CHAPTER 7

Connection Management

Overview

Use the SV+ Connection Manager to create and maintain end-to-end Frame Relay and ATM connections. Frame relay connections include dial-up and dial backup connections when the network is enhanced with the Intelligent Network Server (INS) Dial-Up Frame Relay application. Parameters that you define at the Connection Manager Window are validated and sent to either the INS server or Connection Manager server.

Note: INS Dial-Up and Dial-Backup connections are not physically added to a frame relay network until an INS user dials into the network. Even though they are configured by the StrataView Plus Connection Manager, these connections are considered dormant until they are needed. The *INS DAS Server Shelf Installation Manual* and the *INS Dial-Up Frame Relay Operations Guide* provide detailed information about instating and configuring the INS Dial-Up Frame Relay application, and includes instructions for using the Connection Manager.

You can open up to four Connection Manager windows at a SV+ desktop.

Configuration Management

The Connection Manager Window presents updated status information as dependent on the Connection Mode selected at the Main Window. Connection Modes are either Normal Mode or Dial-Up Mode. Normal Mode presents standard Frame Relay and ATM Connections (PVCs), and Dial-up Mode presents INS Dial-up and Dial-Backup connections (PVCs).

The Connection Manager Windows

Connection Manager (Main Window) Window

Use this window to configure end-to-end frame relay and ATM connections.

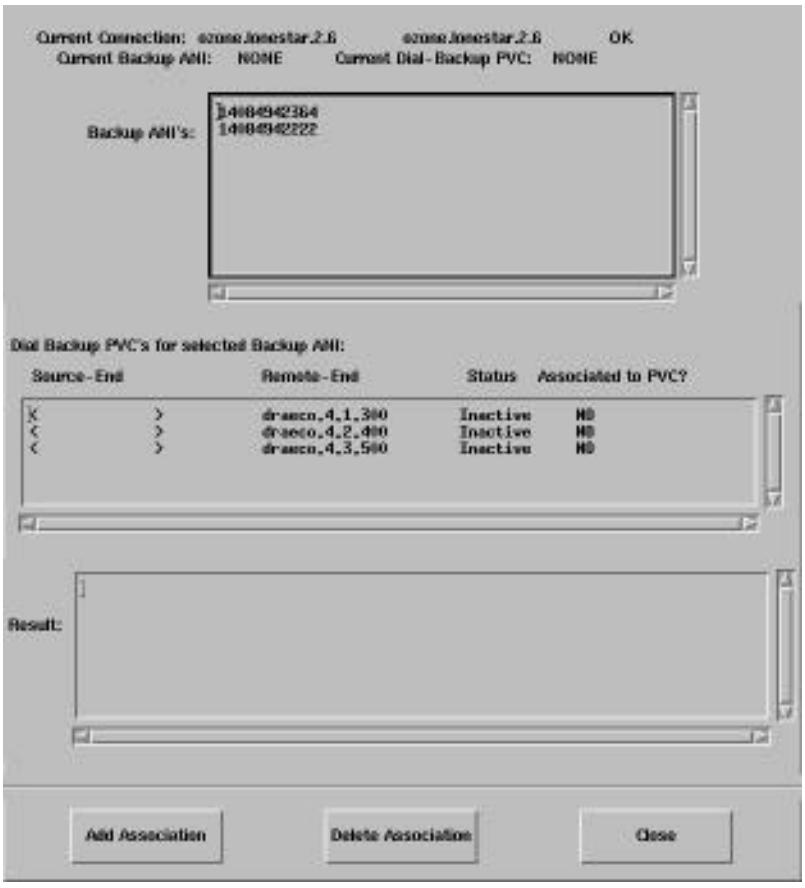
Figure 7-1 Connection Manager: Main Window

Connection List Filters — This portion of the window is used to specify the filters that should be used when building the Connection list. Once all the desired fields have been filled, press the 'Apply' button to update the connection list.

Connection Mode	This button toggles to either Network mode or INS ANI mode. Normal mode displays standard Frame Relay and ATM Connections (PVCs). INS ANI mode displays the INS Dial-Up and Dial-Backup Identifications (ANIs).
Connection Type	A radio box allowing the user to specify the type of connection to be configured. Connection Type may be FR - FR, ATM - ATM, ATM - FR, or CE - CE.
Connection Status	A radio box allowing the user to specify 1 or more types of connection status that should be used to filter the list of connections. Connection Status may be OK, Failed, Incomplete, and Down.
Local Information	Node name and port number of the local end-point. Any or all these fields may be specified. The button with the "..." label next to the shelf text entry field opens a scroll list of node names and a corresponding shelf name if the node name entered corresponds to a BPX.
Remote Node Name	A text edit window for the user to specify that only connections to this remote node from the local node will be displayed. If no remote node is designated, connections from the local node to all other nodes are to be displayed.
Connection List	A scrolling text window displaying all the connections which match the filter criteria. The user may select one or more entries from this list for modification or delete. Each entry in the list has the following format:
Local end-point	<nodename>.<interfaceshelfname>.<slot>.<port>.<DLCI> or <nodename>.<interfaceshelfname>.<slot>.<port>.<vpi>.<vci> If the end-point is a frame relay end-point the first format is used, if it is an ATM end-point the second format is used. If shelf is not applicable the shelf field will be omitted. ci> For an ATM end-point the second format is used. If shelf is not applicable the shelf field will be omitted.
Remote end-point	<remotenode>.<interfaceshelfname>.<slot>.<port>.<DLCI> or <remotenode>.<interfaceshelfname>.<slot>.<port>.<vpi>.<vci> If the end-point is a frame relay end-point the first format is used, if it is an ATM end-point the second format is used. If shelf is not applicable the shelf field will be omitted.
Connection type	Connection Type may be FR - FR, ATM - ATM, ATM - FR, or CE - CE.
Connection status	Any incomplete connection segments in feeder shelves and BNI-BNI connection segment in BPXs display the unknown termination points as "Unknown" and an "Incomplete" status. The remote end may report BPX node, slot, port, vpi, and vci.

Apply button	This button updates the entries in connection list according to the criteria set in the filter field.
Refresh button	Indicates that the connection database has changed by changing its background color to red. This button updates the connection list with the new information
Associate Backup button	The Associate Backup dialog box has two basic functions, “Add Association”, and “Delete Association”. The “Associated to PVC?” column indicates whether or not the Dial-Backup PVC is already associated to a Normal PVC If the Selected Normal PVC is already associated with a Dial-Backup PVC, then the Display fields at the top of the window are updated to indicate which ANI and which Dial-Backup PVC is already associated to this Normal PVC. If the Normal PVC is already associated, select “Delete” to remove the association. The user can then select a Dial-Backup PVC and “Add” to add a new association. The Add association is performed by selecting the Add Association... button. The selected Normal PVC is then associated with the selected Dial-Backup PVC. Only Dial-Backup PVC’s that have NO association to a PVC can be selected for association. The Dial Backup ANI will never have more than five Dial-Backup PVC’s.

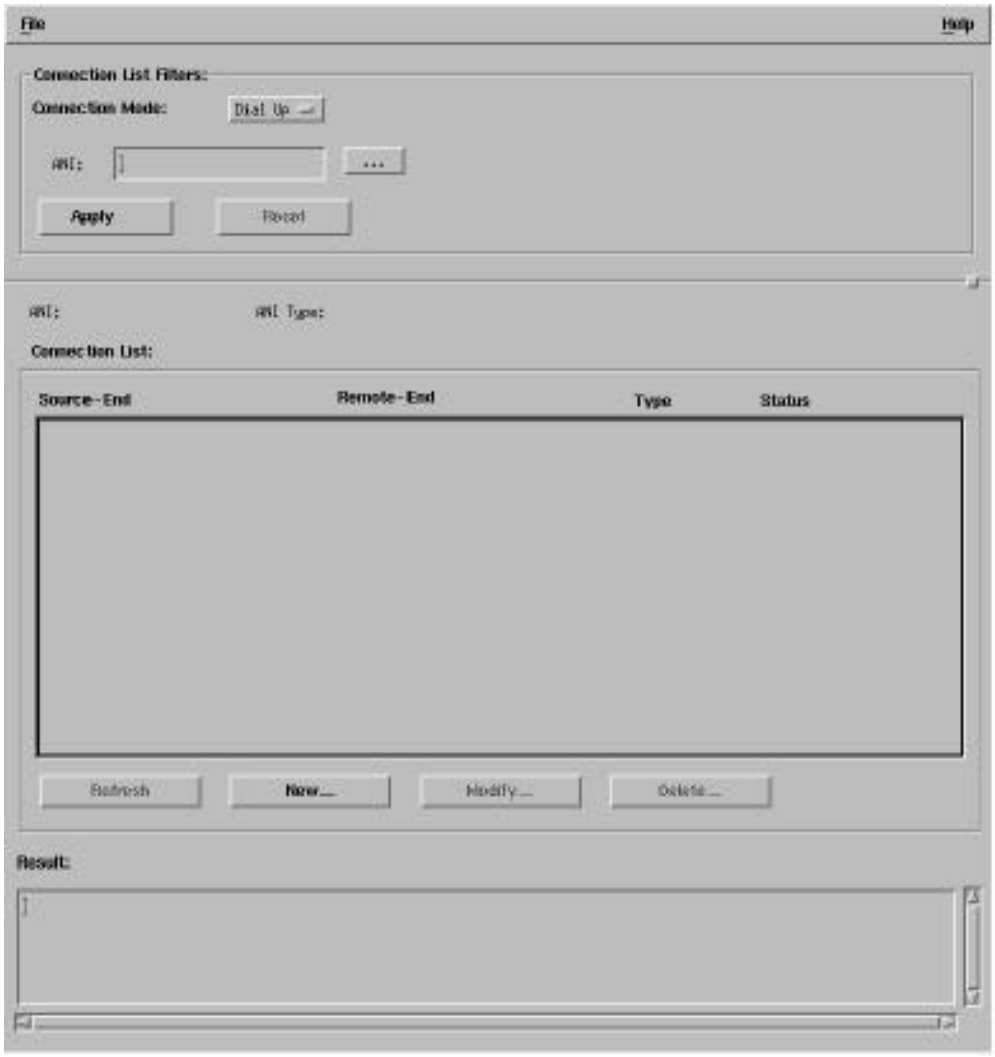
Figure 7-2 Associate Dial Back-up Window



Dial-Up Connection Mode

The ANI field is a 20 character numeric field. It is selected from a listbox that is popped up when the "..." button is depressed. When an ANI is selected, all of the connections defined on the INS server for the selected ANI are displayed.

Figure 7-3 Connection Manager: Dial-Up Mode



The Main Window connection list display is changed in "Dial-Up" mode, with a connection Status of Active or Inactive in the connection(s) listbox field. Active INS connections cannot be modified. Only connections that are Inactive can be further modified via the main window Modify button or deleted with the Delete button.

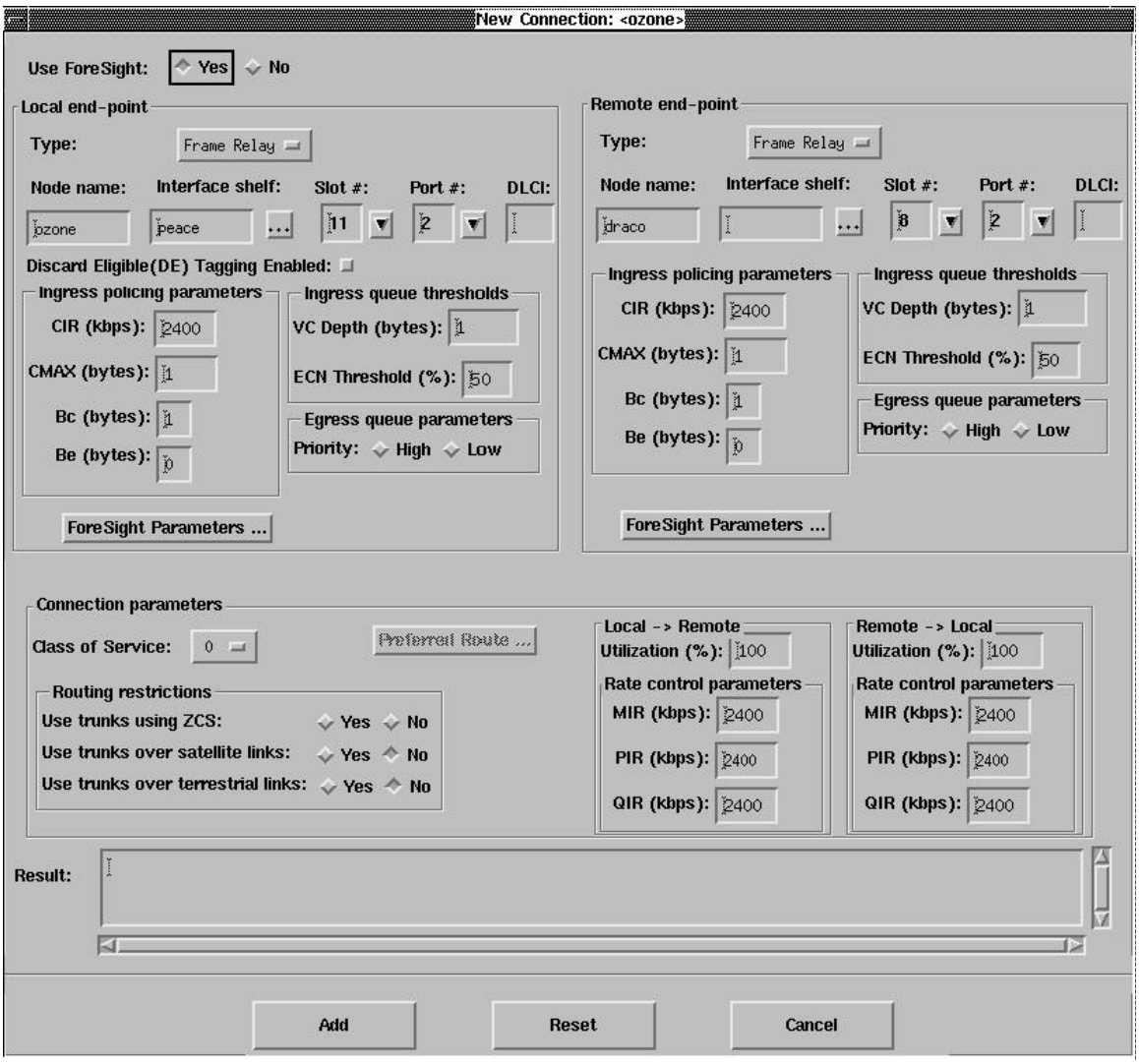
Adding a new Dial-Up Connection

To add a new Dial-Up connection to a n ANI, select the New button to begin addition of a new connection.

Note ANI's are configured through the INS Server GUI which is invoked through the SV+ Admin GUI.

Use this window to set parameters for a new dialup connection.

Figure 7-4 Connection Manager: New Dial-Up Connection Window



Local and Remote End-Point — A region to enter local and remote end-point parameters:

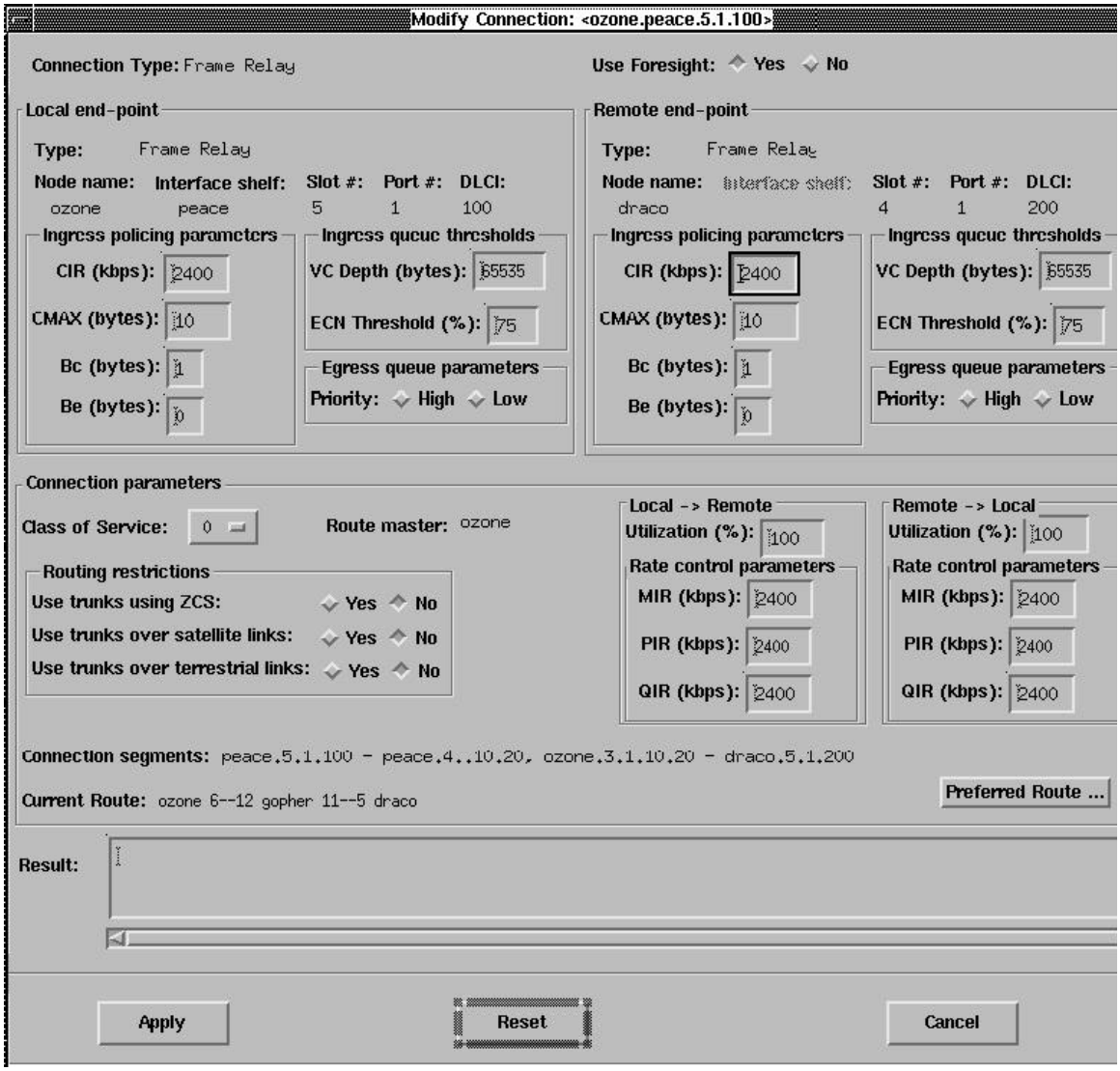
End PointType	Disabled for FR-FR connections.
Port Type	Option Menu for specifying port type of end points to be displayed in port help list connection window.
Node Name	A text field to enter node name. The default node name is the local node name specified in the connection filter in the main connection window
Interface Shelf	A text field to enter the interface shelf name. The shelf field will be disabled if the node name refers to an IPX node.
Help Button	The button with the label "..." next to the shelf text entry field will pop-up a dialog box to help the user select node name and the corresponding interface shelf name.
Port Number	A text field to enter slot number and port number ranges from 1 to the maximum slot number in the shelf. This field does not have any default values. Format: <slot>.<port>
DLCI Number	A text field to enter the DLCI number. Value range is 1-1024. There is no default value for this field.
Parameters	These are all the end-point parameters. The parameters will change based on end-point type. All the parameters will be shown with default values. Typically the user will set both end-point's parameters to the same values.
Ingress Policing Parameters	
CIR	A text field to enter the CIR (in kbps) of the end-point. Value range is 0-2048.
CMAX	A text field to enter the CMAX (in number of bytes) of the end-point. Value range is 1-255.
Bc (Committed Burst Size)	A text field to enter the committed burst size (in bytes) of the end-point. Value range is 1-65535.
Be (Excess Burst Size)	A text edit window to enter the excess burst size (in bytes) of the end-point. Value range is 0-65535.
Ingress Queue Threshold	
Virtual Circuit Queue Depth	A text edit window to enter the VC queue size (in bytes) for the end-point. Value range is 1-65535. Defaults to 65535.
ECN Threshold	A text edit window for ECN threshold (specified as % of Virtual Circuit Queue Depth) for the end-point. Value range is 0-100%.
Egress Queue Parameters	
Priority	A radio box allowing the user to set High or Low as the value. The default is Low.

Connection Parameters	This region is used to enter the connection parameters for both local and destination end-points
Use Foresight	A toggle button to enable or disable ForeSight. The default is Foresight disabled.
Class of Service	A text field for specifying the re-routing priority of the connection, ranges from 0 to 15. This defaults to 0.
Preferred Route	This button that will open the Configure Preferred Route Window, used to specify the preferred route path. Only routes for intra-domain connections may be specified (the network does not support preferred routes of inter-domain connections).
Routing Restrictions	This form is used to specify the types of trunks that should be avoided when the connection is routed.
Use trunks using ZCS	A radio box is used to specify whether ZCS trunks should be used. Defaults to No.
Avoid trunk type	A radio box is used to specify whether satellite links should be used. Defaults to No. A radio box is used to specify whether terrestrial links should be used. Defaults to No.
Originating and Terminating Remote and Remote Terminating and Originating	These 2 forms are used to specify parameters that affect the connection in the direction of the local-end to the remote-end (Local->Remote) and remote-end to local-end (Remote->Local) respectively.
Utilitization	A text field to set the channel utilization (in percentage). Value range is 1–100. Defaults to 100.
Rate control Parameters	
MIR	A text field to enter the CIR (in kbps) of the end-point. Value range is 0–2048. Defaults to 9.6.
PIR	A text field to enter the PIR (in kbps) of the end-point. Value range is 0–2048. Defaults to the port speed of the connection.
QIR	A text edit window to enter the QIR (in kbps) of the end-point. Value range is 0–2048. Defaults to 9.6.
Result field	A scrollable read-only window to display the error message or result of the operation. The detailed content of this field will be determined during design.

Connection Manager - Modify Connection Menu

Use this menu to set new parameters for existing connectivity configurations.

Figure 7-5 Modify Connection Window



Local and Remote End Point	A region to enter local and remote end-point parameters. Endpoint type and Endpoint identification information is not editable. The Type, Node name, Interface Shelf, Slot #, Port #, DLCI fields are not editable.
Parameters	These are all the end-point parameters. These parameters may be modified.
Ingress policing parameters	
CIR	A text field to enter the CIR (in kbps) of the end-point. Value range is 0–2048.

CMAX	A text field to enter the CMAX (in number of bytes) of the end-point. Value range is 1–255.
Bc (Committed Burst Size)	A text field to enter the committed burst size (in bytes) of the end-point. Value range is 1–65535.
Be (Excess Burst Size)	A text edit window to enter the excess burst size (in bytes) of the end-point. Value range is 0–65535.
Be (Excess Burst Size)	A text edit window to enter the excess burst size (in bytes) of the end-point. Value range is 0–65535.
Virtual Circuit Queue Depth	A text edit window to enter the VC queue size (in bytes) for the end-point. Value range is 1–65535.
ECN Threshold	A text edit window for ECN threshold (specified as % of Virtual Circuit Queue Depth) for the end-point. Value range is 0–100%.
Egress Queue Parameters	
Priority	A radio box allowing the user to set High or Low as the value. The default is Low.
Connection Parameters	
Use Foresight	A toggle button to enable or disable ForeSight. There is no default for modifying.
Class of Service	A text field for specifying the re-routing priority of the connection, ranges from 0–15.
Route Master	A node name of the node that is responsible for routing this connection. This field is not editable.
Routing Restrictions	This form is used to specify the types of trunks that should be avoided when the connection is routed.
Use trunks using ZCS	A radio box is used to specify whether ZCS trunks should be used.
Avoid trunk types option menu	A radio box is used to specify whether satellite links should be used.
Avoid trunk types option menu	A radio box is used to specify whether terrestrial links should be used.
Originating -Terminating Terminating - Originating	These 2 forms are used to specify parameters that affect the connection in the direction of the local-end to the remote-end (Local->Remote) and remote-end to local-end (Remote->Local) respectively.
Utilization	A text field to set the channel utilization (in percentage). Value range is 1–100.

Rate Control Parameters	
MIR	A text field to enter the CIR (in kbps) of the end-point. Value range is 0–2048.
PIR	A text field to enter the PIR (in kbps) of the end-point. Value range is 0–2048.
QIR	A text edit window to enter the QIR (in kbps) of the end-point. Value range is 0–2048.
Connection segments	This field displays all the connection segments that make up the entire connection. The format is: <local-endpt><intermediate-endpoint1>, <intermediate-endpoint2> -] remote-endpt
Current Route	This field displays the current route of the connection. The format is: <node name> [<out trunk> -- <in trunk> <node name>] The portion within the square brackets may be repeated up to 9 times. This field is not editable.
Preferred Route	This button opens the Configure Preferred Route Window, used to specify the preferred route path. Only routes for intra-domain connections may be specified (the network does not support preferred routes of inter-domain connections).
Result Field	A scrollable read-only window to display the error message or result of the operation. The detailed content of this field will be determined during design.
Apply Button	This button modifies the end-points and connection parameters, the result of the operation will be displayed in the result window. Once the user requests a modify, all buttons on this window will be disabled and this window will stay open till the action is completed.
Reset Button	The button to clear all the values currently shown on the screen and restore the original values for the connection.
Cancel Button	Use this button to close the window.

Menu: Connection Manager - Configure Menu

In this section, we will focus on how a user adds a connection. Specific screens that follow will show the following types of connections:

- ATM-ATM connections
  - CBR.1 connection
  - VBR.1 connection
  - VBR.2 connection
  - ABR.FS connection
- ATM-FR connection
- CE-CE connection
  CE - CE (AXIS to AXIS)

Connection type—This section allows the user to specify the connection type further. For example for ATM-ATM, and ATM-FR connections the service type specification will be displayed here.

Originating/Terminating end-point definition—This section provides for the specification of the originating/terminating end-point. A user can choose an end-point type of ATM or Frame Relay. Different fields will be displayed for defining the end-point depending on the end-point type and the end-point card type. The end-point card type is automatically determined by the GUI.

An end-point is defined by its end-point type and its node, [shelf], slot, [line], port, and [channel] information. Examples of specific terminating end-point definitions are as follows:

- ASI (ATM)—node, slot.port, vpi.vci.
- AUSM (ATM)—node.shelf, slot.port, vpi.vci.
- CESM (ATM)—node.shelf,slot.port.
- FRP (Frame Relay)—node, slot.port, dlci for routing IPX and node.shelf, slot.port, dlci for feeder IPX
- FRSM (Frame Relay)—node.shelf, slot.port, dlci

The prompt for end-point definition has changed from the prompt used in Release 8.1. Instead of prompting for Node name, Interface Shelf, Slot, Line, and Port, you will be prompted for Node Name where Node Name will be in the form <Node Name.Shelf Name> and Port number will be in the form <slot#.logical port#>. A logical port number is defined to be unique across a given slot.

As an example; in order to represent node bpx01, shelf axis01, slot 5, line 1, physical port 1, logical port 10, dlci 100, for Release 8.1 you would enter:

```
bpx01    axis01    5    1    1    100
```

but in 8.2 you would enter:

```
bpx01.axis01    5.10    100.
```

Note Physical port was used in release 8.1 while logical port is used in release 8.2.

Based on the end-point type appropriate Originating/Terminating end-point parameters are displayed in the region just below this one.

- Originating/Terminating end-point parameters—This section enables a user to specify parameters related to the originating/terminating end-point. The fields which are displayed are determined by the Originating/Terminating end-point definition.
- Connection parameters—This section allows a user to specify connection parameters. The fields displayed in this section are driven by the connection type specified in the connection classification section.

New ATM-ATM Connection

An ATM-ATM connection is one in which both originating and terminating end-point types are ATM.

Five different service types (CBR.1, VBR.1, VBR.2, VBR.3, ABR.FS) are supported for ATM connections. Based on the service type selected, the end-point and connection parameters are changed. Parameters that are common across the different screens are only described on the first screen that they are shown in.

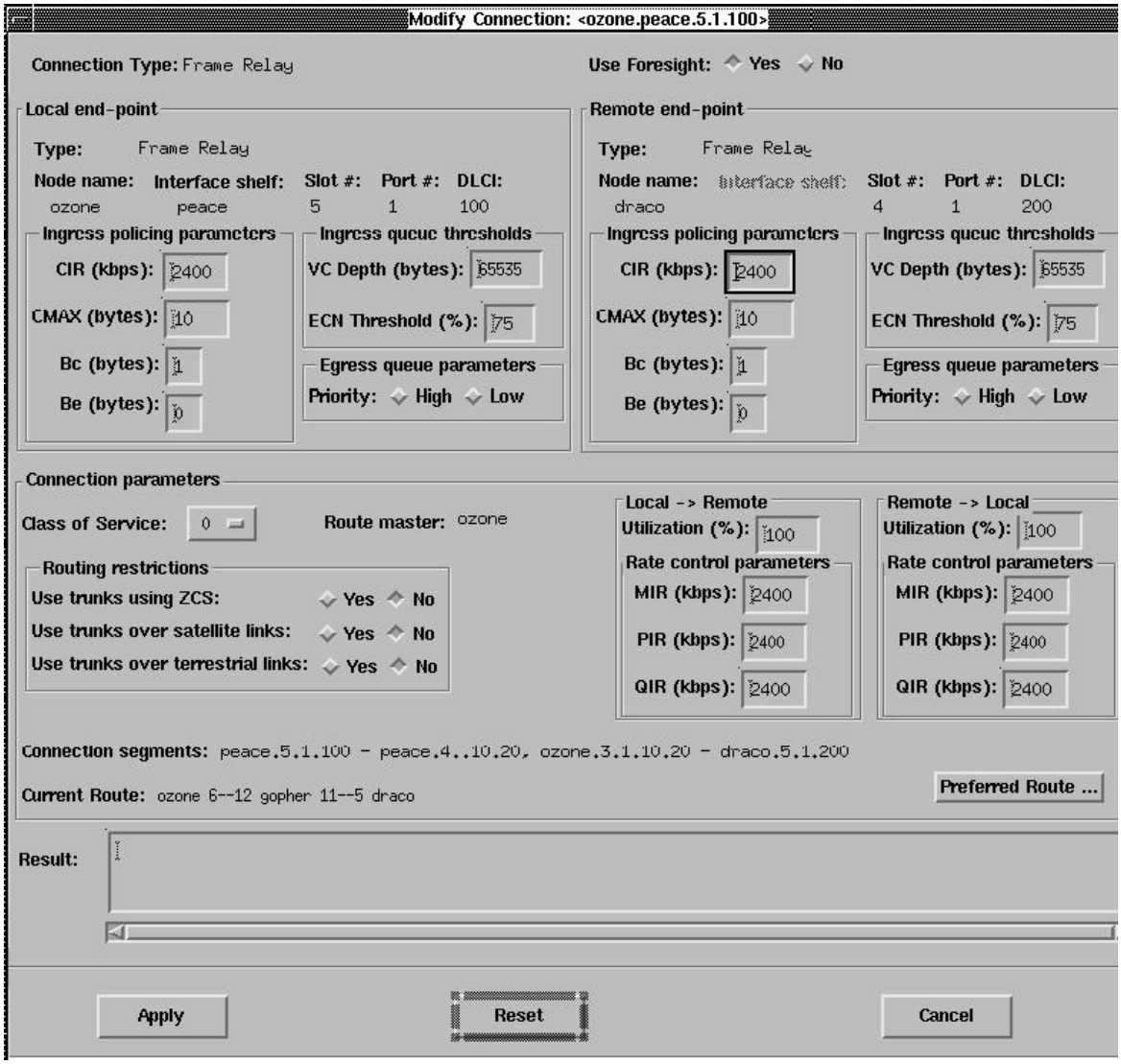
Both ASI and AUSM end-points have the same parameters, the range and default values are different for the 2 end-point types. For each service type the range and default values for all relevant parameters are shown.

The Connection Manager GUI supports both VPC and VCC connections. For VPC connections the VCI value is specified as a '*' e.g. 5.* would be a VPC using VPI of 5.

ATM-ATM CBR.1 Connection

Figure 7-6 shows the parameters required to add a CBR.1 ATM connection. In this case, from the users perspective both ASI and AUSM end-points have the same parameters. The ranges and default values that are valid for the two end-point types are listed in Figure 7-6. Additional end-point and connection parameters required by the network elements (BPX, AXIS) and not shown on the screen will be set automatically by Connection Manager Daemon.

Figure 7-6 New ATM-ATM Connection Window for CBR.1 Connections



ATM-ATM CBR.1 connection configuration parameters are shown below:

Connection Classification

- Connection Type—A read-only field indicating the connection type.

End-point definition (Originating and Terminating)

- Node name, Port #, VPI, VCI—Text fields allowing for the specification of the end-point node name, logical port number, and VPI (Virtual Path Identifier).VCI (Virtual Channel Identifier).
- The end-point card type is automatically determined by the GUI. When the user tabs out of the interface shelf text field, the GUI will determine whether or not an interface shelf has been specified. When the user tabs out of the port # field, the GUI will determine the card type that is, AUSM, ASI, etc. and display the appropriate parameters.
- [▪▪▪]—Push button which displays Node Shelf Help and Port Help Windows when pressed.

End-point parameters (Originating and Terminating)

- Ingress UPC parameters:
  - PCR0+1—A text field to enter the PCR0+1 (Peak Cell Rate) for all cells with CLP set to 0 and 1. Value range is 10 cells per second - port rate. Default is the port rate.
  - CDVT0+1—A text field to enter the CDVT0+1 (Cell Delay Variation Tolerance). The default is 10,000 microseconds.
- Connection Parameters
  - Reroute priority—
  - Preferred Route—Push button which pops up Preferred Route Window.
  - Routing restrictions—
  - Rate parameter—Originating->Terminating and Terminating->Originating parameters

Table 7-1 ASI and AUSM end-point parameter for CBR.1 Connection

	ASI		AUSM	
Parameter (units)	**Range**	**Default**	**Range**	**Default**
PCR0+1 (cells)	10–port rate (96k/80k/353208)	10	10–port rate (3622/4528/4830)	port rate
CDVT0+1	1–250,000	10,000	1–250,000	10,000
Utilization (%)	1–100	100	1–100	100

Table 7-2 Connection parameter for CBR.1 connection

	ASI		AUSM	
Parameter (units)	**Range**	**Default**	**Range**	**Default**
MCR (cells) not editable	10 –port rate	PCR0+1	10–port rate	PCR0+1
%Utilization	1–100	100	1–100	100

ATM-ATM VBR.1 Connection

Figure 7-7 shows the parameters required to add a VBR.1 ATM connection. This section will only discuss the parameters that are different from the ones already discussed for ATM CBR.1 connections. The ranges and default values that are valid for ASI and AUSM end-point types are listed in Table 7-3.

Figure 7-7 New ATM-ATM Connection Window for VBR.1 Connection

End-point parameters (Originating and Terminating) for VBR.1 connection

- Ingress UPC Parameter:
  - **SCR0+1 (cells)—**A text field to enter the SCR (Sustainable Cell Rate). Value range is 10 - port speed in cells per second. The maximum value is the port speed. Default value is 10.
  - **MBS—**A text field to enter the MBS (Maximum Burst Size). MBS corresponds to CBS (Committed Burst Size). Value range is 1 - 24000 cells. Default value is 1000.

Connection Parameters

- Rate parameter—Originating->Terminating and Terminating->Originating parms:
  - **Utilization (%)—**

Figure 7-8 ATM-ATM Connection Window for VBR.2 Connections

Figure 7-9 ATM-ATM Connection Window for VBR.3 Connections

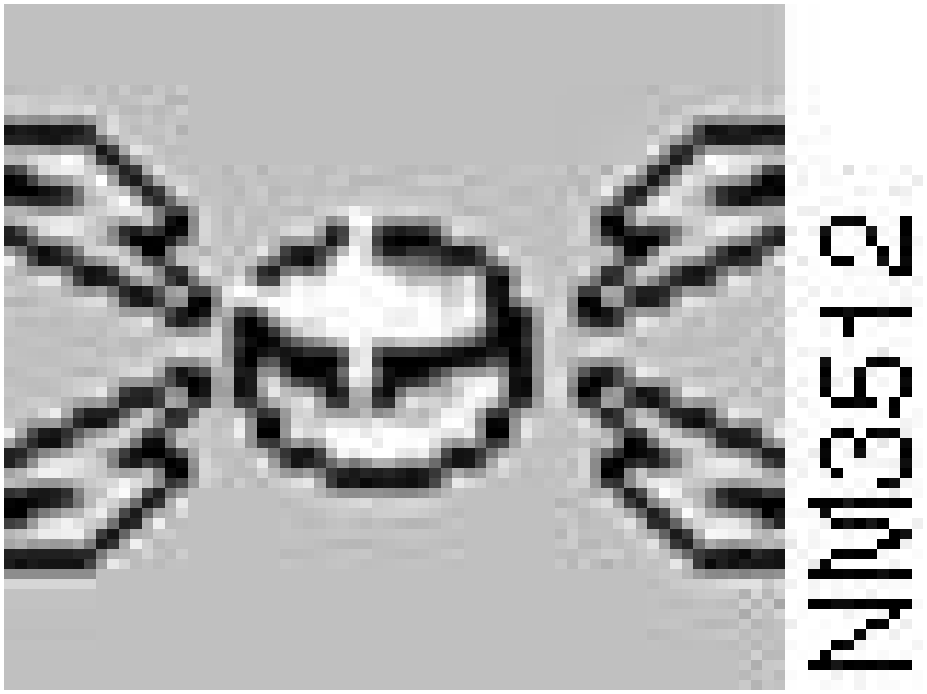


Table 7-3 ASI and AUSM end-point parameter for VBR.1 connection

	ASI		AUSM	
Parameter (units)	**Range**	**Default**	**Range**	**Default**
PCR0+1 (cells)	10–port rate	10	10–port rate	port rate
CDVT0+1	1–250,000	10,000	1–250,000	10,000
SCR0+1 (cells)	10–port rate	10	10–port rate	port rate
MBS (cells)	1–24,000	1000	1–5,000	1,000

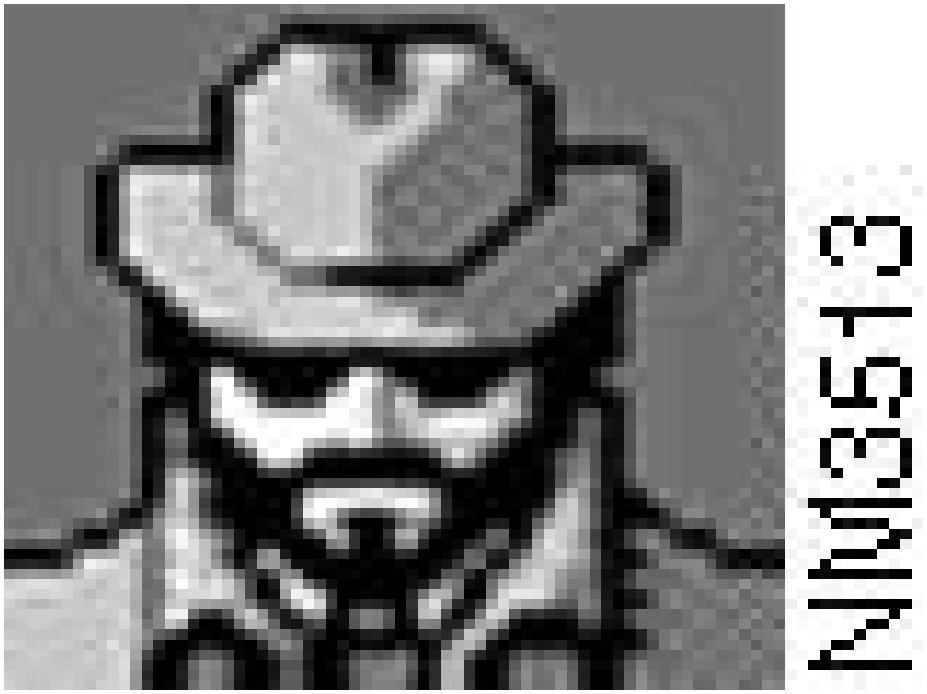
Table 7-4 Connection parameter for VBR.1 connection

Utilization (%)	1–100	100	1–100	MIN(1.2* SCR/PCR01, 100)
MCR (not editable)	same as PCR0+1	PCR0+1	same as PCR0+1	PCR0+1

ATM-ATM ABR.FS Connection

Figure 7-10 shows the parameters required to add a ABR.FS ATM connection. This section will only discuss the parameters that are different from the ones already discussed for CBR and VBR connections.

Figure 7-10 New ATM-ATM Connection Window for ABR.FS Connections



End-point parameters (Originating and Terminating) for ABR.FS connection

- Ingress Parameters:
  - Enable BCM—A toggle button to enable or disable generation of BCM cells when congestion is detected in the connection. The default is BCM disabled. Note that the BCM option will be grayed out for connections terminating on an AUSM card since it does not support BCM.

Connection parameters

- Rate parameter—Originating->Terminating and Terminating->Originating parameters:
  - MCR—A text field to enter the MCR (Minimum Cell Rate). Value range is 0 - port rate. Default value is 0.
  - ICR—A text field to enter the ICR (Initial Cell Rate). Value range is 0 - 24000 cells. Default value is PCR/10.
  - Rate Up—A text field for entering the ForeSight Rate Up value. Value range is 0 - 100%. Default value is 2.
  - Rate Down—A text field for entering the ForeSight Rate Down value. Value range is 0 to 100%. Default value is 87.
  - Rate Fast Down—A text field for entering the ForeSight Rate Fast Down value. Value range is 0 to 100%. Default value is 50.
  - ICR TO—A text field for entering the Initial Cell Rate (ICR) time-out. Value range is 1to 255 seconds. Default value is 10.
  - Min. Adjust Period—A text field for entering the ForeSight minimum adjustment value. Value range is 20 to 250 cells. Default value is 40.

Table 7-5 ASI and AUSM end-point parameter for ABR.FS connection

	ASI		AUSM	
Parameter (units)	**Range**	**Default**	**Range**	**Default**
PCR0+1 (cells)	10-port rate	10	10-port rate	port rate
CDVT0+1	1–250,000	10,000	1–250,000	10,000
SCR0+1 (cells)	10-port rate	10	10	port rate
MBS	1–24,000	1,000	1–5,000	10,000
PCR (not settable)	same as PCR0+1	PCR0+1	same as PCR0+1	PCR0+1
MCR (cells)	0-port rate	0	0-port rate	0

Table 7-6 Connection parameter for ABR.FS connection

	ASI/BNI		AUSM	
Parameter (units)	**Range**	**Default**	**Range**	**Default**
Utilization (%)	1–100	100	1–100	100
PCR (cells) not editable	10-port rate	PCR0+1	11–8000	PCR0+1
MCR (cells)	0–240,000	0	0-port rate	0
ICR (cells)	0–240,000	1	0-port rate	1
Rate Up (%)	1–100	2	NA	NA
Rate Down (%)	1–100	87	NA	NA
Rate Fast Down (%)	1–100	50	NA	NA
ICR TimeOut (secs)	1–255	10	NA	NA
Min Adjust Period (cells)	20–250	40	NA	NA

Figure 7-11 ATM-FR Connection Window for VBR Connections

New ATM-FR Connection

An ATM-FR connection is a connection that has an ATM end-point and a Frame Relay end-point. Only VCC connections are supported for ATM-FR connections. Valid service types for this type of connection are VBR and ABR.FS. Parameters for this connection are shown as per end-points.

Figure 7.5 shows the parameters required to add a FRSM to AUSM ABR.FS connection. FRSM end-points support both service interworking and network interworking options. In the case of FRP end-points only network interworking is possible.

The option menu for the end-point **Type** in both the originating and terminating end-point sections allow values of Frame Relay and ATM. The only restriction is that if ATM is specified in one end-point then Frame Relay must be specified in the other.

In Figure 7.6 an originating FRSM end-point and a terminating AUSM end-point are shown for a ABR.FS connection. The AUSM ABR.FS parameters are the same as those discussed earlier. The FRSM end-point supports the following additional parameters:

- FRSM End-point parameters:
- Interworking parameters
  - NIW/SIW—A radio box for selecting either Network Interworking (NIW) or Service Interworking (SIW). Default value is SIW.

- DE to CLP—An option menu for selecting the DE to CLP map value. Mutually exclusive choices are *Map CLP*, *Set CLP Zero*, and *Set CLP One*. *Set CLP Zero* and *Set CLP One* are sensitive (valid) only for NIW. Default value for NIW is *Set CLP Zero*.
- CLP to DE—An option menu for selecting the CLP to DE map value. Mutually exclusive choices are *Map DE*, *Set DE One*, *Set DE Zero*, and *Ignore CLP*. *Set DE One* and *Set DE Zero* are sensitive only for SIW. *Ignore CLP* is sensitive only for NIW. Default value for both SIW and NIW is *Map DE*.

New CE-CE Connection

A CE connection is one in which both originating and terminating end-point types are CESM. Figure 7-12 shows the parameters required to add a CE connection.

Figure 7-12 New CE-CE Connection Window for CE Connection

End-point parameters (Originating and Terminating) for CE Connection

- Ingress parameters
  - Max. Buf Size—A text field for entering the Maximum Buffer Size value. Value range is 1–65535. Default value is 6000 for T1 and 7000 for E1.
  - CDV RxT—A text field for entering the CDV RxT value. Value range is 1000–65535. Default value is 10,000.
  - Cell Loss Integration Period—A text field for entering the Cell Loss Integration Period. Value range is 1000–65535. Default value is 2500.
- The MCR will be set depending on the line being emulated (T1 or E1).