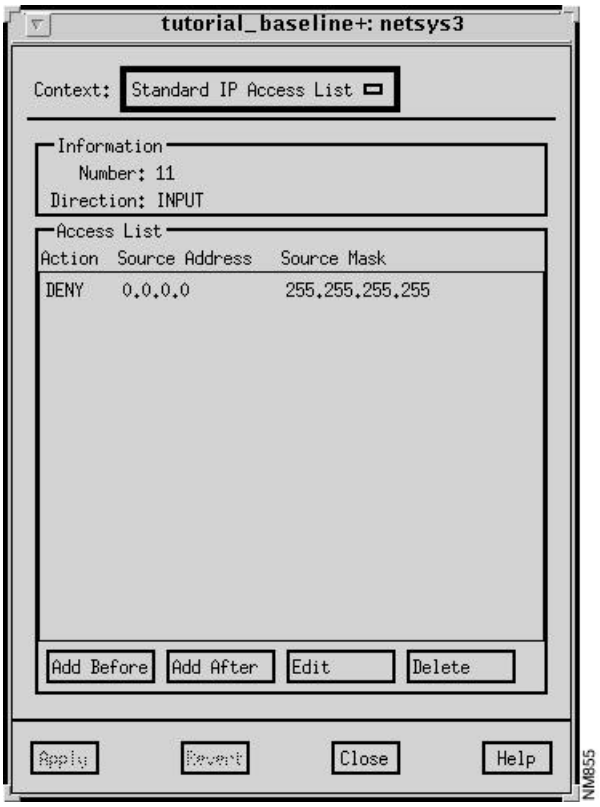

Figure 9-2 Standard IP Access List Window

Information - Number

The standard IP access list number to be assigned to the selected interface is displayed in this field. Valid standard IP access list numbers range from 1 through 99.

Information - Direction

The filter direction (`INPUT` or `OUTPUT`) of this standard IP access list for the selected interface is displayed in this field.

Access List

This pane lists the selected standard IP access list entry values. An entry contains the action (`PERMIT`/`DENY`), source address, and source mask values. These values are described in detail in the following section.

Edit Standard IP Access List Window Components

The Edit Standard IP Access List window, shown in Figure 9-3, is displayed when you click on the **Add Before**, **Add After**, or **Edit** buttons in the standard IP Access List window. This window allows you to add or modify a standard IP access list entry. Standard IP access list numbers range from 1 through 99.

This window's components are described in the following sections. See "General Window Components" for a description of the **OK**, **Cancel**, **Help** buttons.

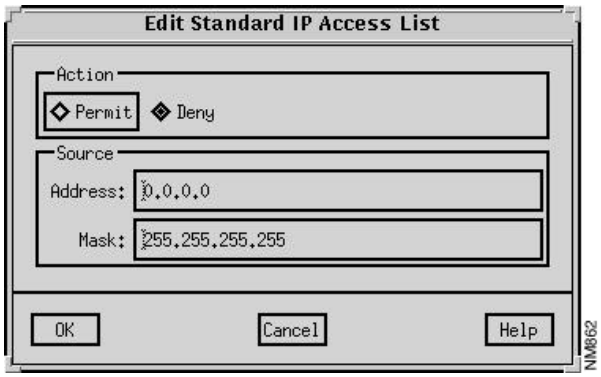

Figure 9-3 Edit Standard IP Access List Window

Action - Permit/Deny Buttons

Select the **Permit** button to allow access from the specified source network and node addresses. Select the **Deny** button to block access from the specified source network and node addresses.

Source - Address

Specify a valid IP address as the source address, in dotted-decimal format, in this field.

Source - Mask

Specify an IP address mask, in dotted-decimal format, signifying the bits in the source address to be ignored, in this field.

Extended IP Access List Window Components

The Extended IP Access List window, shown in Figure 9-4, is displayed when you have specified an extended access list number in the **Number** field and then clicked on the **View List** button in the IP Interface Parameters window. This window allows you to view, add, edit, and delete entries associated with the specified extended IP access list. Extended IP access list numbers range from 100 through 199.

This window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Add Before**, **Add After**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add Before**, **Add After**, and **Edit** buttons displays the Edit Extended IP Access List window. You can select a specific entry in the IP access list prior to clicking on the **Add Before**, **Add After**, or **Edit** buttons. See "Edit Extended IP Access List Window Components" for a detailed description of the window's components.

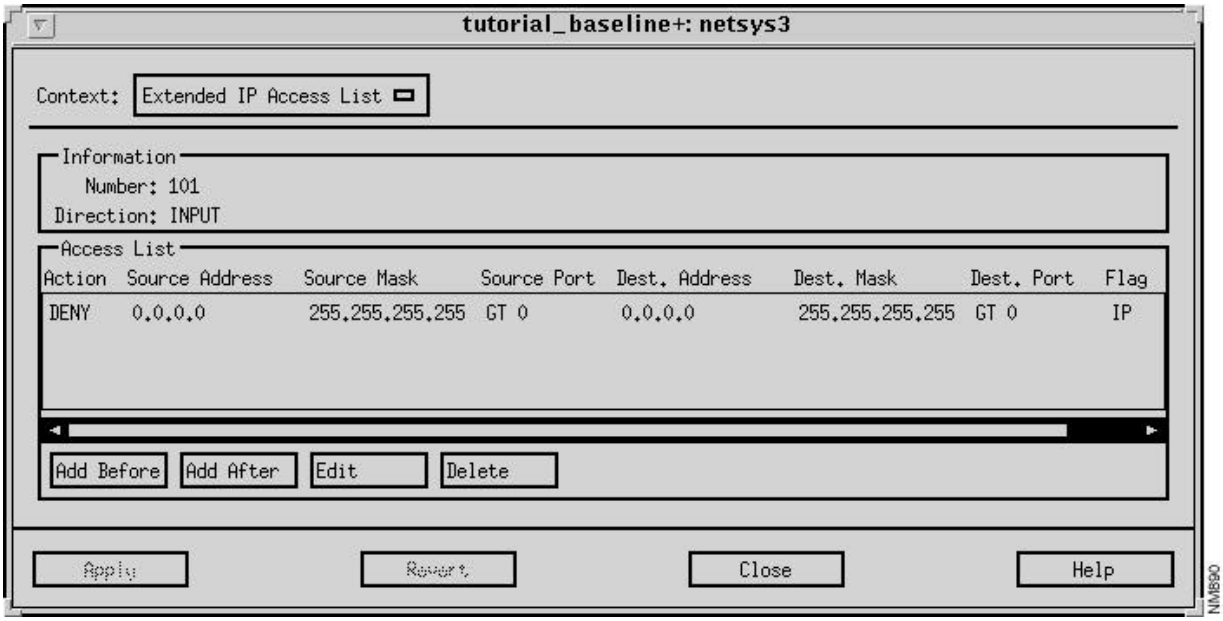

Figure 9-4 Extended IP Access List Window

Information - Number

The extended IP output access list number assigned to the selected interface is displayed in this field. Valid extended IP access list numbers range from 100 through 199.

Information - Direction

The filter direction for the selected router interface (`INPUT` or `OUTPUT`) is displayed in this field.

Access List

This pane lists the selected extended IP Input access list entry values. An entry contains the action (`PERMIT`/`DENY`), the source IP address, source IP mask, source port, destination IP address, destination IP mask, destination port, and flag values. These values are described in detail in "Edit Extended IP Access List Window Components."

Edit Extended IP Access List Window Components

The Edit Extended IP Access List window, shown in Figure 9-5, is displayed when you click on the **Add Before**, **Add After**, or **Edit** buttons in the Extended IP Access List window when using IOS 10.2 or earlier. When using IOS 10.3, a Source Port filter and equation values are also included. This window allows you to add or modify an extended access list entry. The window's components are described in the following sections. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

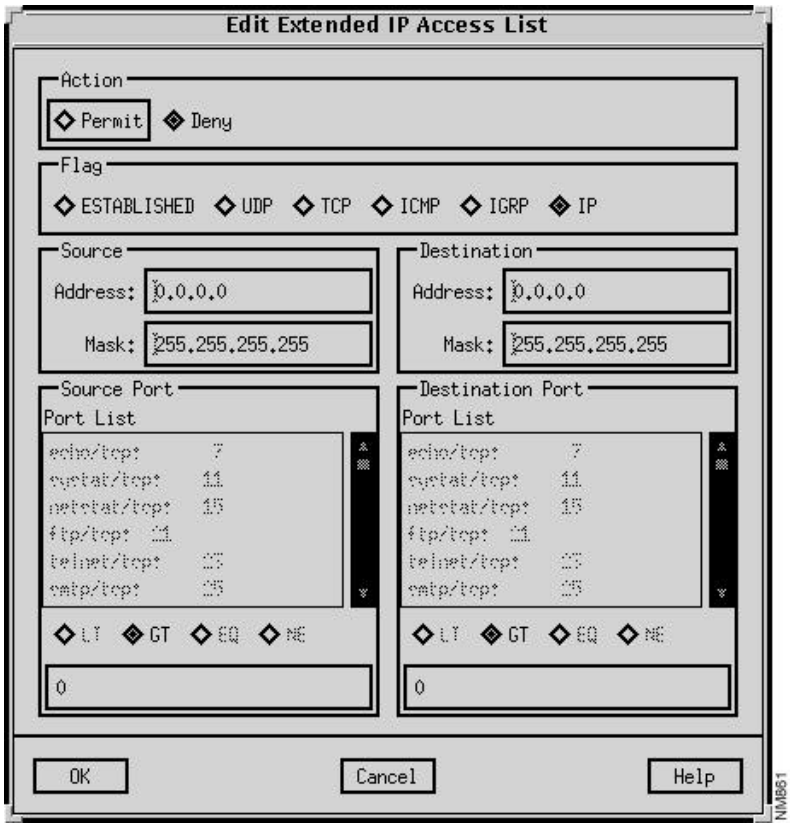

Figure 9-5 Edit Extended IP Access List Window

Action - Permit/Deny Buttons

Select the **Permit** button to permit access from the specified source network and node address(es) and port number to the specified destination network and network node address(es) and port number. Select the **Deny** button to deny access from the specified source network and node address(es) and port number to the specified destination network and network node address(es) and port number. Deny is the default setting.

Flag

Click on one of the **following** buttons to select the desired transport protocol:

- ESTABLISHED - indicates an established TCP/IP connection
- UDP - use the User Datagram Protocol
- TCP - use the Transmission Control Protocol
- ICMP - use the Internet Control Message Protocol
- IGRP - use the Interior Gateway Routing Protocol
- IP - use the Internet Protocol (default selection)

Selecting an ESTABLISHED, ICMP, IGRP, or IP flag automatically sets the port field to greater than zero (GT is selected.) This default setting can not be overridden. Selecting one of these flags values also deactivates the Source Port and Destination Port panes.

Source - Address

Specify a valid IP address as the source address, in dotted-decimal format, in this field.

Source - Mask

Specify an IP address mask signifying the bits in the source address to be ignored, in dotted-decimal format, in this field.

Source Port - Port List

Select a transmission protocol to use to send packets over the source router port from the list in this pane. The corresponding port number is displayed next to the entries. Selecting an entry from the list automatically selects the UDP or TCP flag. Selecting an ESTABLISHED, ICMP, IGRP, or IP flag deactivates the Source Port pane. The **EQ** source equation button is also automatically selected. Clicking on another destination equation value overrides the EQ setting.

Note This pane is displayed only when the associated router's configuration file has an IOS version number of 10.3.

Source Equation Values

Click on an equation value (**LT** (less than), **GT** (greater than), **EQ** (equal to), **NE** (not equal to)) button to set the source port equation value.

Note This pane is displayed only when the associated router's configuration file has an IOS version number of 10.3.

Destination - Address

Specify a valid IP address as the destination address, in dotted-decimal format, in this field.

Destination - Mask

Specify an address mask signifying the bits in the destination address to be ignored, in dotted-decimal format, in this field.

Destination Port - Port List

Select a transmission protocol to use to send packets to the destination router port from the list in this pane. The corresponding port number is displayed next to the entries. Selecting an entry from the list automatically selects the UDP or *TCP* flag. Selecting an ESTABLISHED, ICMP, IGRP, or IP flag deactivates the Destination Port pane. The **EQ** source equation button is also automatically selected. Clicking on another destination equation value overrides the **EQ** setting.

Destination Equation Values

Click on an equation value (**LT** (less than), **GT** (greater than), **EQ** (equal to), **NE** (not equal to)) button to set the destination port equation value.

IP EIGRP Summary Address Window Components

The IP EIGRP Summary Address window is displayed when you click on the View **EIGRP Summary Addresses** button in the IP Interface Parameters window. The IP EIGRP Summary Address window allows you to add, edit, and delete entries in the IP EIGRP summary address list. A summary aggregate address for this interface can be configured. If there are any more specific routes in the Routing Table, IP EIGRP advertises the summary address out the interface with a metric value equal to the minimum metric associated with all of the specific routes. This command works in conjunction with the EIGRP auto summary feature. If auto-summary is in effect, there is no need to configure network level summaries. The EIGRP summary addresses are ignored. See "EIGRP Option - Auto-Summary" for information about the EIGRP auto summary feature.

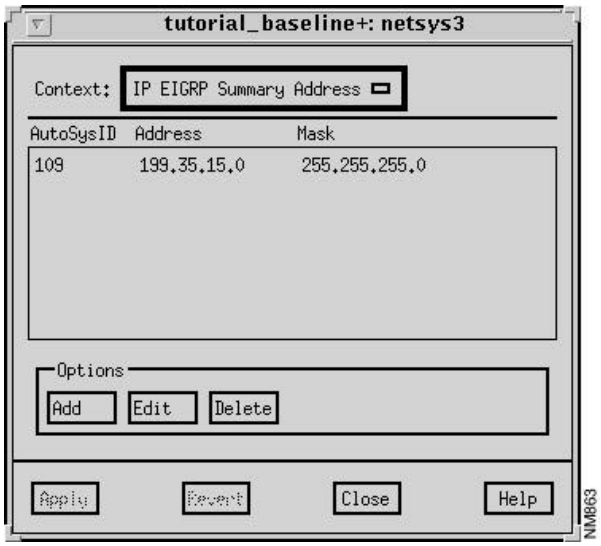

Figure 9-6 IP EIGRP Summary Address Window

This window's summary address components are described below. See "General Window Components" for a description of the **Context**, **Add**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add** and **Edit** buttons displays the Edit IP EIGRP Summary Address List window. You can select a specific entry in the EIGRP Summary Address list prior to clicking on the **Add** or **Edit** buttons. See "Edit IP EIGRP Summary Address List Window Components" for a detailed description of the window's components.

AutoSysID/Address/Mask

The Autonomous System IDs and their associated IP addresses and IP address masks are listed in this pane. An autonomous system is a collection of interconnected routers under common management control, or similar routing policies and requirements. Typically, an autonomous system

consists of routers connecting multiple IP networks. Autonomous System IDs *must* be assigned to the IGRP, EIGRP, and OSPF routing protocols. Routers originating from one autonomous system that need to be advertised into other autonomous systems must be redistributed.

Edit IP EIGRP Summary Address List Window Components

The Edit IP EIGRP Summary Address window, shown in Figure 9-7, is displayed when you click on the **Add** or **Edit** buttons in the IP EIGRP Summary Address window. This window allows you to add or edit IP EIGRP summary address list entries. The window's components are described in the following sections. See "General Window Components" for a description of the **OK**, **Cancel**, **Help** buttons.

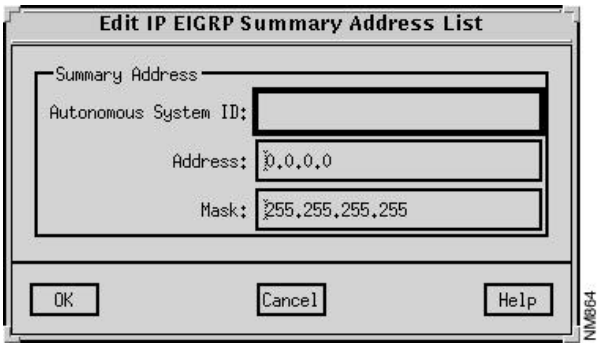

Figure 9-7 Edit IP EIGRP Summary Address List Window

Summary Address - Autonomous System ID

The autonomous system ID is specified in this field. An autonomous system is a collection of interconnected routers under common management control, or similar routing policies and requirements. Typically, an autonomous system consists of routers connecting multiple IP networks.

Summary Address - Address/Mask

The IP address and IP address mask, in dotted-decimal format, are specified in these fields.

IP Routing Table Window

The IP Routing Table window, partially shown in Figure 9-8, is displayed when you click on the IP **Routing Table** button in the Router Configuration window. The IP Routing Table window displays the IP Routing Table entries configured for the router (`netsys3` in this example.) This table is initially constructed from the information contained in the baseline router configuration files. Routing Tables generated during subsequent "what-if" scenarios also take into account the attributes that have been modified within those scenarios. IP Routing Table entries may not be edited from this window. Double-clicking on an IP Routing Table entry highlights the next hop router in the Topology window.

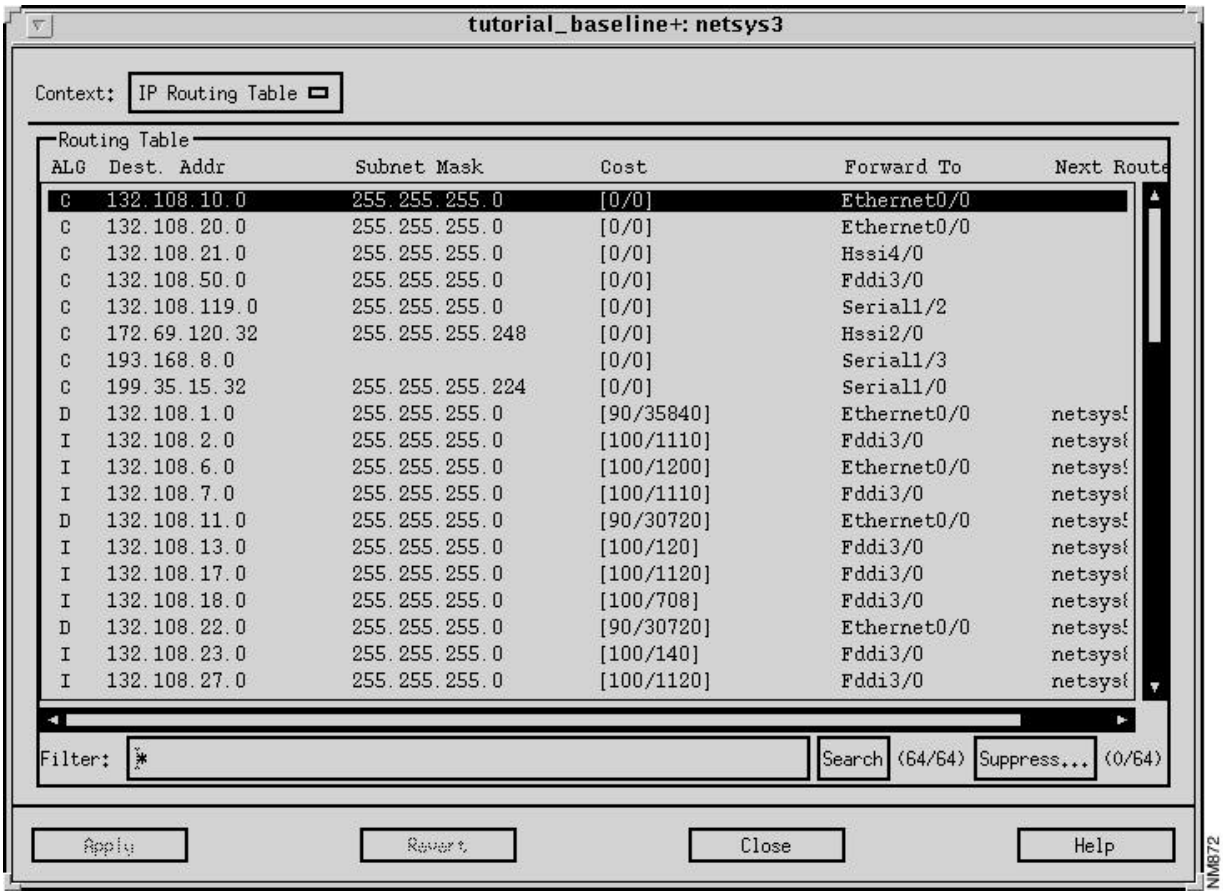

Figure 9-8 IP Routing Table Window

IP Routing Table Window Components

This window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Apply**, **Revert**, **Close**, and **Help** buttons.

Routing Table

The IP Routing Table pane displays a particular router's routing table entries. An IP routing table entry contains the routing algorithm, IP destination network address, IP destination address mask, administrative distance/cost factor, interface used to send packets to the next router along the path to the destination end system, and the next router in the path to the destination end system values.

Clicking on an IP Routing Table pane column header automatically sorts the information displayed in that column within the IP Routing Table pane accordingly. For example, when you click on the **Forward to** column header, the information displayed in the IP Routing Table pane is alphabetically sorted by the router's interface names.

Note The EIGRP summary routes, produced from EIGRP **summary-address** commands and auto-summarization, are explicitly treated. For example, if the `netsys1` router is running EIGRP and summarizes route `16.17.17.0 255.255.255.0` to form `16.17.0.0 255.255.0.0`, the following entry appears in `netsys1`'s Routing Table:

```
D 16.17.0.0   255.255.0.0 [0/0] Null0
```

This corresponds to the following route that appears in `netsys1`'s Routing Table after entering a **show ip route** command:

```
D 16.17.0.0 is a summary, 17:07:51, Null0
```

Routing Table - ALG

The protocol algorithm from which the IP Routing Table entry is derived from is displayed in this column. The possible values are provided in Table 9-1:

Table 9-1 IP Protocol Algorithm Values

Symbol	IP Protocol Algorithm Derived From
C	directly connected
D	EIGRP
EX	external EIGRP
I	IGRP
O	OSPF route which is neither inter-area or external
OE1	external OSPF route having metric type 1
OE2	external OSPF route having metric type 2
OIA	OSPF route that crossed areas (inter-area OSPF route)
R	RIP
S	static
*	candidate default route
?	unknown derivation

Routing Table - Dest Addr

The IP address of the destination subnet or destination network is displayed in this column. Routing Table entries with a blank destination address have the same destination address as the entry preceding it in the Routing Table.

Routing Table - Subnet Mask

The IP subnet mask corresponding to the destination address is displayed in this column.

Routing Table - Cost

The first number displayed within the bracket is the administrative distance (trustworthiness) of the routing information source. Administrative distance values range from 0 to 255, inclusive. The general rule is the higher the value, the lower the trust rating. An administrative distance value of 255 signifies that the routing information source should not be trusted.

The second number is the metric for the route. For RIP, the metric is equal to hop count. For IGRP and EIGRP, the metric is a combination of segment delays and the lowest bandwidth for the route. In a network of mixed media, the route with the lowest metric generally equates to the most desirable path to the destination.

Note All EIGRP summary routes appear with [0/0] in this column. This does not reflect the administrative distance or cost of the lowest cost route associated with the EIGRP summary route.

Routing Table - Forward to

The router's interface to be used to send packets to the next router along the path to the destination end system, is displayed in this column. EIGRP routes that have been summarized are shown by `null` being displayed in this field.

Routing Table - Next Router

The next router in the path to the destination end system is displayed in this column. Double-clicking on a Routing Table entry highlights the next hop router in the Topology window.

Routing Table - Filter

You are able to use the **Filter** field to specify a specific algorithm, destination address, subnet mask, cost, or device to search for within each IP Routing Table entry. Pressing **Return** or clicking on the **Search** button initiates the search using the filter you have specified. The IP Routing Table entries containing text matching the search pattern are then displayed in the Routing Table pane. For example, if you wish to find all routes with a cost factor of `0/0`, you would specify **`*\[0\/0\]*`** in the **Filter** field and then press **Return** or click on the **Search** button. Only the IP Routing Table entries containing routes with a cost factor of `0/0` are then displayed in the Routing Table pane.

Special search characters are available for your use. The backslash character is used as a means to escape special characters. A wild card character (asterisk) is used to match any character. When the **Filter** field contains only an asterisk (the default search mode) all IP Routing Table entries are displayed in the Routing Table pane.

The question mark is used to denote any one character. For example, if you specify **`*netsys?*`** in the **Filter** field, all IP Routing Table entries containing the string `netsys` and ending with any character are displayed in the Routing Table pane.

The negation operator (tilde) is used to denote the characters *not* to match on within the IP Routing Table. It is only allowed as the first character in the **Filter** field. For example, if you specify **`~*132.*`** in the **Filter** field and then press **Return** or click on the **Search** button, all entries *not* containing the string `132.` are displayed in the Routing Table pane.

Compound searches are also permitted. For example, if you wanted to display all IP Routing Table entries with destination addresses starting with `132.108` and whose next hop router is `netsys8`, you would enter **`*132.108*netsys8*`** in the **Filter** field and then press **Return** or click on the **Search** button.

Routing Table - **Search** Button

Click on this button to initiate the search of the IP Routing Table using the filter you have specified in the **Filter** field. The number of IP Routing Table entries matching the specified filter and a total of all Routing Table entries are displayed within parentheses next to the **Search** button.

Routing Table - **Suppress** Button

Click on this button to remove specified types of entries from the IP Routing Table. See "IP Suppress Entries Window Components" for detailed information about the Suppress Entries window components. The number of Routing Table entries being suppressed and a total of all Routing Table entries are displayed within parentheses next to the **Suppress** button.

IP Suppress Entries Window Components

The IP Suppress Entries window, shown in Figure 9-9, is displayed when you click on the **Suppress** button in the IP Routing Table window. This window allows you to specify the information you wish to keep from being included in the IP Routing Table being displayed. For example, you can specify to have all IGRP (I) related entries suppressed from the IP Routing Table by selecting the Add Suppression **ALG** button, specifying **I** in the **ALG** field, deselecting all other **Add Suppression** buttons, and then clicking on the **Add** button.

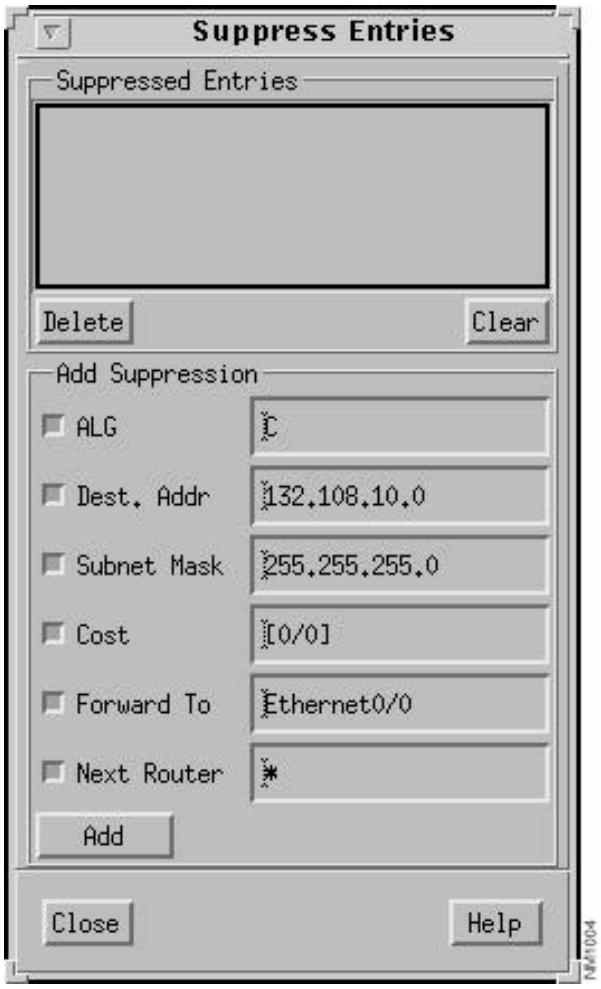

Figure 9-9 Suppress Entries Window (IP)

This window's components are described in the following sections. See "General Window Components" for a description of the **Close** and **Help** buttons. When you click on the **Close** button, the suppression parameters currently in effect are saved. When you subsequently invoke the Suppress Entries window, the suppression parameters that were in effect when the window was last closed remain in effect.

Suppressed Entries

A list of the suppressed entries currently in effect are displayed in this pane. When an entry is added to this list, the IP Routing Table entries that match the suppression parameters are no longer displayed in the IP Routing Table. Initially suppression is not in effect, therefore the Suppressed Entries list is empty.

Suppressed Entries - Delete Button

Select an entry from the Suppressed Entries list then click on this button to remove that entry from the list. The IP Routing Table entries that were suppressed due to this entry being in effect are redisplayed and the entry's suppression parameters are removed from existence.

Suppressed Entries - Clear Button

Click on this button to remove all of the entries used to suppress IP Routing Table entries from the Suppressed Entries list. The IP Routing Table entries that were suppressed due to these entries being in effect are redisplayed and *all* suppression parameters are removed from existence.

Add Suppression

The Add Suppression pane **contains** buttons related to the columns in the IP Routing Table window's Routing Table pane. Deselecting **a** button removes that category from suppression consideration. Select **a** button and then specify a value that when found within that column in an IP Routing Table entry, will cause that entry to be suppressed from the table. For example, if you want to suppress IP Routing Table entries that use the `Ethernet0/0` interface to forward packets on to the next router, select the **Forward To** button, specify **`Ethernet0/0`** in the button's text field, deselect the other **Add Suppression** buttons, then click on the **Add** button. All entries that contained `Ethernet0/0` in the **Forward To** column are no longer shown in the IP Routing Table. The suppression number within the parentheses next to the **Suppress** button is updated to reflect the number of IP Routing Table entries currently being suppressed.

When you initially click on the **Suppress** button or create a suppression entry and add it to the Suppressed Entries list, all of the **Add Suppression** buttons in the Suppress Entries window are selected and their corresponding text fields contain the values associated with the selected entry in the IP Routing Table window. Clicking on the **Add** button at this point removes that entry from the IP Routing Table.

You can use the wild card character (an asterisk) to match any or all characters. When a field contains only an asterisk it is equivalent to specifying all items within that category. For example, specifying an asterisk in the **ALG** field, deselecting all other **Add Suppression** buttons, and then clicking on the **Add** button results in an empty IP Routing Table as the suppression mode was set to suppress entries for *all* protocol algorithms.

Add Suppression - ALG

Select the **ALG** button and then specify the protocol algorithms whose entries you do not want included in the IP Routing Table, in the **ALG** field.

Add Suppression - Dest. Addr

Select the **Dest. Addr** button and then specify the destination addresses whose entries you do not want included in the IP Routing Table, in the **Dest. Addr** field.

Add Suppression - Subnet Mask

Select the **Subnet Mask** button and then specify the subnet mask whose entries you do not want included in the IP Routing Table, in the **Subnet Mask** field.

Add Suppression - Cost

Select the **Cost** button and then specify the cost values whose entries you do not want included in the IP Routing Table, in the **Cost** field.

Add Suppression - Forward To

Select the **Forward To** button and then specify the symbolic router interfaces whose entries you do not want included in the IP Routing Table, in the **Forward To** field.

Add Suppression - Next Router

Select the **Next Router** button and then specify the name of the next router along the path to the destination whose entries you do not want included in the IP Routing Table, in the **Next Router** field.

Add Suppression - Add Button

Once you have selected the IP Routing Table **category** button(s) and specified the associated text in the button's text field(s), clicking on the **Add** button adds the suppression parameters to the Suppressed Entries list and initiates the suppression of the corresponding entries from the IP Routing Table. The number of entries currently being suppressed (displayed within parentheses next to the **Suppression** button in the IP Routing Table window) is updated accordingly.

When you click on the **Close** button, the suppression parameters currently in effect are saved. When you subsequently invoke the Suppress Entries window, the suppression parameters that were in effect when the window was last closed remain in effect.

IP Static Routes Window

The IP Static Routes window, shown in Figure 9-10, is displayed when you click on the **IP Static Routes** button in the Router Configuration window. This window allows you to view, modify, and delete IP Static Route entries defined for the router. The initial list of entries is specified by the **ip route** global configuration command in the router configuration file. Static routes are generally appropriate when a router cannot dynamically build a route to a destination.

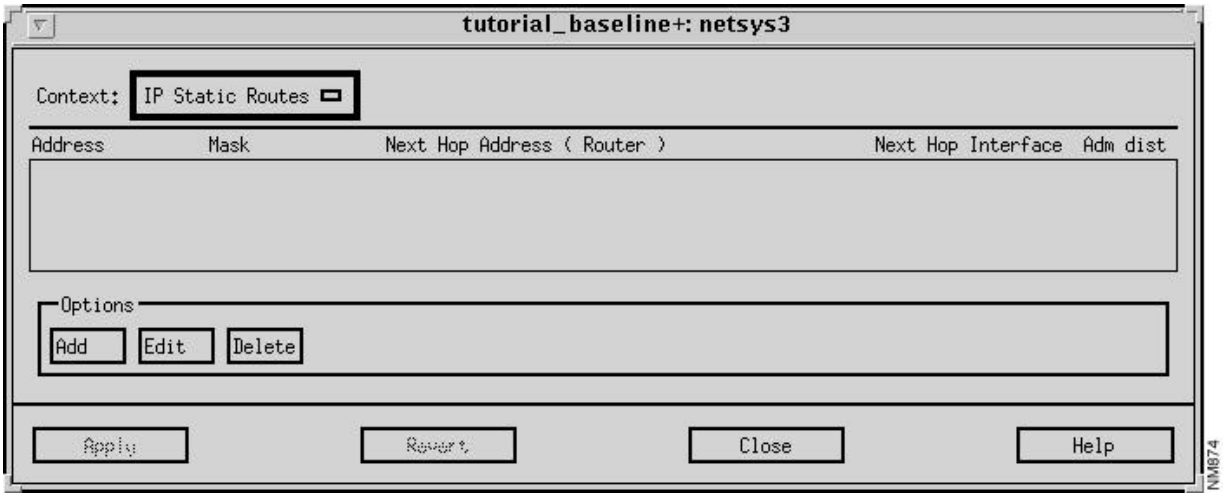

Figure 9-10 IP Static Routes Window

IP Static Routes Window Components

This window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Add**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add** and **Edit** buttons displays the Edit IP Static Routes List window. See "Edit IP Static Routes List Window Components" for a detailed description of the window's components.

Address

The IP address, in dotted-decimal format, of the target network or subnet is displayed in this column.

Mask

The IP network mask, in dotted-decimal format, for masking network and subnetwork bits is displayed in this column.

Next Hop Address (Router)

The IP address of a router that can reach the network that is one hop away from the current router is displayed in this column. The router name, if known, is displayed within parentheses and corresponds to the next hop along the path to the target network.

Next Hop Interface

The symbolic name of the router interface on the next router along the path to the target network is displayed in this column.

Adm Dist

The administrative distance or trust rating of a routing information source is displayed in this column. Valid distance numbers range from 0 through 255. The values 0-9 are reserved for internal use. The default administrative distance for an IP Static Route is 1. The general rule is the higher the value, the lower the trust rating. An administrative distance value of 255 signifies that the routing information source should not be trusted.

Edit IP Static Routes List Window Components

The Edit IP Static Routes List window, shown in Figure 9-11, is displayed when you click on the **Add** or **Edit** buttons in the IP Static Routes window. You can select a specific entry in the list of IP Static Routes prior to clicking on the **Add** or **Edit** buttons. You can add or modify an existing IP static route entry in a router configuration file using this window.

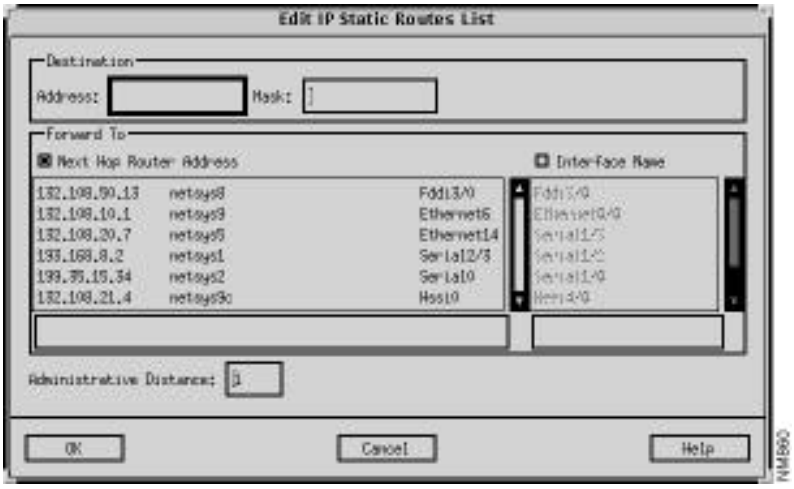

Figure 9-11 Edit IP Static Routes List Window

Destination - Address

Specify the IP address, in dotted-decimal format, of the destination network in this field.

Destination - Mask

Specify the network mask, in dotted-decimal format, for the destination network in this field.

Forward To - Next Hop Router Address Button

Click on this button to select the IP address of a router that is the next hop along the path to the target network. This button and the **Interface Name** button are mutually exclusive. Clicking on this button activates the Next Hop Router Address List. Select the desired next hop router entry from the list then click on the **OK** button.

Forward To - Interface **Name** Button

Click on this button to select this router's interface to use to get to the next component along the path to the destination network. This button and the **Next Hop Router Address** button are mutually exclusive. Clicking on this button activates the Interface Name List. Select the desired interface entry from the list then click on the **OK** button. The `null 0` entry is a special interface name providing an alternative method of filtering traffic. The overhead involved with using access lists can be avoided by directing undesired network traffic to the `null` interface.

Administrative Distance

Specify the administrative distance or trust rating for the selected IP static route entry in this field. This is a numeric value in the range of 0 through 255 (0 through 9 are reserved for internal use). Generally, the higher the value, the lower the trust rating. An administrative distance value of 255 signifies that the routing information source should not be trusted.

IP Routing Algorithms Window

The IP Routing Algorithms window, shown in Figure 9-12, is displayed when you click on the IP **Algorithms** button in the Router Configuration window. This window allows you to view and modify the IP routing algorithms configured for the router. The IP routing algorithms supported are Routing Information Protocol (RIP), Interior Gateway Routing Protocol (IGRP), Extended Interior Gateway Routing Protocol (EIGRP), and Open Shortest Path First (OSPF).

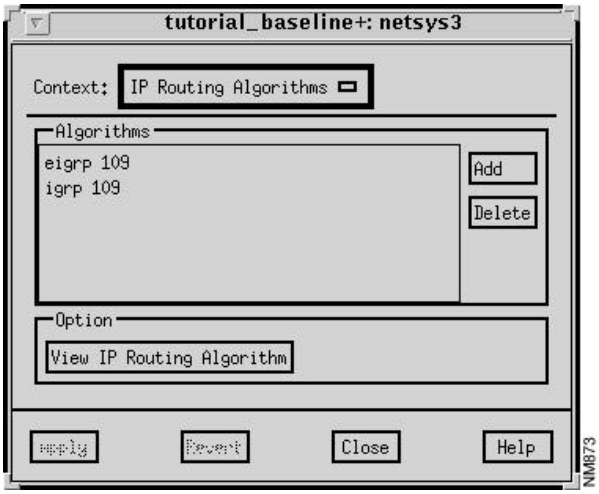

Figure 9-12 IP Routing Algorithms Window

IP Routing Algorithms Window Components

This window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Add**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add** button displays the Edit IP Routing Algorithms List window. See "Edit IP Routing Algorithms List Window Components" for a detailed description of the window's components.

Algorithms

This pane displays a list of the IP Routing Algorithms (RIP, IGRP, EIGRP, and OSPF) available in the current router configuration, as specified by the **router** global configuration command in the router configuration file. To add an IP routing algorithm to the current list, click on the **Add** button. The Edit IP Routing Algorithms List window is displayed. See "Edit IP Routing Algorithms List Window Components" for detailed information about adding an IP routing algorithm to the Algorithms list. To delete an IP routing algorithm from the list of algorithms available in the current router configuration, select the appropriate routing algorithm from the Algorithms list, click on the **Delete** button, then click on the **Apply** button.

To view a particular routing algorithm's attributes, select the appropriate entry from the Algorithms list then click on the **View Routing Algorithm** button.

Option - View IP Routing Algorithm Button

Select one of the listed IP routing algorithms supported from the Algorithms list, then click on this button to switch the context from the IP Routing Algorithms window to the selected RIP, IGRP, EIGRP, or OSPF Algorithm window. Depending on the routing protocol you selected from the Algorithms list, a RIP, IGRP, EIGRP, or OSPF Algorithm window, described in detail in subsequent sections, is displayed. As the RIP Algorithm window is a subset of the IGRP Algorithm window and the IGRP Algorithm window is a subset of the EIGRP Algorithm window, the RIP Algorithm window is discussed first, followed by the additional fields in the IGRP Algorithm window, followed by the additional fields in the EIGRP Algorithm window.

Information about the corresponding routing protocol attributes is shown in the displayed Algorithms window. You can add and modify new attributes or you can delete existing routing protocol attributes.

Edit IP Routing Algorithms List Window Components

The Edit IP Routing Algorithms List window, shown in Figure 9-13, is displayed when you click on the **Add** button in the IP Routing Algorithms window. This window allows you to add an IP routing algorithm to the list of routing algorithms supported in the current router configuration. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

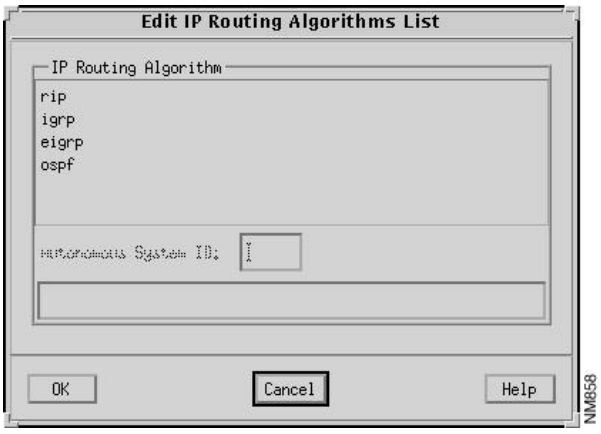

Figure 9-13 Edit IP Routing Algorithms List Window

IP Routing Algorithm

This pane lists the IP routing protocol algorithms (RIP, IGRP, EIGRP, OSPF) that can be added to the current router configuration. Select an entry from the list and where necessary (IGRP, EIGRP, and OSPF) specify an autonomous system ID, then click on the **OK** button. The routing protocol is now displayed in the Algorithms list in the IP Routing Algorithms window. To add additional routing protocols to the Algorithms list, click on the **Add** button again. Once all of the routing protocols you desire are added to or deleted from the Algorithms list, click on the **Apply** button in the IP Routing Algorithms window.

Autonomous System ID

Specify the Autonomous System ID in this field. An autonomous system is a collection of interconnected routers under common management control, or similar routing policies and requirements. Typically, an autonomous system consists of routers connecting multiple IP network numbers. Autonomous System IDs *must* be assigned to the IGRP, EIGRP, and OSPF routing protocols. Routers originating from one autonomous system that need to be advertised into other autonomous systems must be redistributed.

RIP/OSPF/IGRP/EIGRP Algorithm Windows

The appropriate RIP/OSPF/IGRP/EIGRP Algorithms windows are displayed when you select a routing protocol from the Algorithms list in the IP Routing Algorithms window, and then click on the **View Routing Algorithm** button. These windows allow you to view and modify the routing protocol algorithm attributes being used by the router.

The RIP and OSPF Algorithm windows and attributes are the same except where noted. Therefore, only a snapshot of the RIP Algorithm window is shown in this section. As the RIP Algorithm window is a subset of the IGRP Algorithm window and the IGRP Algorithm window is a subset of the EIGRP Algorithm window, the RIP algorithm window is used as the basis for the IGRP and EIGRP algorithm window discussions. Therefore, the RIP Algorithm window, shown in Figure 9-14, is discussed in this section. All of the attributes described in the RIP Algorithm window apply to the IGRP and EIGRP windows as well. The additional fields in the IGRP Algorithm window are described in “IGRP/EIGRP Algorithm Window.” The additional fields in the EIGRP Algorithm window are described in “EIGRP Algorithm Window.”

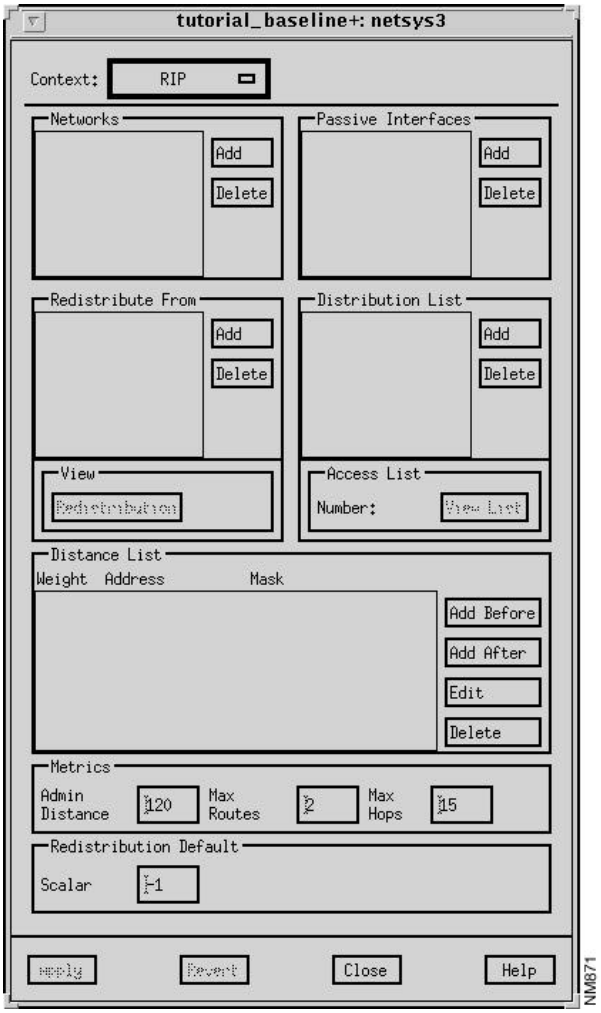

Figure 9-14 RIP Algorithm Window

RIP/OSPF/IGRP/EIGRP Algorithm Windows Components

The window's components that are applicable to all four IP routing protocols are described in the following sections. See "General Window Components" for a description of the **Context**, **Add Before**, **Add After**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add Before**, **Add After**, and **Edit** buttons in the Distance List pane displays the Edit Distance List window. You can select an entry in the Distance List pane prior to clicking on the **Add Before**, **Add After**, and **Edit** buttons. See "Edit Distance List Window Components" for a detailed description of the window's components. To delete an entry from one of the lists displayed in the windows, select the entry, click on the associated **Delete** button, then click on the **Apply** button.

The basic algorithm window is comprised of the following panes which are described in subsequent sections:

- Networks
- Redistribute From

- Passive Interfaces
- Distribution List
- Distance List
- Metrics
- Redistribution Default

Networks

This pane lists the IP network addresses of the networks directly connected to this router, as specified by the **network** router subcommand(s) in the router configuration file. RIP/IGRP/EIGRP routing updates will be sent and received only through interfaces on these networks. If an interface's network is not specified, it will not be advertized in any RIP/IGRP/EIGRP routing updates.

Note This pane is deactivated in the OSPF Algorithm window.

- **Add** Button

  Click on this button to add an IP network address representing a network directly connected to this router, to the Networks list. The Edit Network List window is displayed. See "Edit Network List Window Components" for a detailed description of the window's components. The Edit Network List window adds the selected network address to the Networks list. Click on the **Apply** button to add this directly connected network to the current router configuration.

- Redistribute From

  The router can redistribute information from one routing protocol to another, as specified by the **redistribute** router subcommand in the router configuration file. Adding routing algorithms to the Redistribute From list allows routing information from the protocols in the Redistribute From list to be redistributed to the routing protocol in context. For example, if `IGRP 109` is added to the Redistribute From list in the RIP Algorithm window, `IGRP 109` routing updates with the specified metrics, if any, are redistributed to the RIP routing process.

- **Add** Button

  Click on this button to add a redistribution-from routing algorithm entry to the Redistribution list. The Edit Redistribution List window is displayed. Select the routing algorithm to be added to Redistribution list, then click on the **OK** button. The selected entry is now displayed in the Redistribute From list in the appropriate RIP/OSPF/IGRP/EIGRP Algorithm window. Click on the **Apply** button in the RIP/OSPF/IGRP/EIGRP Algorithm window to add the new redistribute-from routing algorithm entry to the current router's configuration.

- **Redistribution** Button

  Click on this button to switch the context to the selected redistribution-from routing algorithm entry in the Redistribute From list. The Redistribution window is displayed.

  See "Redistribution (Static/IGRP/EIGRP/OSPF to RIP) Window Components" for detailed information about the Redistribution window components when redistributing from IGRP/EIGRP/OSPF to RIP.

  See "Redistribution (Static/RIP/OSPF/IGRP/EIGRP to IGRP/EIGRP) Window Components" for detailed information about the Redistribution window components when redistributing from RIP/OSPF/IGRP/EIGRP to IGRP/EIGRP.

See “Redistribution (Static/OSPF/RIP/IGRP/EIGRP to OSPF) Window Components” for detailed information about the Redistribution window components when redistributing from RIP/OSPF/IGRP/EIGRP to OSPF.

- Passive Interfaces

  This pane lists this routing protocol’s existing passive interfaces. Entries can be added to or deleted from the list. Passive interfaces are disabled from sending routing updates. They are however, able to receive routing updates.

- **Add** Button

  Click on this button to add an interface to the Passive Interfaces list. The Edit Passive Interface List window is displayed. See “Edit Passive Interface List Window Components” for a detailed description of the Edit Passive Interface List window components. After adding an interface to the Passive Interfaces list, click on the **Apply** button. The passive interface is now in effect for this routing protocol in the current router configuration.

Distribution List

This pane lists this router’s interfaces and filter directions, as specified by the **distribute-list** router subcommand that are applied to this routing protocol. Interfaces and access lists can be added to or deleted from this list. The filters update what the router learns or advertises. If the filter direction is set to input, the access list is used to filter networks received in routing updates. If the filter direction is set to output, the access list is used to suppress networks from being advertised in routing updates.

- **Add** Button

  Click on this button to add an IP access list and interface to the Distribution List. The Edit Distribution List window is displayed. See “Edit Distribution List Window Components” for a detailed description of the Edit Distribution List window components. Upon selecting an entry in the Edit Distribution List window, click on the **OK** button to add that entry to the Distribution list. Click on the **Apply** button in the RIP/OSPF/IGRP/EIGRP Algorithm window for the change to take effect in the router configuration.

- Access List Number

  When an entry in the Distribution list is selected, the standard access list number associated with the selected entry is displayed in this field. Valid standard IP access list numbers range from 1 through 99.

- View **List** Button

  Click on this button to switch context to the Distribution Filter List window. A standard access list number must be displayed, via the selection of a Distribution list entry, for the context switch to occur. See “Distribution Filter List Window Components” for a detailed description of the Distribution Filter List window components.

Distance List

This pane allows the Distance list entries, as specified by the **distance** router subcommand in the router configuration file, to be viewed and modified.

- Weight

  The administrative distance or trust rating of a routing information source is displayed in this column. Valid distance numbers range from 0-255, inclusive. The values 0-9 are reserved for internal use. The default administrative distance for an IP Static Route is 1. The general rule is, the higher the value, the lower the trust rating.

- Address

  The IP address of a router or group of routers to which the weight value applies, in dotted-decimal format, is displayed in this column.

- Mask

  The IP mask, in dotted-decimal format, of the target network, is displayed in this column.

Metrics

This pane allows the RIP/OSPF/IGRP/EIGRP algorithm's administrative distance, maximum routes, and maximum hop metric values to be viewed and modified.

- Admin Distance

  Specify the administrative distance or trust rating of a routing information source value in this field. Valid distance numbers range from 0 through 255. The values 0-9 are reserved for internal use. The general rule is, the higher the value, the lower the trust rating.

Table 9-2 Default Administrative Distances

Routing Source	Default Value
Connected Interface	0
Static Route	1
EIGRP	90
IGRP	100
OSPF	110
RIP	120

- Max Routes

  Specify the maximum number of routes available to the router in this field. The default for RIP, OSPF, IGRP, and EIGRP is 2.

- Max Hops

  Specify the maximum number of hops in this field. The default and maximum hop count value for RIP is 15 hops. The default and maximum hop count value for OSPF, IGRP, and EIGRP is 100 hops.

Redistribution Default - Scalar

The global default scalar value for the redistributed route, as specified by the **default-metric** router command, can be specified in this field. This results in the RIP/OSPF routing protocol using the same scalar metric value for all learned routes redistributed from the IGRP or EIGRP routing protocols. Since RIP/OSPF and IGRP/EIGRP have incompatible metrics, using the default scalar metric provides a reasonable substitute and enables redistribution to proceed. The default for RIP and OSPF is -1 which equates to no global default scalar being set.

Setting the metrics in this field automatically propagates these values to the metrics in the Redistribute From window. If you then set the metrics in the Redistribution window, the metric values in the Redistribution window take precedence over the Redistribution Default metrics. Otherwise, the values from Redistribution Default metrics are used.

Edit Network List Window Components

The Edit Network List window is displayed when you click on the **Add** button in the Network pane of the RIP/IGRP/EIGRP Algorithm window. This window allows you to add the IP network number of a network directly connected to this router to the Networks list in the RIP/IGRP/EIGRP Algorithm window. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

Network Addresses

The network addresses of the networks directly connected to this router are displayed in this pane. To add an entry to the Networks list in the Algorithm window, select an entry in this list then click on the **OK** button. The directly connected network's network address is displayed in the Networks list in the Algorithm window.

Edit Redistribution List Window Components

The Edit Redistribution List window, shown in Figure 9-15, is displayed when you click on the **Add** button in the Redistribute From pane of the RIP/OSPF/IGRP/EIGRP Algorithm window. This window allows you to add a routing algorithm to the Redistribute From list. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

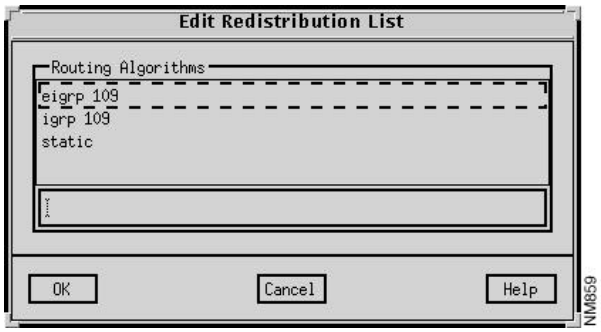

Figure 9-15 Edit Redistribution List Window

Routing Algorithms

The routing algorithms redistribution is allowed from are displayed in this pane. Select an entry then click on the **OK** button. The selected routing algorithm is then displayed in the Redistribute From list in the Algorithm window. Click on the **Apply** button for the change to be applied to the router's configuration.

Redistribution (Static/IGRP/EIGRP/OSPF to RIP) Window Components

The Redistribution window, shown in Figure 9-16, is displayed when you select a routing algorithm entry from the Redistribute From list in the RIP Algorithms window, and then click on the **Redistribution** button. This window allows you to view and modify the parameters associated with the redistribution of routing information. A router can redistribute information from one routing protocol to another, as specified by the **redistribute** router subcommand in the router configuration file. Adding routing algorithms to the Redistribute From list allows routing information from the protocols in the Redistribute From list to be redistributed to the routing protocol in context. For

example, if `IGRP 109` is added to the Redistribute From list in the RIP Algorithm window, `IGRP 109` routing updates are redistributed to the RIP routing process. See "General Window Components" for a description of the **Apply**, **Revert**, **Close**, and **Help** buttons.

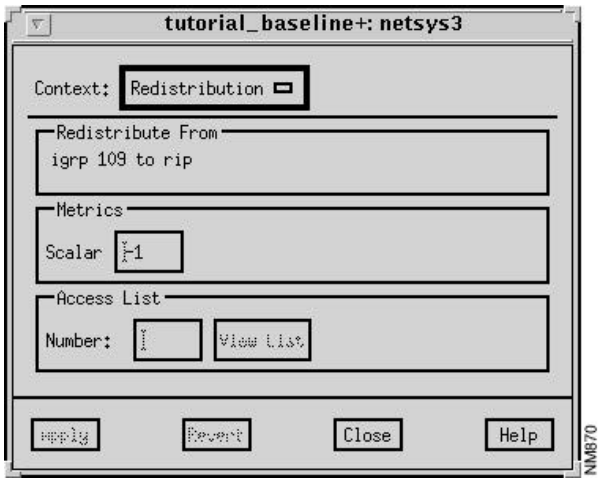

Figure 9-16 Redistribution Window: Static/IGRP/EIGRP/OSPF to RIP

Redistribute From

This pane displays the pair of routing algorithms the redistribution applies to.

Metrics

The scalar value for the redistributed route, as specified by the *redistribute* `protocol` *metric* `scalar_value` router command, can be specified in this field. This results in the RIP and OSPF routing protocols using the same scalar metric value for all learned routes redistributed from the IGRP or EIGRP routing protocols. Since RIP/OSPF and IGRP/EIGRP have incompatible metrics, using the default scalar metric provides a reasonable substitute and enables redistribution to proceed. Specifying a value in this field overrides the global redistribution scalar value set in the RIP Algorithm window's **Redistribution Defaults Scalar** field. The default is -1 which equates to no default scalar metric being set.

Setting the metrics in this field automatically propagates these values to the metrics in the Redistribute From window. If you then set the metrics in the Redistribution window, the metric values in the Redistribution window take precedence over the Redistribution Default metrics. Otherwise, the values from Redistribution Default metrics are used.

Access List Number

Specify a standard IP access list number to filter redistributed routes in this field, press **Return**, then click on the **Apply** button. Valid standard IP access list numbers range from 1 through 99. This corresponds to the standard access list number as specified by the *distribute-list* `access-list-number` *out* `protocol` command.

View List Button

Click on this button to switch the context from the Redistribution window to the Redistribution Filter List window. An access list number *must* be entered in the **Access List Number** text field for the context switch to occur. See "Redistribution Filter List Window Components" for a detailed description of the Redistribution Filter List window components.

Redistribution (Static/RIP/OSPF/IGRP/EIGRP to IGRP/EIGRP) Window Components

The Redistribution window, shown in Figure 9-17, is displayed when you select the RIP routing algorithm entry from the Redistribute From list in the Algorithms window, and then click on the **Redistribution** button. In this case, this window allows you to view and modify parameters associated with the redistribution of routing information from the RIP routing algorithm.

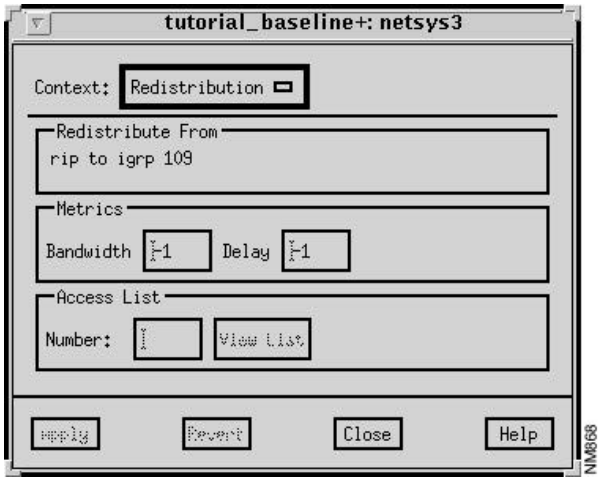

Figure 9-17 Redistribution Window: Static/RIP/OSPF/IGRP/EIGRP to IGRP/EIGRP

Redistribute From

This pane displays the pair of routing algorithms the redistribution applies to.

Metrics - Bandwidth

The minimum bandwidth of the redistributed route, as specified with the *redistribute* `protocol` *metric* `bandwidth` router command, can be specified in this field. The units are in kilobits per second (kbps). Specifying a value in this field overrides the global redistribution bandwidth value set in the IGRP and EIGRP Algorithm window's **Redistribution Defaults Bandwidth** field. The metric bandwidth and delay values must both be set to -1 (not set) or must both not be set to -1 (set). The default is -1 which equates to a default redistribution bandwidth *not* being set.

Metrics - Delay

The delay of the redistributed route, as specified by the *redistribute* `protocol` *metric* `delay` router command, can be specified in this field. This results in the IGRP and EIGRP routing protocols using the same metric value for all learned routes redistributed from the RIP routing protocol. As RIP/OSPF and IGRP/EIGRP have incompatible metrics, using the default metrics provides a

reasonable substitute and enables redistribution to proceed. The units are in microseconds times ten. Specifying a value in this field overrides the global redistribution delay value set in the IGRP and EIGRP Algorithm window's **Redistribution Defaults Delay** field. The metric delay and bandwidth values must both be set to -1 (not set) or must both not be set to -1 (set). The default is -1 which equates to a default redistribution delay *not* being set.

Access List - Number

Specify a standard IP access list number to filter redistributed routes in this field, press **Return**, then click on the **Apply** button. Valid standard IP access list numbers range from 1 through 99. This corresponds to the standard access list number as specified by the *distribute-list* `access-list-number` *out* `protocol` command.

Access List - View List Button

Click on this button to switch the context from the Redistribution window to the Redistribution Filter List window. An access list number *must* be entered in the **Access List Number** text field for the context switch to occur. See "Redistribution Filter List Window Components" for a detailed description of the Redistribution Filter List window components.

Redistribution (Static/OSPF/RIP/IGRP/EIGRP to OSPF) Window Components

The Redistribution window, shown in Figure 9-18, is displayed when you select a routing algorithm entry from the Redistribute From list in the OSPF Algorithms window, and then click on the **Redistribution** button. This window allows you to view and modify the parameters associated with the redistribution of routing information. A router can redistribute information from one routing protocol to another, as specified by the **redistribute** router subcommand in the router configuration file. Adding routing algorithms to the Redistribute From list allows routing information from the protocols in the Redistribute From list to be redistributed to the routing protocol in context. For example, if `rip` is added to the Redistribute From list in the OSPF Algorithm window, RIP routing updates are redistributed to the OSPF routing process. See "General Window Components" for a description of the **Apply**, **Revert**, **Close**, and **Help** buttons.

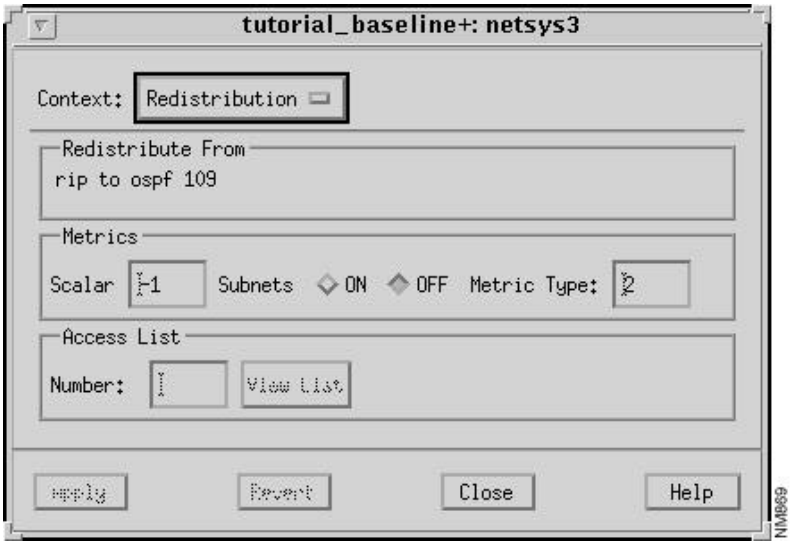

Figure 9-18 Redistribution Window: Static/OSPF/RIP/IGRP/EIGRP to OSPF

Redistribute From

This pane displays the pair of routing algorithms the redistribution applies to.

Metrics

- Scalar

  The scalar value for the redistributed route, as specified by the *redistribute* `protocol` *metric* `scalar_value` router command, can be specified in this field. This results in the OSPF routing protocol using the same scalar metric value for all learned routes redistributed from the IGRP or EIGRP routing protocols. Since OSPF and IGRP/EIGRP have incompatible metrics, using the default scalar metric provides a reasonable substitute and enables redistribution to proceed. Specifying a value in this field overrides the global redistribution scalar value set in the RIP Algorithm window's **Redistribution Defaults Scalar** field. The default is -1 which equates to no default scalar metric being set.

- Subnets

  Click on the **ON** or **OFF** button to allow/disallow redistribution from RIP/IGRP/EIGRP to OSPF subnets. The default is to *not* allow redistribution to OSPF subnets.

- Metric Type

  Specify the number corresponding to the external link type associated with the default route advertised into the OSPF routing domain in this field. Specify a one to use a Type 1 external route. Specify a two to use a Type 2 external route. The default metric type value is 2.

Access List Number

Specify a standard IP access list number to filter redistributed routes in this field, press **Return**, then click on the **Apply** button. Valid standard IP access list numbers range from 1 through 99. This corresponds to the standard access list number as specified by the *distribute-list* `access-list-number` *out* `protocol` command.

View List Button

Click on this button to switch the context from the Redistribution window to the Redistribution Filter List window. An access list number *must* be entered in the **Access List Number** text field for the context switch to occur. See "Redistribution Filter List Window Components" for a detailed description of the Redistribution Filter List window components.

Redistribution Filter List Window Components

The Redistribution Filter List window, shown in Figure 9-19, is displayed when you select an access list number and then click on the **View List** button in the Redistribution window. This window allows you to view, add, edit, and delete entries associated with the selected access list number from the Redistribution Filter list. See "General Window Components" for a description of the **Context**, **Add Before**, **Add After**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add Before**, **Add After**, and **Edit** buttons displays the Edit Redistribution Filter List window. You

can select an entry in the Redistribution Filter list prior to clicking on the **Add Before**, **Add After**, and **Edit** buttons. See "Edit Redistribution Filter List Window Components" for a detailed description of the window's components.

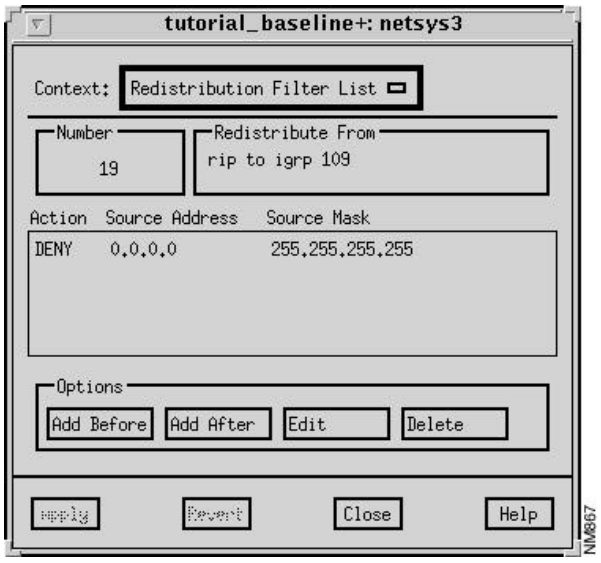

Figure 9-19 Redistribution Filter List Window

Number

This field displays the selected standard IP access list number. Valid standard IP access list numbers range from 1 through 99.

Redistribute From

This pane displays the pair of distinct routing algorithms the redistribution is to occur between.

Action

The Action column specifies either `PERMIT` or `DENY`. `PERMIT` allows redistribution of the specified address. `DENY` denies redistribution of the specified address.

Source Address

The source IP address is displayed in this column.

Source Mask

The source IP address mask is displayed in this column.

Edit Redistribution Filter List Window Components

The Edit Redistribution Filter List window, shown in Figure 9-20, is displayed when you click on the **Add Before**, **Add After**, and **Edit** buttons in the Redistribution Filter List window. This window allows you to add or modify a Redistribution Filter list entry. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

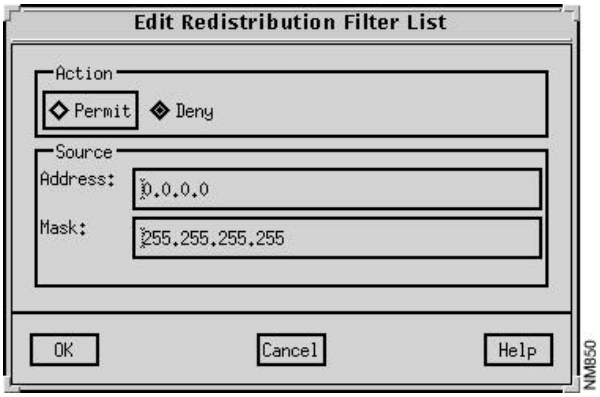

Figure 9-20 Edit Redistribution Filter List Window

Action - Permit/Deny Buttons

Click on either the **Permit** or **Deny** toggle button to control whether networks matching the address/mask are redistributed. Those denied are not passed to the routing protocol in context.

Source - Address

Specify a valid IP address, in dotted-decimal format, in this field.

Source - Mask

Specify an IP address mask, in dotted-decimal format, signifying the bits in the Source Address to be ignored, in this field.

Edit Passive Interface List Window Components

The Edit Passive Interface List window is displayed when you click on the **Add** button in the Passive Interfaces pane of the RIP/OSPF/IGRP/EIGRP Algorithm window. This window allows you to select and add a passive interface to the routing protocol configuration. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

Interfaces

A list of the router interfaces is displayed. Select an entry from the list, then click on the **OK** button to add that interface to the Passive Interface list. Passive router interfaces are disabled from sending routing updates. They are able to receive routing updates.

Edit Distribution List Window Components

The Edit Distribution List window, shown in Figure 9-21, is displayed when you click on the **Add** button in the Distribution List pane of the RIP/OSPF/IGRP/EIGRP Algorithm window. This window allows you to select and add an interface and filter direction (input or output) to the router's Distribution list. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

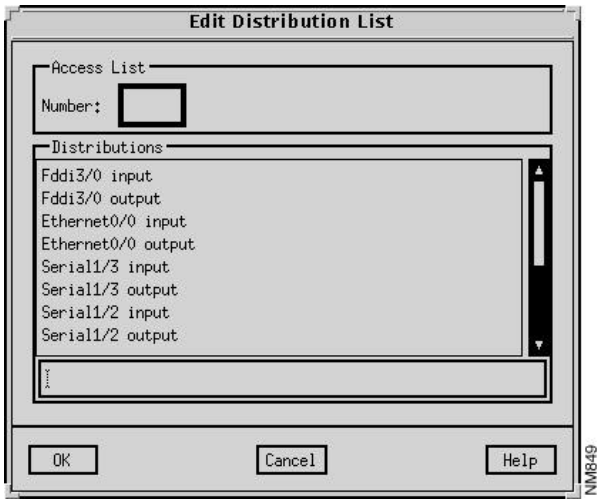

Figure 9-21 Edit Distribution List Window

Access List - Number

Specify a standard IP access list number to be assigned to the selected IP routing protocol in this field. Valid standard IP access list numbers range from 1 through 99.

Distributions

This pane lists the available interfaces and filtering direction (`input` or `output`) that can be added to the router's Distribution List. Select an entry from the list, then click on the **OK** button. Special values are `all input` and `all output` which apply to all input and output interfaces, respectively.

Distribution Filter List Window Components

The Distribution Filter List window, shown in Figure 9-22, is displayed when you select a Distribution List entry in the RIP/OSPF/IGRP/EIGRP Algorithm window and then click on the **View List** button. This window allows you to view, add, edit, and delete the entries associated with the selected access list number. See "General Window Components" for a description of the **Context**, **Add Before**, **Add After**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add Before**, **Add After**, and **Edit** buttons displays the Edit Distribution Filter List window. You can select an entry in the Distribution Filter list prior to clicking on the **Add Before**, **Add After**, and **Edit** buttons. See "Edit Distribution Filter List Window Components" for a detailed description of the window's components.

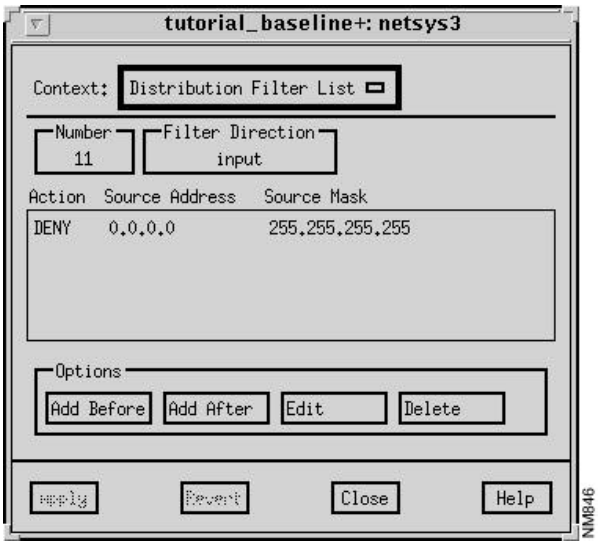

Figure 9-22 Distribution Filter List Window

Number

The selected standard IP access list number applied to the routing updates sent or received through the interface is displayed in this field. Valid standard IP access list numbers range from 1 through 99.

Filter Direction

The filter direction for the selected distribution interface (input or output) is displayed in this field.

Action

The Action column is set to either `PERMIT` or `DENY`. `PERMIT` allows distribution of the specified address. `DENY` denies distribution of the specified address.

Source Address

The IP network address is displayed in this field in dotted-decimal format.

Source Mask

The IP source mask, in dotted-decimal format, signifying the bits in the source address to be ignored, is displayed in this field.

Edit Distribution Filter List Window Components

The Edit Distribution Filter List window, shown in Figure 9-23, is displayed when you click on the **Add Before**, **Add After**, and **Edit** buttons in the Distribution Filter List window. This window allows you to create or modify a Distribution Filter list entry.

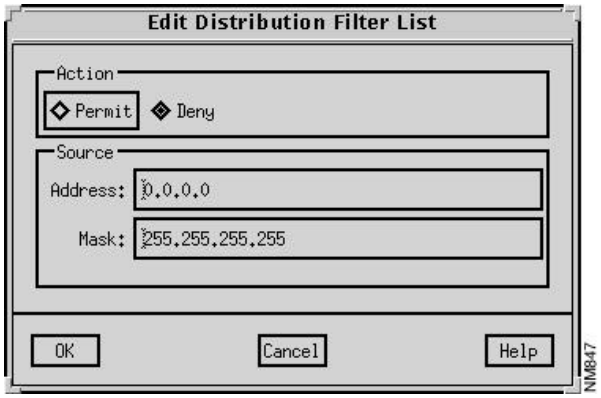

Figure 9-23 Edit Distribution Filter List Window

Action - Permit/Deny Buttons

Click on either the **Permit** or **Deny** toggle button to set the action mode, accordingly. You select the **Permit** button to allow distribution of the specified address. Select the **Deny** button to deny distribution of the specified address.

Source - Address

Specify a valid IP address, in dotted-decimal format, as the Source Address in this field.

Source - Mask

Specify an IP address mask, in dotted-decimal format, signifying the bits in the Source Address to be ignored, in this field.

Edit Distance List Window Components

The Edit Distance List window, shown in Figure 9-24, is displayed when you click on the **Add Before**, **Add After**, and **Edit** buttons in the Distance List pane in the RIP/OSPF/IGRP/EIGRP Algorithm window. This window allows entries in the RIP/OSPF/IGRP/EIGRP Algorithms window's Distance List to be modified.

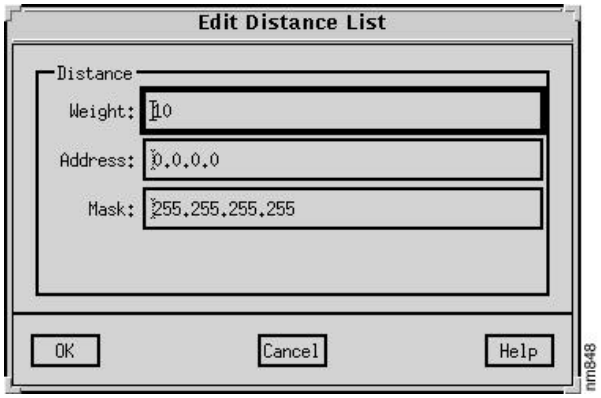

Figure 9-24 Edit Distance List Window

Distance - Weight

Specify the administrative distance or trust rating of a routing information source in this column. Valid distance numbers range from 0 through 255. The values 0-9 are reserved for internal use. The default administrative distance for an IP Static Route is 1. The general rule is, the higher the value, the lower the trust rating.

Distance - Address

Specify the IP address, in dotted-decimal format, of a router or group of routers to which the weight value applies in this field.

Distance - Mask

Specify the IP address mask, in dotted-decimal format, of the target network in this field.

IGRP/EIGRP Algorithm Window

The IGRP/EIGRP Algorithm window allows you to view and modify all of the router's routing protocol attributes described in "RIP/OSPF/IGRP/EIGRP Algorithm Windows," as well as IGRP/EIGRP specific attributes. This window is displayed when you select an EIGRP or IGRP entry in the Algorithms list in the IP Routing Algorithms window and then click on the **View IP Routing**

Algorithm button. The IGRP/EIGRP Algorithm window is the same as the RIP Algorithm window with a few additional fields. The additional fields are shown in Figure 9-25.

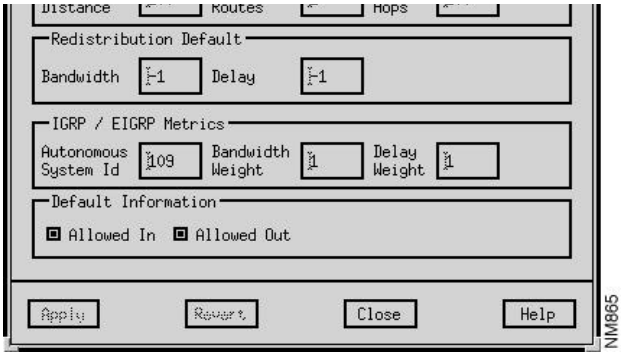

Figure 9-25 IGRP/EIGRP Algorithm Window (partial view)

IGRP/EIGRP Algorithm Window Components

Redistribution Default

Global bandwidth and delay redistribution metric values can be specified in the corresponding fields in this window pane. Setting the metrics in this field automatically propagates these values to the metrics in the Redistribute From window. If you then set the metrics in the Redistribution window, the metric values in the Redistribution window take precedence over the Redistribution Default metrics. Otherwise, the values from Redistribution Default metrics are used.

- Bandwidth

  Specify the minimum bandwidth of the redistributed route in this field. The units are in kilobits per second (kbps). The bandwidth and delay values must both be set to -1 (not set) or must both *not* be set to -1 (set). The default global bandwidth value for IGRP and EIGRP is -1 which equates to a default bandwidth metric not being set.

- Delay

  Specify the delay of the redistributed route in this field. This results in the IGRP and EIGRP routing protocols using the same metric value for all learned routes redistributed from the RIP routing protocol. As RIP and IGRP/EIGRP have incompatible metrics, using the default metrics provides a reasonable substitute and enables redistribution to proceed. The units are in microseconds times ten. The delay and bandwidth values must both be set to -1 (not set) or must both *not* be set to -1 (set). The default global delay metric value for IGRP and EIGRP is -1 which equates to a default delay metric not being set.

IGRP/EIGRP Metrics

The following IGRP and EIGRP metrics can be specified:

- Autonomous System ID

  Specify the Autonomous System ID in this field. An autonomous system is a collection of interconnected routers under common management control, or similar routing policies and requirements. Typically, an autonomous system consists of routers connecting multiple IP

network numbers. Autonomous System IDs *must* be assigned to the IGRP, EIGRP, and OSPF routing protocols. Routers originating from one autonomous system that need to be advertised into other autonomous systems must be redistributed.

- Bandwidth Weight

  Specify the bandwidth weight for tuning the bandwidth metric as it is passed through the router, in this field. The default value is 1.

- Delay Weight

  Specify the route delay weight for tuning the delay metric as it is passed through the router, in this field. The default value is 1.

Default Information - Allowed In/Allowed Out Buttons

Click on the **Allowed In** or **Allowed Out** button to control exterior information between IGRP/EIGRP processes, as specified by the **default_information allowed** [**in**/**out**] command. Default information allowed in permits IGRP exterior or default routes to be received by an IGRP process. Default information allowed out permits IGRP exterior routes to be advertised in updates. The default for **both** buttons is on.

EIGRP Algorithm Window

The EIGRP Algorithm window allows you to view and modify all of the router's routing protocol attributes described in "RIP/OSPF/IGRP/EIGRP Algorithm Windows" and in "IGRP/EIGRP Algorithm Window," as well as EIGRP specific attributes. This window is displayed when an EIGRP entry in the Algorithms list in the IP Routing Algorithms window is selected and the **View IP Routing Algorithm** button is clicked. The EIGRP Algorithm window is the same as the IGRP/EIGRP Algorithm window with additional external administrative distance metric and auto summary options.

EIGRP Metric - External Admin Dist

Specify the external administrative distance value for EIGRP external routes in this field. External routes are those for which the best path is learned from a neighbor external to the autonomous system. The default external administrative distance metric value is 170.

EIGRP Option - Auto-Summary

Click on this **toggle** button to turn the Auto Summary feature on/off. This is used to perform automatic summarization of subnet routes into network level routes. For example, `133.106.1.0` can be configured to be advertised as `133.106.0.0` over interfaces that have subnets of `192.31.7.0` configured. Automatic summarization is performed when there are two or more network router configuration commands configured for the IP EIGRP process. By default, this feature is not enabled.

This command works in conjunction with EIGRP summary addresses in which additional summarization can be performed. If auto-summary is in effect, there is no need to configure network level summaries. The EIGRP summary addresses are ignored. See "IP EIGRP Summary Address Window Components" for information about EIGRP summary addresses.

IP Default Networks Window

The IP Default Networks window, shown in Figure 9-26, is displayed when you click on the **IP Default Networks** button in the Router Configuration window. This corresponds to the *ip default-network network* command which is used to specify a network as a candidate route for computing the gateway of last resort. This window allows you to view, add, edit, and delete entries associated with the Default Networks List.

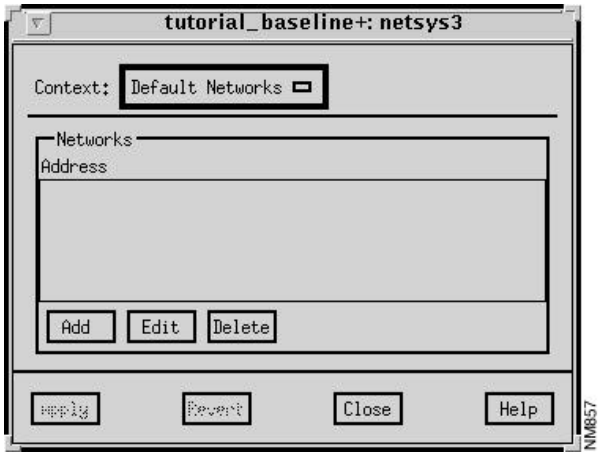

Figure 9-26 IP Default Networks Window

IP Default Networks Window Components

This window's components are described in the following sections. See "General Window Components" for a description of the **Context**, **Add**, **Edit**, **Delete**, **Apply**, **Revert**, **Close**, and **Help** buttons. Clicking on the **Add** and **Edit** buttons displays the Edit Default Networks List window. See "Edit Default Networks List Window Components" for a detailed description of the window's components.

Networks - Address

The addresses of the default networks for this router configuration are displayed in this pane.

Edit Default Networks List Window Components

The Edit Default Networks List window is displayed when you click on the **Add** or **Edit** buttons in the Default Networks window. You can select a specific entry in the Default Networks window prior to clicking on the **Add** or **Edit** buttons. The Edit Default Networks List window allows you to add an entry to the router's Default Networks List. See "General Window Components" for a description of the **OK**, **Cancel**, and **Help** buttons.

Default Networks

A list of the default networks are displayed in this pane. To add a new default network to the list, specify its name in the text field below this pane then click on the **OK** button.

IP Access List Summary Window

The IP Access List Summary window, shown in Figure 9-27, is displayed when you click on the IP **Access List** button in the Router Configuration window. This window allows you to view the existing IP access list numbers applied to the interfaces and/or routing algorithms.

If values appear in the **Access List**, **Interface**, and **Direction** columns and the **Algorithm** column is blank, the access list is applied to an interface.

If values appear in the **Access List**, **Interface**, and **Direction** columns, and one algorithm is listed in the **Algorithm** column, the access list is applied to an distribution.

If values appear in the **Access List**, **Interface**, and **Direction** columns, and two algorithms are listed in the **Algorithm** column (e.g. `igrp 109 -> rip`), the access list is applied to a redistribution.

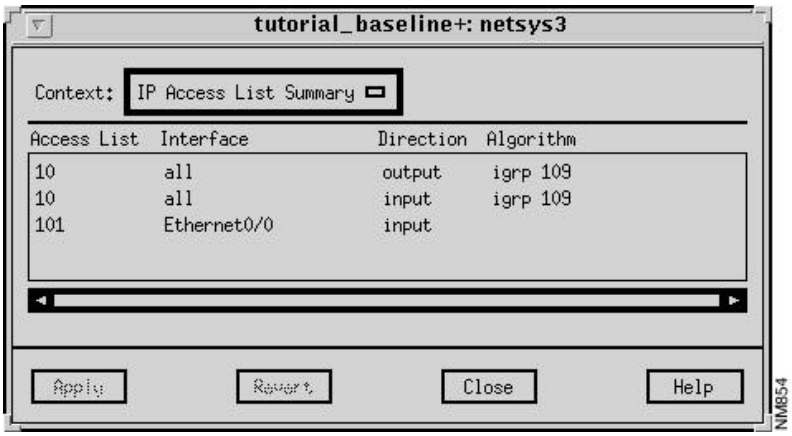

Figure 9-27 IP Access List Summary Window

IP Access List Summary Window Components

This window's components are described in the following sections. See "General Window Components" for a description of the **Close** and **Help** buttons.

Access List

Existing IP access list numbers are displayed in this column.

Interface

The router interfaces the IP access list numbers are applied to are displayed in this column.

Direction

The filter direction (`Input, Output, Both`) the IP access list number is applied to is displayed in this column.

Algorithm

The IP routing algorithms (where appropriate) the access list number is applied to are displayed in this column.